

A 3D perspective view of a computer keyboard. The keys are white with grey bases, arranged in a grid that recedes into the distance. A single key in the middle ground is highlighted in a vibrant red color, standing out from the rest of the keyboard. The background is a light, pale blue gradient.

VIDEO GAMES SPACES

IMAGE, PLAY,

AND STRUCTURE

IN 3D WORLDS

MICHAEL NITSCHÉ

Video Game Spaces

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**Image, Play, and Structure
in 3D Game Worlds**

Michael Nitsche

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Introduction

Interactive media and their most prominent and most diverse representatives, video games, have unsettled traditional media theory. They introduced the meta-medium computer into our living rooms, opening up a range of opportunities so unfamiliar and so diverse that we are still struggling with clear definitions. They changed the face of established media and media production and became a billion-dollar industry along the way. This industry, its fan base, and a range of noncommercial outlets constantly generate new artifacts to analyze and learn from. Games have developed from a niche market into a culturally and commercially significant media form. They may still be the new kid on the block, but they are rapidly growing up.

Games also have entered academia, where they have been investigated from a variety of perspectives. Occasionally, proponents of different approaches have engaged in a very lively debate. But we still have to explore much of the ever-expanding ground covered by the developing media. One challenge is the disproportion of a still-expanding media form and the often necessarily slower speed of generating the critical literature about it. Whereas the prophets of cyberspace were restricted to relatively few digital artifacts, often available to the selected few with access to high-tech research labs, the field of game studies today faces an overabundance of games to analyze. This body of work, in many regards, was necessary to support a wider analysis of new media.

It is incomprehensible that any single theory could do justice to a form as rich and vivid as the video game. The variety of these games calls for a diversity of analytical approaches: no one approach is sufficient, but many offer different yet interconnected perspectives. The more this analytical spectrum

grows in width and depth, the richer our picture of the video game becomes. This book tries to add its share to the spectrum. It will refer to the debates and key issues in games research but will shine a different light on them from a very specific angle—that of navigable three-dimensional virtual spaces. From this perspective, the book will revisit some models that have been examined before and suggest new ones that have yet to be debated.

3D game spaces allow players to crawl, jump, run, fly, and teleport into new worlds of unheard-of form and function. The game space we can experience, discover, and manipulate has become endless and at the same time more accessible than ever. Video game spaces stage our dreams and nightmares and they seem to get better at it every year. We will tour the landscape of video games in an effort to discover how the games work, how they are presented, how they can be read, why they are important, and how they can be improved.

Following this book's call for an interdisciplinary approach, its argument draws on many other disciplines such as literary studies, architecture, and cinema. Though comparative and interdisciplinary, it does not focus on the comparison of media as its main goal. Instead, the cross-referencing is the result of the topic. Spaces in video games can *only* be discussed through these references.

Like the 2D desktop metaphors that came before, the growing use of 3D graphics in video games shows signs of an evolutionary process. New and old game franchises adapt to the new “standard” or they struggle to survive. Whether it is Mario's step into 3D in *Super Mario 64* (Miyamoto 1996), the polygon worlds of the massively multiplayer online title *Meridian 59* (Sellers 1996), the 3D spaces in real-time strategy games such as *Ground Control* (Walfisz and Andersson 2000), or the jump from a top-down view in *Grand Theft Auto II* (Akliah, Conroy, and Hirst 1999) to the navigable 3D world of Liberty City in *Grand Theft Auto III* (Filshie et al. 2001), navigable 3D worlds have become a critical factor of game development. The market is dominated by 3D graphics in a way that suggests an overall transformation. This also affects the hardware of game systems. 3D graphics have shaped the hardware development of personal computers in the form of specialized graphic cards at least since the mid-1990s with the release of the NV1 and Voodoo 1 cards.

Often, 3D graphics have become a sine qua non in the modern commercial video game world—for better or worse. Yet the use of 3D graphics for its own sake cannot be the goal but rather a means to achieve a more complex task: the generation of fictional worlds in the player's imagination that grow from a comprehension of the 3D representations. Like written text or 2D graphics,

3D worlds have unique ways to support this imaginary work. This raises questions: How do game spaces achieve this effect? What are their key qualities? How can we improve their impact?

To answer, we have to turn to the player and the player's experience. Although this book will look at a variety of design issues and structures, its fundamental principle is to examine games in terms of the player experience. Space is an important element of this experience—and a very challenging one. The argument here is that game spaces evoke narratives because the player is making sense of them in order to engage with them. Through a comprehension of signs and interaction with them, the player generates new meaning. The elements that are implemented in the game world to assist in the comprehension will be called “evocative narrative elements,” because they do not contain a story themselves but trigger important parts of the narrative process in the player. These processes can lead to the generation of a form of narrative.

Such an approach has obvious parallels to semiotics. Video game worlds depend on representation and sign systems and the audiovisual presentation is an important section in this book. But the main argument will always return to the concept of space and spatial experience. Game spaces are approached not as foregrounded spectacles based on visual cues such as perspective and parallax but as presented spaces that are assigned an architectural quality. The discussion will concentrate on their spatial structures and how players can interact with them. In the games discussed, players want to engage not with the screen but with a fictional world these images bring to mind. This indicates the references to phenomenology that guide this investigation. Experience, comprehension, and spatial practice are phenomenological key elements that reappear throughout this discussion of virtual space. But how this experience is generated in game worlds is new. As much as we can learn from these approaches, there are fundamental differences in the way experience of space happens in nondigital settings and the necessarily mediated way we encounter game worlds.

The screen remains an important layer as it is mainly through the screen that the game worlds can unfold and become accessible to today's player. Video game worlds are navigable spaces that offer a wide range of interactions, but they are also spaces told to us using certain forms of presentation. This mediation is an important factor in the narrative processes connected to game worlds. It is in these presentations that we can find filters, which are constantly at work in 3D video games. Consequently, this book is structured in three main sections: one on the reappearing question of narrative and structure in game worlds, one on presentation, and one on the functionality of game spaces.

If this book has to be associated with a specific school or set of approaches to game research, it would be with a player-focused and experience-driven tier. This is a result of the topic at hand: the question of space. It is only logical that the reader will find chapters on identity and player positioning as well as on camera work and architectural theory. At the same time, this is a comparative survey driven by practical analyses of existent video games. Therefore, the reader will find references to numerous games and game worlds.

Ultimately, this book is an exploration of the new universe that opened up with the introduction of 3D graphics to games. This change has literally added a new dimension to video games that calls for a reorientation of games research and design and asks us to adjust our thinking about video games. Due to the interdisciplinary nature of this undertaking, the book most certainly has to miss a number of relevant sources and concepts but is intended to provide balanced arguments and detailed discussion.

1.1 Video, Game, and Space

Space has been a central issue for the study of digital media since the introduction of cyberspace (e.g., Benedikt 1991) and Multi-User Dungeons (MUDs) (e.g., Anders 1998). It has been a defining element of—at times opposing—studies in games research. Murray argues that spatiality is one of the core features of digital media (1997), Aarseth starts his discussion of Cybertexts with a look at labyrinths (1997), Ryan writes about narrative aspects of virtual spaces (2001b), and other studies of video games include often substantial chapters on space (e.g., Wolf 2002). Qvortrup edited a trilogy of books on different aspects of virtual spaces (2000, 2002; Madsen and Qvortrup 2002), and more recently von Borries, Walz, and Böttger published a large collection of short essays about spatiality in games and related issues (2007). Most of the work in this area has been discussed in numerous articles, theses, and conference papers. Jenkins's influential essays on game spaces build up from the mid-1990s (Fuller and Jenkins 1995) to a more rounded view almost a decade later (Jenkins 2005) and are only one example. This short list is by no means a full overview of the existing literature, but it shows that a study as presented in this book has to be clearly positioned to operate in relation to the other published works. This book touches on a range of established topics, introduces new interpretations of them, and suggests some new principles based on the element of game spaces. It connects various approaches to digital environments and, thus, has to clarify the field covered.

To avoid generalizations two premises will be applied. The games discussed

- have to be available on consumer hardware;
- and have to offer navigable 3D environments.

The restriction to available consumer products ties the study to a de facto analysis of existing worlds and serves as a reality check that prohibits any overly enthusiastic prophecies. It avoids the danger of promising unrealistic future wonders. Yet, where necessary, the argument in this book will refer to additional examples that are not commonly available. Video game spaces are, by and large, commercial products and thus limited by production costs and market considerations. In order to avoid a purely commercial perspective, this study also points to numerous research projects and art pieces. Notably, most of these projects do not depend on additional hardware or expensive systems, but are realized with the same technology that drives commercial video games. The author realized some of these projects himself during his work at the University of Cambridge and at the Georgia Institute of Technology. It is the philosophy of the Digital Media program at the School of Literature, Communication, and Culture at Georgia Tech to combine theory and analysis of digital media with practical experimentation. In this spirit, the book points to those kinds of experiments and combines them with discussions of commercial games.

The second restriction is that each game discussed has to feature an interactive and navigable 3D virtual world. In practice, this means that players can navigate through the world and interact with elements that are staged in it. One consequence of this definition is that these kind of worlds can offer different viewing angles to whatever events are realized in them. Clearly, this is the case for a very large selection of games but it does not cover all games. A range of titles have very limited spatial features or restrict the virtual environment to other representation forms. These titles will appear as references to clarify the differences and to provide a historic frame where necessary, but they are not at the heart of this study.

At the same time, this book will try to avoid a number of possible misconceptions. Navigable 3D worlds possess specific qualities and favor expressive techniques that differ from other formats. Perhaps we can blame the blanket term “multimedia” for an uncritical blending of different presentation formats into “virtual spaces.” MUDs, 2D worlds, interactive cinema, and 3D video games are too often treated as utilizing basically the same concept of

“virtual space.” That can be a misleading simplification. There are fundamental differences among a space described in a written text, a cinematic space, and an interactive navigable virtual world. They offer different forms of interactive experiences based on their specific qualities. Developing these differences will be one task ahead.

A different kind of mistake is found in some commercial approaches to virtual worlds. Here, space in video games serves too often as polygon-rich spectacle and “eye candy” that remains largely unused in the actual gameplay. It is time to revise this immature misconception and build new connections along the way for further debate.

The purpose of the two self-imposed restrictions is to keep the focus on the element of space in video games. Space—like time—is a principle at the heart of Western as well as Eastern philosophy. The study of space enters into numerous disciplines, so that we will be able to draw from disciplines as diverse as (in alphabetical order) architecture, computer science, film studies, game studies, media studies, narratology, philosophy, psychology, and many more. All of these disciplines contribute to the analysis of video game spaces but they cannot all be covered in one book. While this book can easily be accused of missing important disciplinary affinities, it will assemble relevant points to form a discussion of game spaces that can serve as basis for even more specific future work.

Such an interdisciplinary approach requires an understanding of different terminologies and a clear deployment of them in the new context. It will be one task to identify and adjust the different terminologies.

1.2 Structure, Presentation, and Functionality

Lefebvre breaks down social space into *spatial practice*, which secretes a certain society from another; *representations of space*, which is “conceptualized space, the space of scientists, planners, urbanists, technocratic subdividers and social engineers” (Lefebvre 1991, 38); and *representational space*, “space as directly lived through its associated images and symbols, and hence the space of ‘inhabitants’ and ‘users’” (ibid., 39). His division informs the approach of this book but the resulting structure grew more out of the ongoing analysis than from an upfront subscription to Lefebvre’s theory.

3D graphics open up means of expression to the computer that add a new dimension to their representation. The use of 3D navigable space changes the textual qualities of video games and distances them in some way from other interactive pieces that present their content in a less spatially defined manner. The first part of the book, on *Structure*, will look at how 3D space can reshape

the textual qualities of video games. It first considers what the new textual qualities of these game worlds are and offers definitions of the key terms “interaction” and “narrative” as two strongholds of games research and important factors in the way players make sense of the worlds presented to them. The main focus rests on the idea of understanding space and movement therein by ways of narrative comprehension. Narrative is seen as a form of understanding of the events a player causes, triggers, and encounters inside a video game space. From this vantage point, part I reframes key principles of narratology in the context of video game spaces before discussing quests as space-driven content structures for these narrative elements. *Presentation* is understood as the expressive element of video games. It grows from the necessary interpretation of the processed rules and data into some form the player can read. Presentation in current commercial video games uses predominantly audiovisual components. Thus, the second part of the book concentrates on the roles of the moving image and sound in video game spaces. The analysis looks more specifically into cinematic elements at work in video games with a focus on the construction and guided comprehension of virtual spaces. Part II will argue that different forms of presentation create a kind of narrative filter through which player interaction is framed into specific contexts. Important factors are the focalization through the narration and the guidance of the player’s reading.

Functionality refers to the interactive access and underlying rules determining what the player can do in the game space and what the space can do to adjust that. Part III looks at the elements that shape the development of the actions as they unfold in 3D worlds. Means of functionality are, for example, artificial intelligence (AI), complex rule systems, and interface design. These topics have been discussed in other works to far greater length. The aim here is to concentrate on the functionality of virtual 3D *spaces*. This leads to a focus on architectural principles and the question of a player’s positioning within the space. A line is drawn from various architectural principles to their actual use in video games and the player’s interaction with them. Experiential effects like immersion and presence are discussed to locate the player as active participant in the game world. We arrive at the idea of a social space, a place in video games. The argument closes with a reference back to narrative, for those social places are understood as narrative landscapes.

While part I differentiates 3D game spaces from other interactive media, parts II and III are more focused on the workings of video game spaces as such. Both are intrinsically different operational features of video games but are closely intertwined and interdependent. It will be argued that the level of presentation is a good example for the gradual development of video games

and has become part of the functionality and accessible to the player. Realizing the combination of presentation and functionality is a central goal and the underlying principle of this book. Historically, there seems to be a rift between the discussion of a game's audiovisual presentation and its functional interactive elements. But elements of spatial practice and mediation of space are always closely interconnected. Space—virtual or real—has to be encountered *and* interacted with. One has to explore the interaction and the media that present it. Any concentration on either presentation or functionality but not both would destroy the holistic principle of spatial experience. Thus, space forces us to interconnect and build new bridges between two central poles in game design and analysis.

1.3 What Space?

What is a video game space? The question has to be answered to avoid introducing a nebulous concept to the core of this argument. The difficulties in describing and limiting the term do not come as a surprise. The spatial is connected to and debated in literally every possible arena of human thinking. We cannot reduce such a holistic principle to any single frame or assume a single concept of “the space.” If space is such an all-embracing and hard-to-restrain phenomenon, the task is not to reduce the term itself but to build useful frameworks to approach the topic. One has to define the frame for the specific argument at hand and clarify its context. What are these spaces?

1.3.1 Simulating Theme Parks

Video game worlds are processed. They depend on algorithms and mathematical rules. These rules and processes follow certain models, which makes all game spaces simulations. Creating these worlds from rules is a form of simulation that follows a preconceived model. But that statement does not really help us to understand video game spaces as the player experiences them.

Thanks to the freedom of the mathematical models, the resulting worlds can be anything anywhere, which makes them remarkably indifferent and somewhat meaningless to start with. There is little given context or relevance present at the origin of these worlds, neither a history nor a physical constraint is given to the space itself. That is no problem from a mathematical vantage point but it makes the resulting virtual spaces almost inaccessible for players. One has to be a trained expert to deal with them. In order to project the necessary context into the game worlds and in order to make sense of them, the player depends on a legible presentation and meaningful functionality. Players can overcome the nonspecific origins of these spaces with the help

of a designer, who makes the game worlds accessible through interactive options and shapes their mediation in specific ways. The simulation of an atom bomb explosion in the Los Alamos National Laboratory and the explosion of the “anomalous materials” in *Half-Life* (The Half-Life Team 1998) have very different aims and work very differently as simulations. The same rings true for more “realistic” sim games like Sid Meier’s work or detailed driving games.

Yet, the same research labs that developed the atomic bombs famously provided the Petri dish for modern video games. The Brookhaven National Laboratory is part of the same Advanced Simulation and Computing program as, for example, the Los Alamos simulation unit. Both labs were founded to explore pressing research questions in the “hard” sciences. Nevertheless, about half a century ago, Brookhaven National Laboratory was the birthplace of the first documented video game: *Tennis for Two* (Higinbotham 1958), a prelude to *Pong*. The relationship between the armed forces and the game industry in the United States has been continuous ever since, inviting the term “military-entertainment complex” (Lenoir 2003). But tracing games only back to war simulations would be too simplistic.

Unlike the data-driven scientific simulation models, which aim to deliver reliable findings, accurate training conditions, and highly elaborate answers to very specific scientific problems, games are centered on the dramatic experience. They do not provide new knowledge through the execution of their code but instead present engaging questions. The necessary dramatization leads to a different kind of product that concentrates not on the data, but on the player.

America’s Army: Operations (Capps 2002) is a first-person shooter game developed for the U.S. Army and based on Epic’s *Unreal* engine. It was intended as a publicity and possible recruitment tool and seems to simulate an army boot camp, training missions, and real combat situations. Its rule system might copy military concepts but the way these rules get compromised through the spectacle of the game illustrates more the tendency of the military complex to embrace the game community than vice versa. In order to raise its appeal, *America’s Army* had to simplify and streamline the education of a soldier, emphasize the dramatic combat scenarios, and give up the total control over such training. It remains impossible to track the development of loyalty, duty, respect, selfless service, honor, integrity, and personal courage in a world with free chat options and the default “fire at will” setting. In addition, hacks for avoiding the game’s initial and more rigidly controlled training phase were available shortly after its release as players started to utilize their new toy and tweaked it to meet their demands. As a simulation

America's Army is of value mainly for tracking social behavior of gamers, not for military training purposes.

That is why *America's Army* serves as a political platform for Joseph DeLappe in his *dead-in-iraq* project, which he calls “a fleeting, online memorial” (DeLappe 2006). In this memorial, DeLappe logs into *America's Army* game sessions as a player named “dead-in-iraq” and uses the chat function to type in the names of U.S. soldiers who have died in Iraq. The underlying rule system remains active but its use is subverted. In the case of *America's Army*, such subversion is relatively easy because its title makes the game designer’s intention obvious. At the same time, the *America's Army* website also sells game-related action figures of decorated war heroes that represent a very different and less critical memorial of military operations. Political activism obviously works both ways.

But even if the game is based on more complex simulation models, the author of the game simulation still directs the simulation (Frasca 2003) and this influence cannot be free of an interpretative stand that includes ideological patterns (Bogost 2006). These differences between scientific simulations and games are not only on the level of the creator and code; they also reside on the side of the player. Players engage with video games not like scientists that operate a simulation program. They often suspend disbelief when activating a game and they usually lack an analytical distance to the data. Neither behavior is allowed in a scientific community. But what games provide is a reposition of the player into the “active” spot.

Through the loophole of virtual space we are able to reclaim the space of the action where we do not “look at” but actively visit the center of the action. When the player’s game avatar Gordon Freeman pushes the “anomalous material” into the particle beam deep inside the Black Mesa Research Facility in *Half-Life* and causes a chain reaction, he remains at the heart of the disaster and has to handle it. The player has to handle it, therefore, because the player handles Gordon. We are not analyzing the events as neutral onlookers but share the space with them and have to find our way out of the exploding chamber and the resulting mayhem. The game might stage the player in the role of a research scientist, like Gordon Freeman who is introduced as a virtual MIT graduate, but involvement with the unfolding events is not a scientific research project. It is a fast-paced action adventure. When Valve included a better physics model into *Half-Life 2*, this model is neither stable enough nor intended to be a solid representation of the real world, but most notably adds to the fighting variety in the game.

If games are simulations, then they are social playgrounds based on given rule sets, but even these set of rules are bound to crack under the pressure of

the player community. Play supports behavioral studies and the bending of the rules might produce the best results for a scientific simulation. But even here it is difficult to relate the player's actions back to real-world behavior. When Blizzard added the Zul'Gurub dungeon to the virtual world of Azeroth that is the setting for *World of Warcraft* (Pardo and Adham 2004), a special fighting move of an enemy at the end of one of the new quests introduced a virtual plague to the game world. The "virus" was transmitted over virtual pets as well as non-player characters and player-avatars. It spread quickly throughout the virtual world and led to the display of some real world behavior in the player community. In many ways, the resulting player behavior in the virtual world mirrored our behavior in the real world. Players did heal each other, for example, to contain the plague. Researchers have already experimented with multiplayer game worlds to teach and investigate disease control (Neulight and Kafai 2005). Yet again, direct transfer of the *World of Warcraft* plague event to real-world behavior is impossible, for on the one hand the game is limited in scope and on the other hand it differs in key criteria of human behavior. For example, infected *World of Warcraft* players could "teleport" into the middle of large cities and infect others on purpose, making containment impossible. Whoever "died" because of the virus was instantly reborn, which rendered the plague into an exciting in-game event instead of a terrible tragedy—it also allowed for a different playing behavior. Players could retaliate for being infected and the plague could turn into a subgame in the game.

Other multiplayer worlds host growing player-driven economies that can become highly complex. A number of problems have been caused by player behavior that concentrates on an optimized economical development. For example, players started "mining" in-game resources. They concentrated their whole game efforts on gathering valuables in the game world to sell them outside the game environment for cash. Others steal property or control over player-avatars. Others again exploit in-game bugs. Real-world fiscal issues, such as inflation, are also present in multiplayer game worlds. That is why CCP Games, which runs the online world *Eve Online*, has hired an in-game economist. He observes the development of the in-game economy to analyze and steer the impact of any changes. "After we opened up an area where there was more zydrine (an in-game mineral), we saw that price dropped. We did not announce that there was more explicitly, but in a matter of days the price had adjusted" (S. Hillis 2007).

All of these activities can have real financial impact as the virtual riches often translate into goods that can be sold for real money. Through their hard-cash value, these events have impact on the complex network of real

economics. In November 2006, Ailin Graef, a prominent figure in *Second Life*, who earns real money in virtual real estate deals and other in-game businesses, announced that she had acquired more than \$1 million through her online activities (anshechung.com 2006). The result of such activity is a gradual merging of two complex systems: the rule-driven and social networks of the game world and economic systems of the real world. It is here that the value of games as simulations becomes relevant, precisely because these worlds expand beyond their rule-driven origins—because they break their original simulation frame.

On the level of presentation and engagement, the simulation remains a technology that often gets hacked, tweaked, and compromised by players. A scientific simulation has to limit error margins and aim for certain neutrality with the highest possible data density to provide valuable outcomes. In contrast, games present their world in the most appealing way to attract players, insofar as they are simulations that dream of Hollywood, the Cirque du Soleil, TV commercials, the Taj Mahal, or Las Vegas. 3D graphics fuel that dream with a more and more elaborate form of presentation. While players in *Tennis for Two* looked on the playing ground, modern 3D worlds take us into the event space and onto the stage.

The *Back to the Future* ride was a main attraction of the Universal Studios entertainment park in Los Angeles in the mid-1990s. The LA ride had only opened in 1993 and combined flight simulation techniques and OMNIMAX cinema projection in an elaborate audiovisual and haptic spectacle. Instead of entering the airplane cockpit, visitors stepped into an oversized time-traveling DeLorean to race through different time periods in a great spectacle directed by Douglas Trumbull and driven by Industrial Light and Magic's effects. I had to wait about half an hour in a queue before I could even enter the building that housed the main attraction. To sweeten the bitter pill of waiting, the designers had multiple monitors and various movie-related paraphernalia installed along the queue. The closer the visitor came to the main attraction, the more one was surrounded by the fictional universe created in the *Back to the Future* movies. I found myself slowly fading into the *Back to the Future* universe that gradually replaced the "reality" of the theme park. When I finally reached the last waiting line that separated the visitors into smaller groups—each of them about to enter the pneumatic technical wonders of the ride itself—I was already inside the *Back to the Future* world, thanks to the surrounding artifacts and the expectations of the upcoming ride. Promising rumbling, muffled music, and the screams of visitors who were just experiencing the excitement on the other side of the doors, combined to produce an

overwhelming soundscape that was all part of the attraction. At that point, the ground started to shake. Alarm bells added to the overall excitement. Flashing lights went off on various corners. The doors sprang open and guides in uniforms hurried us along short hallways. We were about to experience the latest thrill ride on the planet—not quite.

We went right through the building and out on the other side. Only there, blinking at the bright sunlight, along with other confused visitors, did I slowly realize a minor earthquake had struck the park. What I had experienced as part of the attraction was, in fact, nature's disruption of it. The fictional disaster ride had become the very real scene of danger (albeit minor) and reality had played its tricks on the virtual. It had reclaimed its space.

Like game spaces, theme park attractions create an expertly directed sense of place and context in a fictional universe within the shortest possible time. The *Back to the Future* attraction did not consist solely of the main ride's few minutes' duration but also of the experience of waiting, the gradual drift into the unreal world of the attraction. Theme parks have been recognized by the game community as important references (Carson 2000) and discussed by a number of researchers (Darley 2000; Manovich 2001; Ndaliansis 2004). But there are fundamental differences between the two space types. The fictional space of a video game is an imagined space that lacks the physical and nature-dependent quality of theme parks. My earthquake experience could not have happened in the game version of the ride as presented in the GameCube video game *Universal Studios Theme Park Adventure* (Okuhara 2001). The game version of the *Back to the Future* attraction consists of a racing game featuring a chase—as does the theme park version—but the game uses it merely as an occasion to provide a whole range of other effects closer to an interactive racing game, far removed from the physicality of the original attraction. If a real quake would occur in the play space that houses the GameCube and my real body, no virtual ushers would hush me along polygonal hallways into virtual safety. The play space in the real Universal Studios and that in the video game differ widely in the way they connect the material world and the fictional one.

Another difference between rides and games grows out of these very real security issues for life and safety: theme park rides restrict exploration and interaction in order to control the balance of sensations. While players of 3D video games can explore vast virtual landscapes and learn how to master movement in 3D, theme park rides are by and large linear experiences with no or little interactive access. The player controls the hands and arms of the game character and “reaches” into the game world. In contrast, visitors to theme

park rides have little chance of interference with the optimized sensual spectacle they are “riding.” In the *Space Mountain* attraction in Disneyland Paris, visitors literally ride the bullet with no means of interaction whatsoever. The *Space Mountain* attraction offers an action-packed version of Jules Verne’s *Voyage dans la Lune* that explicitly asks the visitors to “keep your arms and hands inside the vehicle all time.” It is part of the concept that control in the peak moments of the attraction is not in the hands of the to-be-overwhelmed visitor but in those of the designer and engineer.

Theme park attractions that offer some form of meaningful interaction, like DisneyQuest’s *Pirates of the Caribbean: Battle for Buccaneer Gold* (Fitzgerald and Garlington 2001), turn more toward augmented reality (AR) games. Schell and Shochet argue that these mixed forms are neither games nor rides, but a new medium. They draw a line between theme park attraction and interactive virtual reality (VR) pieces (Schell and Shochet 2001). *Battle for Buccaneer Gold* is, in fact, an interactive piece modeled after the classic—and far more linear—Disneyland attraction, *Pirates of the Caribbean*. It is not a copy of the attraction but a more game-like in its own right installation. Like the film version, *Pirates of the Caribbean: The Curse of the Black Pearl* (Verbinski 2003), which was inspired by the same attraction, the VR installation is a different media format.

Finally, theme park attractions often use elaborate interfaces (Pausch et al. 1996; Mine 2003) that differ significantly from consumer-level video games and their interaction design. While any attraction in a theme park is situated in the middle of a corporate entertainment complex and visitors stream from one waiting line to the next, most of the video games discussed here run on home entertainment systems. That means they are played at home, in a familiar environment and with a very different interface predisposition. A theme park ride game such as *Sim Theme Park* (Harris, Leinfellner, and Nuttall 2000) includes a remediation of the ride experience, but mainly as a test of the player’s building skills. It ends up being a reward, much like a cutscene. Although this quotes the sensual spectacle of a real rollercoaster, it does so in the second instance through the eye of a virtual camera. In other titles such as the original *RollerCoaster Tycoon* (Sawyer 1999), the managing of the park is the sole core of the gameplay and we see again the game-based version of a simulation.

In order to discuss video game spaces, we need a method that allows us to distinguish between the various spaces: one precise enough to spawn the discussion and allow for clear differentiation between game spaces and other spaces; but also one that is scaleable enough to support more detailed critique of a game world.

1.3.2 Five Planes

Theorists have offered a range of approaches for analyzing video games. Each of these approaches defines a different set of layers or planes for understanding how games function (Konzack 2002; Montfort 2006). Any such layering has to be selective, because game studies are free to explore any game-related aspect and no model can provide all possible approaches upfront. The selection here was made with a view toward the experience of space. If “cyberspace is a representation of human beings’ space experience” (Qvortrup 2002, 23) and we continue such a phenomenological approach, then the system has to be able to answer to how we perceive the space, how we are positioned in relation to it, and the way we practice with this space. In order to address these issues, the model suggested here distinguishes between five main conceptual planes for the analysis of game spaces:

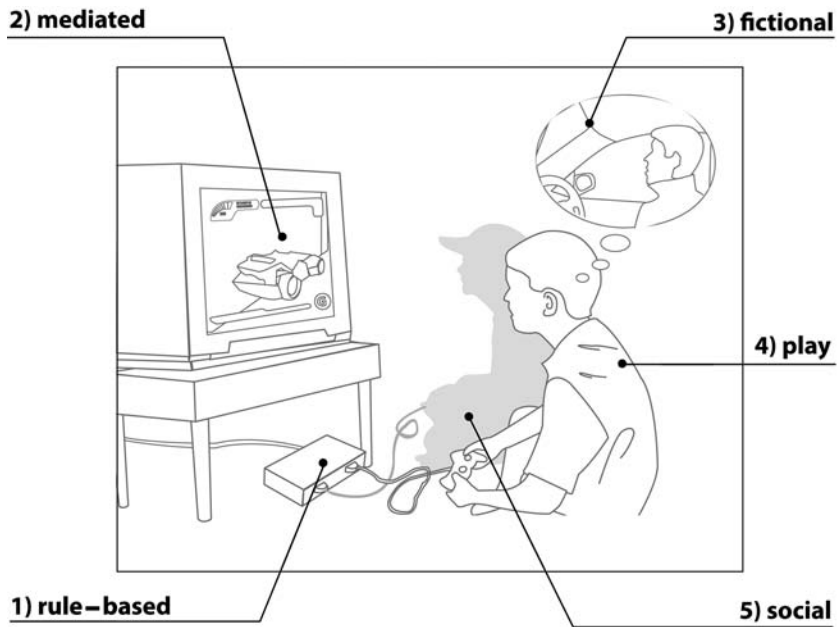


Figure 1.1 Five analytical planes

These planes are

1. *rule-based space* as defined by the mathematical rules that set, for example, physics, sounds, AI, and game-level architecture;

2. *mediated space* as defined by the presentation, which is the space of the image plane and the use of this image including the cinematic form of presentation;
3. *fictional space* that lives in the imagination, in other words, the space “imagined” by players from their comprehension of the available images;
4. *play space*, meaning space of the play, which includes the player and the video game hardware; and
5. *social space* defined by interaction with others, meaning the game space of other players affected (e.g., in a multiplayer title).

All five are conceptual planes that have their own qualities and define themselves through different elements. Yet in order to provide a fluent gaming experience, they all have to work in combination.

The *rule-based space* is defined by the code, the data, and hardware restrictions. It is the world of the functional restrictions that often mirror architectural structuring of video game spaces. This world is the basis for the *mediated space*, which consists of all the output the system can provide in order to present the rule-based game universe to the player. In the case of commercial video games this layer consists mainly of audiovisual and tactile output that provides a form of presentation. The player is confronted with this presentation and imagines a world from the provided information—the *fictional space*. Based on the fictional world players decide on actions to affect the game space. As long as players continue this engagement, they form a designated space in the physical world that includes the player and the gaming system—the *play space*. Finally, actions in the virtual world can affect the spaces of other players on the layer of *social space*. The planes offer an analytical framework and a perspective to approach the question of game spaces. At the same time, they are scaleable. Each plane could be broken down into more subsections for a finer granularity of analysis.

Others have suggested different but related categories for the understanding of space. Traces of those approaches remain in this game-space model. For example, Lefebvre distinguishes between “spatial practice” (closest to the rule-based space), “represented space” (closest to the mediated space), and representational space (which can be read as a combination of fictional, play, and social spaces toward an existential whole) (Lefebvre 2001). Others have chosen to focus on specific planes. Cinematic space has been discussed, for example, by Heath (1976) and Branigan (1992), whose findings mainly apply to the mediated space. Huinzinga suggested the concept of the “magic circle” that separates the world of the player from the not-playing surrounding world. Game studies have adopted some of these philosophies (e.g., L. N. Taylor

2002 for a reference to Lefebvre; Wolf 2002 for cinematic space; Salen and Zimmerman 2003 for Huizinga) and started to investigate possible relationships between separate planes (e.g., Juul 2005 for the relationship between rule-based and fictional space). Konzack (2002) and Montfort (2006) offer relating planes with a different focus and call for an analysis that interconnects them. Following such a layering, the argument here will try to make connections among all five of these spaces. None of these layers alone is enough to support a rich game world. That is why the argument will concentrate not on a separation between these layers but on their interconnections and overlaps to understand how they work in combination.

The two main forces that connect all layers are the two basic streams of presentation, which leads to comprehension and motivation, and functionality, which allows for interactive access and active game worlds. Functionality and presentation are the two forces that constantly interlink the different planes to bring game spaces to life. Instead of focusing on any single plane, we will look at the forces that interconnect them all. Ultimately, the division into five principal spaces for video games provides an orientation map from which the argument can embark. It also helps to concentrate on the given topic of game space.

1.3.3 Cyberspace and Text Spaces

One debate that provides insight in video game space concerns cyberspace. Discussing cyberspace within any scope is difficult. The term was derived from fiction and never totally shed the element of the fictitious. Although there are conceptual parallels, today's internet does not work or look like the original vision of cyberspace as William Gibson introduced it in 1984, yet the term seems to work as a reference to the web and numerous other digital formats. From the vantage point of space and spatial experience, the conflation of Gibson's cyberspace with the internet is questionable. Data space and navigable 3D space do not have to be the same; in fact, they rarely are. Data can be presented and processed in many different ways: as 2D webpages, mathematical models, descriptive text, or soundscapes, for example. It was only logical that the idea of a singular all-embracing cyberspace had to break down into smaller and more specific segments once virtual worlds became available en masse in video games. Once more specialized studies emerged, the idea of a singular information space gave way to countless smaller spaces. Today there is not one form of cyberspace.

When Dodge and Kitchin introduce their work on the mapping of cyberspace, they point out that "at present, cyberspace does not consist of one homogenous space; it is a myriad of rapidly expanding cyberspaces, each

providing a different form of digital interaction and communication” (2001, 1). Consequently, they include maps of continuous 3D worlds such as *Alpha-Worlds* as well as nodal networks of internet connections and website structures. Since then things have become even messier with user-generated worlds from *Counter-Strike* levels to *Second Life* and *Spore*.

However, the discussion of cyberspace offers a gateway for a lot of relevant work on virtual spaces that can serve as key references for video game spaces. Many of these arguments remain valuable but need a readjustment to the specifics of 3D video game worlds.

Benedikt’s seminal *Cyberspace, First Steps* (1991) contributes a range of perspectives to the new phenomenon. A whole body of work on cyberspace in the 1990s started the discussion of important issues: spiritual and theological (e.g., Heim 1993, 1998; Wertheim 2000), architectural (e.g., Novak 1996b; D. A. Campbell 1996), political (like Barlow’s “A Declaration of Independence of Cyberspace,” 1996), social (e.g., Rheingold 1991, 1993), cultural (e.g., Anders 1998), theatrical (e.g., Schrum 1999), and the questions of text, reader, and author that overlapped with some discussions in hypertext (e.g., Bolter 2001; Bolter and Grusin 1996). Most of these approaches will reappear and inform the discussion.

From the earliest days of video games, the medium was driven by graphic representation tied to rule-based processing. Titles such as *Spacewar!* (Graetz and Russell 1961) or *Tennis for Two*—arguably among the first video games in the sense that they could not have been realized outside the computer—featured graphics that became classics for later clones. Their representational form and interactive design did not derive from the literary textuality in a literal sense, but rather from spatial realization. In *Spacewar*, two player-controlled spaceships try to destroy each other with torpedoes, while avoiding collision with a central star that slowly pulls them into its gravity field. The gameplay grows from very basic rules that are implemented in very limited code (9 K), but it remains rich and variable for the player because these rules are realized in a virtual space that seems to open nearly endless permutations. For example, experienced players often used the gravity of the central star in their opening maneuver. They let themselves be pulled toward the star while shooting at the other spaceship. When performed by both players, the maneuver generated a shape not unlike the CBS logo—and thus was termed the “CBS opening” (Graetz 1981).

Unlike other opening moves, for example in chess or in the initial stages of a MUD, *Spacewar* simulates physical forces and an in-world timeframe that shape the game universe. Other nondigital formats, like pen and paper role-playing games, can try to simulate spatial behavior and map it onto their rule

systems, but it is difficult to match the precision of the computer in the way it handles spatial representation and functionality. Exact measurement and orientation can be difficult variables in pen and paper games that need significant simplification, for example in the form of simplified locations on the board. As a consequence, a lot of early video games emphasized their specific advantage in the use of space. For example, the first mass-produced commercial arcade game *Computer Space* (Bushnell and Dabney 1971) brought the simulation of the spaceflight to the foreground.

Once the game world expanded into 3D, the precision of the represented space became the basis of many more game formats. Collisions, spatial relations of bodies to each other, audiovisual representations of the environment, interaction with objects in the world and with the world itself—all necessarily highlight the spatial qualities of the game. How, then, do these qualities differ from other digital formats such as hypertext?

One way to approach video games is to look for the defining units of meaning within them. Looking for textual units mainly in text-driven games, Aarseth distinguishes between *scriptons* as “strings [of signs] as they appear to readers” and *textons* as “strings as they exist in the text” (1997, 62). “A scripton, then, is an unbroken sequence of one or more textons as they are projected by the text” (Aarseth 1994, 60). While Aarseth’s scriptons are the signs de facto delivered to the user, he distinguishes them from the Barthesian *lexia*. Barthes defines *lexia* as “brief, contiguous fragments . . . units of reading” (1974, 13) that refer more to Aarseth’s textons. In reference to this division, hypertext theorists divide hypertextual works into *lexias*—the individual data segment available at a certain node—and interconnecting links (e.g., Landow 1992). The overall structure of both can result in a possible rhizome of interconnected data. The hypertext piece *afternoon, a story* (Joyce 1987), for example, consists of 539 *lexia* and 950 links that form a complex network of interconnections. Interactive fiction, a relative to hypertext, can generate the text and thus might be less restrictive but still depends on descriptive textual segments (see, e.g., Montfort 2003). These can be arranged in various ways to form networks of *lexia* with different levels of complexity (Ryan 2001b). Yet none of these levels reaches the diverse range of a 3D space.

Breaking down a 3D game space in comparable units is nearly impossible. The options offered in a 3D navigable interactive game world include countless opportunities, possible positions, and directions. They cannot be separated into a definite number of textons. Rules and definitions might apply to each element, but the combination and dynamics between objects and worlds make such a breakdown impossible. Any movement in any direction at any point and any specific interaction at that point change the world’s

condition. Fighting games like the *Tekken*, *Virtua Fighter*, or *Dead or Alive* series depend on such an optimized combination of spatial control and specific fight moves. Any small change in a pattern might be the difference between glorious victory and miserable failure and will trigger a different move of the opponent. The interactive options as such are limited: spatial navigation, blocking, and attacking moves. Their realization is unique due to their use inside the game world and their dependency on the other character's actions. Instead of single nodes, game spaces put the emphasis on the forces between innumerable states and describe them in minute detail. Elements such as speed and direction are implemented in high detail and realized with great effect in the game world.

For the space creation in film, Chatman distinguishes between the "literal" story space in cinema, "that is, objects, dimensions and relations are analogous, at least two-dimensionally, to those in the real world" (1978, 96–97) and the "abstract" space in verbal narrative "requiring a reconstruction in the mind" (ibid.). In this regard, games are at least as "literal" as film. Virtual set design, lighting, visualization, and spatial sound design have become important ingredients in the development and experience of virtual worlds. In the context of video games, these options have changed the process of writing or reading a text into a process of designing or exploring a space. The creator becomes a "spacemaker" (Walser cited from Rheingold 1991, 286) or "narrative architect" (Jenkins 2004, 129) and the player an explorer and conqueror of space. In order to identify game spaces' specific features, the theorist as well as the practitioner must look at their spatiality that distinguishes them from literary pieces such as MUDs, which use spatial metaphors for orientation but consist of literary representation that offer different functionality and presentation.

Written texts have a spatial quality but their description of space differs significantly from the games discussed here. Moving through 3D audiovisual video game spaces is intrinsically different from interacting with a hypertext that uses conditional links to let the user create a path or reading through the available node elements. When clicking on a hypertext link, the user cannot predict the direction she will take. In fact, it is part of the pleasure of reading (navigating) a hypertext such as Joyce's *Twilight: A Symphony* (1996) to succumb to his expertise in the writing of each node and his careful arrangement of available text elements. Clicking on any hyperlink generates a unique reading path through the piece, but the reader's sense of control is limited because one cannot predict what the next move might be or where the link might lead.

Video game spaces are far more descriptive and graphically defined and have developed to a stage where they contain numerous spatial references and details. In fact, they can overwhelm us with these references. They can be so detailed that they trap us in their perfection and their presentation can become too flawless, too clean. They reach the uncanny valley where the distance between nature and virtual world become reemphasized by the gradual progress toward photorealistic rendering. The first demo I saw running on the PlayStation 2 presented a virtual forest that spread into sheer infinity—too pixel-perfect to look alive.

Ultimately, 3D game spaces remain part of the computer as media, and the basic textual machine that is responsible for the generation of the game text applies to them. Game spaces and other interactive media formats rely on the player to provide input and a system of rules that processes and reacts to this input. But game spaces differ from other interactive media formats in their textual units, the way they are generated by designers, and the way they are experienced by players.

Video game spaces share qualities with simulations, theme park rides, cyberspace, and hypertext worlds. In fact, they can be seen as simulators or a subsection of digital space, depending on the preferences of the analyst. But they offer different assemblies of the five defining spatial planes. These differences might be gradual—as seen in the game characteristics of the *Pirates of the Caribbean: Battle for Buccaneer Gold*—but traceable. The field of video game spaces as they are discussed here is defined by the two limitations previously outlined: only games that are available on consumer hardware, only games that offer navigable 3D environments. We will look at this field with the model of the five planes as our analytical framework interconnected by presentation and functionality. The book will proceed with a discussion of these spaces' qualities and operational forces.

I

Structure

The connection among the five analytical planes demands some form of *structure* for game spaces. Key terms such as “rules,” “narrative,” “interactivity,” and “space” all provide different methods to provide for this structure. The problem is that these terms have been overused and, occasionally, misused in games research. Thus, part I will begin with a clearer definition of how these terms are applied here. Once the individual elements of this framework are defined, we combine them and revisit various elements of narrative structure in game worlds to see how they can be applied to a game’s spatial qualities.

Games and Rules

There is a clear difference between the call for structure and rules that build the framework of the game on the one hand and the play and comprehension that form the gaming experience itself on the other. Players “play” with data and generate unique permutations, but the game’s code sets its own “rules” to structure the play. “Code is the law” (Mitchell 1999, 50). The computer becomes an embodiment of law and the programmer a “lawgiver” (Weizenbaum in Walker 1994, 230). This refers to the programmer as the author of the rule-based space. This plane, together with the emerging field of platform studies, is immensely important for the discussion of game spaces. Both what the interactor sees and what can be interacted with are processed by the code. But rules do not solely apply to the plane of the rule-based space and not every structural element of a game can be described on that level.

Alan Kay approached computers not as tools but as media, which often hide the operational logic of the code under a layer of representation that is easier for a non-expert user to understand (1990, 193). Video games are especially good examples of this media quality. The generation of experiential video game space is a direct offspring of this philosophy. Players of a video game do not look at the underlying code but at dynamically generated audio-visual and tactile results based on it. They look at the mediated plane and see the performance of the code. The code itself stays hidden behind elaborate virtual worlds and interfaces, and the only time one might encounter it is when an error crashes the program and a debug message points to certain lines of broken code. Players do not have to understand the logic of the code but of the mediated game world. “Beyond the fantasy, there are always the rules,” argues Turkle (1984, 83), but from the vantage point of a player’s experience,

it is the fictional plane where the player makes sense of the game, the space of personal interpretation and assessment.

Overwhelmingly, most game players stay on the level of the fantasy world when playing a video game. For example, they would not realize the fundamental logical difference between a version of *Pac-Man* (Iwatani 1980) running on the original Z80 microprocessor of the arcade board or a Java or C++ version of the game emulated on a Pentium processor under Windows. At the level of the code, both forms are completely different, but the player concentrates on the mediated plane and stays oblivious of the intricacies of object-oriented programming. The code level stays hidden unless it jumps into the foreground and causes unexpected behavior. In the case of *Pac-Man*, this refers to the final, 256th level that produces a virtually unplayable split-screen maze due to the hexadecimal-level counting in the code. The intricacies of the rule-based plane invade the mediated plane, and the game becomes virtually unplayable.

Another example of the code's reappearance in the fictional game world led to the "Furrer trick," named after Eric Furrer, who still holds the record in nonstop *Space Invaders* play at thirty-eight hours and thirty-seven minutes. Furrer discovered that if one blew up a certain alien ship with a specific shot (the twenty-second or fourteenth, depending on the state of the game) the



Figure 2.1 *Pac-Man*: the 256th board or "final level" (Wikipedia 2008)

game awarded more extra points than it did in other circumstances. Again, this discovery exceeds the fictional game world through inappropriate additional extra points awarded by the way the random number generator works. But while *Pac-Man*'s 256th board renders the game virtually unplayable beyond that final level, the Furrer trick at least does not interfere with the game flow and thus keeps the game universe intact. Power players like Furrer are “grokking” a game, as they take in every detail of its performance until they share its mathematical logic. However, they still lack access or understanding of the overall code. We still cannot tell *why* the Furrer trick works without looking at the code itself.

2.1 Players Making Rules

As game worlds become increasingly complex, their developers face more and more potential imbalances. Especially, massively multiplayer online role-playing games face the danger of some users exploiting certain bugs. In their “rules of conduct” concerning player interaction and activity in *Star Wars Galaxies: An Empire Divided* (Koster and Barnes 2003), Sony, the operator of this online world, explicitly forbids the use of bugs, including those “that grant the user unnatural or unintended benefits in-game” (SOE 2007, entry 15631). In that statement, the “lawgiver” acknowledges possible “unnatural or unintended” elements in the game world. These do not necessarily have to be game bugs that would crash the system. More often, they are loopholes opened up by specific player behavior and exploit an imbalance in the system, for example, to gain more virtual riches faster. Rules appear far more negotiable in an environment that acknowledges the existence of those imbalances. Players should be “fair” as the borderlines between socially accepted behavior and logical coded rules start to blur. In fact, designers of the earliest graphical multiplayer worlds had to learn that “*detailed central planning is impossible*” (Morningstar and Farmer 1991, 285; italics in original). In particular, interactions between players can take utterly unpredicted turns that simply cannot be predesigned and thus cannot be taken care of at code level. Even if the code seems solid, there are too many unpredictable variables at work.

In a much-discussed event during the beta test of the *Ultima Online* world (Koster, Delashmit, and Phillips 1997), the game series' creator, Richard Garriott, held an assembly where his über-avatar, Lord British, addressed a group of players. At that occasion, one player managed to kill Lord British, the mighty monarch of the fictional game world. The event illustrated unexpected social in-game behavior on the part of the player as well as Lord British's entourage, which retaliated immediately; it also was a glitch in the

running system. The avatar Lord British should have been “flagged” as indestructible, but lacked this attribute due to a server reboot shortly before the event. After the reboot, a system administrator forgot to reset this flag.

Code is fundamentally important but it is not the single operational law in game spaces where unexpected game behavior emerges from the playing community. Because games are played and player-modified, they are systems open for transgressive, emergent play.

Emergent play is a good example for the complexities of video game textuality. It deviates from the original game settings and can develop to highly advanced, self-defined communities and structures. Kücklich points toward game editor programs and avatar customization that go beyond the immediate game. He addresses the fundamental issue of rules and indicates a promising direction for a possible structuring of the outcome of the processes, but his argument that “we can then define the text as a set of rules that governs the fictional world of the game, whereas the game itself is merely an individual reading of this text” (2001, 51) does not cover the possible bending of the rule.

Game modification (MOD) communities represent one culture that often redefines game rules. They modify a game engine’s rules and assets to suit their special gaming interests and create new forms of games based on existing ones. The immensely successful *Half-Life* modification *Counter-Strike* adapted many of the original games’ features in its reshaping of the game. What the modifiers added was a new setting, a standoff between terrorists and counter-terrorists; new content, including uniforms, levels, weapons, and sounds; and new rules, mainly in the different setups of the conflict. Players generate their own game spaces and often change the basic rules of the underlying game depending on how accessible these rules are. But even within given game worlds, spatiality can support a change in the way players deal with the given rules.

The cinematic and visual rules on the mediated plane affect the player’s comprehension of the game space; this will be outlined at greater length in part II. Code alone is not sufficient to describe and define game spaces and the experiences they provide.

2.2 Space and Game Structures

3D space implies the option of a different turn at any moment, a new choice, or a different perspective that outweighs traditional nodes and links. The freedom of spatial practice supports a bending or redefinition of given goals. That is why Salen and Zimmerman use spatial metaphors to define “play” as

“free movement within a more rigid structure” (2003, 304). Players’ use of game spaces often represents exactly such bending and breaking of rules.

A number of game designers have recognized this factor and have taken it into account in their games—only to find out that players discover options even beyond the spatial liberties provided. One example is the first-person shooter *Deus Ex* (Spector 2000), which offers players not only a range of customizations for their character but also game worlds with multiple routes and spatial solutions. Yet innovative players discovered ways to expand even on this “possibility space.” The game allows players to set up mines on walls as traps for other characters. Instead of traps, the same objects can be used as stepping-stones forming improvised ladders, since players can stand on the small mine object and position mines along walls like ladders. The effect is based on a rule-driven behavior: your own mines do not explode when you are close to them; the mines consist of polygons large enough to provide ample collision control to operate as floor elements; finally, collision detection itself is a classic mathematical rule-based problem. At the same time, it results in new spatial behavior: players can overcome level obstacles and reach areas of the game space that were supposed to be off limit (Smith 2001).

Some game designers have embraced such rule bending and offer what might appear to be a bug as a conscious playable feature of the game space. Players of *Super Mario Bros.* (Miyamoto 1985) can break through the expected limitations of the game world, jump “outside” the frame of this sideward-scrolling jump-and-run classic, and discover additional features (see also Gingold 2003). As previously mentioned, a far more complex case are massively multiplayer online titles. The clearly marked boundaries—here of the game world—become negotiable within the game design. The surprises are still implemented via a rule system, but one that seems to have multiple layers at odds with each other. However, the game space remains the battered playground or envelope for the bent rules. Whatever structural model we want to suggest, it has to work in these conditions. The game world should encompass the countless options that grow out of emergent play and multiplayer conditions.

Defining Interaction

Interactive access is a defining feature of computer-based media—some argue *the* most important one—whereby interactive digital media differ from traditional media in allowing the interactor not only to perceive the virtual world but also to manipulate it. Crawford, a game designer and theorist, explains interaction as “a conversation: a cyclic process in which two actors alternately listen, think, and speak” (2000, 5), a dictum which can be rephrased as the elements of *input*, *process*, and *output*.

The player in a video game is both reader (of the computer’s output) and producer (via input) of events. For video game spaces, this means the player not only enters the game worlds but also changes them and their ingredients. These event-shaping features separate interactive access from the experience of traditional media and pushes interactive game worlds beyond Barthes’s *readerly* and *writerly* texts. To describe the new dynamics of texts in interactive digital media, Aarseth develops the concept of a “textual machine.” The textual process in his model depends on the fluent collaboration of the operator (the human user), the medium (the computer), and the exchanged verbal sign, to generate the (cyber) text (Aarseth 1997, 21). The model translates the technical elements—of input as it happens in the play space; output as presented in the mediated space; and process as it happens in the rule-driven space of the computer, but also in the fictional space of the player—into a textual definition, and offers an elegant description of the constant production of interactive text in video games.

A key element of this production is the participation of the user in digital media. Aarseth suggests the term “ergodic” to describe the difference between this kind of interaction and other kinds of engagement. Participation depends

on the interactors' physical activities—their movement in the physical world that causes some input effect in the virtual world. Aarseth stresses that during the interactive participation with the virtual world “the user will have effectuated a semiotic sequence, and this selective movement is a work of physical construction that the various concepts of ‘reading’ do not account for” (ibid., 1). Traditional media such as books, cinema, or radio do not offer this level of ergodic participation, and Aarseth clearly separates ergodic participation from any active reading. Examples of ergodic participation are a mouse click, pressing a key, or moving a joystick—any physical input that can be registered by the input devices and has an effect on the video game world—or more precisely: on the *rule-based space*. Such a definition distinguishes video games from basic forms of participatory shows (such as TV shows with audience participation or radio shows, where listeners can request their favorite tunes), as the interactor is affecting the actual text, and the kind, force, and direction of muscular activity can directly change the events at hand. Later, Aarseth extended his concept to argue that “ergodic phenomena are produced by some kind of cybernetic system, i.e., a machine (or a human) that operates as an information feedback loop, which will generate a different semiotic sequence each time it is engaged” (1999, 32–33). He allows for computers to talk to computers within the textual machine without any human interactor being involved and, consequently, has difficulties in assessing the result, which he rightly suspects would become a “nihilogue” (ibid., 40). When two machines talk to each other without any player involvement, the process of semiotic meaning building does not happen. There is no “semiotic sequence” for the player. Because there is no meaning assigned by any involved player, no fictional space is generated. Inclusion of a human interactor avoids such a nihilogue and will be at the heart of this argument.

To keep the communication model that is part of the interactive process intact, ergodic input has to come from the human user(s). Any chain of events in video games depends on the player as an integral part of the textual machine. This relates to and exceeds Barthes' arguments that the text can be “*experienced only in an activity of production*” (1977, 157; italics in original) as opposed to passively consumed work. Compared to a fixed work, such texts can function like a network, standing in a relationship to each other where “no vital ‘respect’ is due to the Text: it can be *broken* . . . it can be read without the guarantee of its father . . . It is not that the Author may not ‘come back’ in the Text, in his text, but he then does so as a ‘guest’” (ibid., 161; italics in original). In digital media, game designers—probably the most author-like personae—often find themselves facing this experience when returning to their finished product as visitors in their own creation. In order to return at

all, the game depends on an appropriate interface design that provides access to the virtual stage.

Interfaces are the gateways between player and game system. They have changed since the knob and button that controlled the racket in *Tennis for Two*, but a history leading up to the current generation of motion-detecting input devices is not the goal here. Some references to early interfaces will be made, but the argument grows from two points. The first deals with the element of abstraction and how it is applied, especially in interfaces for engaging with game spaces. The second is that spatiality implies a simultaneous interactive access on multiple layers. Based on these points, a brief summary closes this chapter in order to point toward the element of narrative as it might be implemented in the interface design.

Throughout, the focus remains on spatiality in video games and does not cover other elements of interface design in video games that might deal with other representational forms.

3.1 Interface Abstraction

We can distinguish between two interactions with virtual space to simplify the discussion: movement through space and specialized manipulation of elements within that space. Movement through space is a ubiquitous form of interaction in navigable virtual worlds but it remains an abstraction that differs significantly from movement in the real world. Specialized interactions can include access to objects within the world (e.g., picking up virtual objects in *Shenmue II* [Suzuki 2001]), access to the space itself (e.g., changing the virtual environment in *SimCity*), or interaction with other users (e.g., chatting in *Counter-Strike*), among others. On the level of these specialized interactions, most games use a “direct manipulation” approach. Players seem to directly affect objects in the virtual world. One click and Lara Croft operates the lever to open a door in *Tomb Raider* or Gordon Freeman swaps ammunition clips to reload his guns in *Half-Life*. This is an abstraction of the oldest form of human-computer interaction that saw programmers operating machines by physically adjusting knobs and dials.

Originally, knobs-and-dials interfaces were found, for example, in the analog machines built by Turing for the decoding of the Enigma code, 1939–1940. Coders interacted with the computer directly by affecting the hardware; knobs and dials allowed direct physical control over the logical processes. In graphical user interfaces, Walker observed a reference back to abstracted forms of this principle: “We’ve taken the computer user, who was initially in direct control of a dedicated computer, operating it by switches

and gazing at huge arrays of blinking lights, to greater and greater distances from the computer and direct interaction with it, then back again to contemplating a virtual control panel on a glowing screen filled with slide pots, radio buttons, meters, all providing direct and expressive control over what's going on inside the computer" (1994, 444).

The original knobs-and-dials principle worked with little or no level of abstraction, because no mediated space stood between the computer and its user. Later, the graphical user interface of the computer desktop introduced virtual "folders" and "recycle bins" that relate back to this low-level abstraction via the visual metaphor. Once the 2D plane extended into 3D space, these options needed to be situated in the newly forming game spaces. The same metaphors also exist in game worlds in the form of basic physical devices or images such as virtual levers, buttons, ammunition clips, or guns. Just as the desktop metaphor helped users to gain access to functions, so do these 3D objects provide access and heighten the level of immediacy *within* the virtual environment. Players seem to interact with an elevator call button within the game space of *Counter-Strike*—they do not type in a command line that would relocate them automatically or use a special key on the computer specialized for the elevator function. Like the user-avatar, these knobs and dials are part of one coherent spatial system and can be arranged within the virtual space in complex combinations.

Combining interface elements this way answers Laurel's call for interfaces and applications to be "*couched in the same context—namely, the context of the objects, actions, and tools of the representational world*" (1993, 127; italics in original). The game world becomes more compact as numerous interface objects are arranged into a coherent and accessible game space. The better this world operates, the less the players have to understand the code logic underneath, which was so crucial for the knobs-and-dials system. A game world does not ask interactors to understand the internal computer processes and the mathematical logic of the code. Players do not have to translate the metaphors and the 3D game spaces back into their technical generation, but instead are asked to connect them to a consistent fictional world.

The metaphor for a virtual gun is one way to exemplify this connection. Most virtual guns offer the option of firing them. Firing itself is usually triggered through a pressing or release of a button on the game controller. The signal calls a script to perform a certain change in the virtual game world, namely virtually firing the polygon gun. The virtual shot can have an immediate impact in the rule-based and mediated planes: a sound might be triggered, graphics for a virtual bullet impact might appear, computer-controlled

entities might react, the virtual gun might recoil and change the viewpoint, and a force-feedback system might simulate some physical reaction back into the game controller and back into the play space. These and other effects are artificially assembled elements of the gun-interface metaphor. They do not demand any consideration of the underlying code by the interactor and appear natural. But however natural the interface appears, firing a virtual gun is a complex interface task with a high level of abstraction during which the virtual object (the gun) and its effects are positioned in the virtual space and interact with it. Such a contextualization uses virtual representations of physical interfaces to simulate a coherent game universe. The gun is situated in the virtual world; the player has access to that gun; therefore the interaction connects the player better to the game space. The gun is experienced as a tool to perform on the virtual, like the knobs and dials were used before. But unlike the programmer of the 1940s, the twenty-first-century game player remains oblivious of the true operation of this access. The metaphor of the virtual gun is part of the fictional spatial world and provides a form of consistency within this world.

Once this consistency is guaranteed, these interface elements can create new effects that obviously break the real-world metaphor—like “movement” or “shooting”—but stay true to the virtual object. For example, the first-person shooting game series *Quake* (Carmack 1996) allows the use of a “rocket launcher” recoil introduced in *Marathon* (J. Jones 1994) to enhance the jump height of the user-avatar, exploiting it like a rocket-blast effect. Consistent with the gun interface-metaphor, the feature of a virtual high jump has been translated into an in-world effect not advisable in the physical world. Although the abstraction loosely refers to real-world effects, it ultimately supports a fictional world setting and combines the basic movement through virtual space with a specialized object interaction. These forms of combined, different interactions are typical for successful video games that allow for multiple levels of interactive access to the game space.

3.2 Structuring Multilayered Access

Any game world providing the rudimentary interactive features of navigation and specialized interaction with objects in the virtual space faces the challenge of dealing with at least two interactive features at the same time. The presentation section will later add another option: control of the virtual camera. Insofar as 3D virtual space calls for multiple simultaneous interactions, engagement with video game spaces is less of an “either/or” logic and more

of an “and” approach. This steps beyond a ping-pong interaction model where the ball of interactive access is either in the player’s or the system’s court. A pure sequential form of abstracted interactive access is possible, for example, in titles such as *Pong* (Bushnell 1972), which allow only extremely limited interactive access. However, this is rarely the case in real-time 3D game spaces, posing a special demand to video-game-space interface design.

Counter-Strike (Le and Cliffe 1999) stages multiple interactors in two opposing teams fighting their way through various virtual environments. In the middle of a fight, I can turn around to face an approaching enemy. This not only initiates a new spatial orientation, but also allows me while turning to shoot, throw grenades, change or reload the weapon of my avatar, activate a special item (e.g., a sniper view), duck/crouch/jump to avoid impact, call for help to friendly forces (controlled by other players), or taunt the enemy. In *Counter-Strike*, all these functions—examples of direct interactive access with immediate audiovisual feedback—are accessible at the same time through keyboard, mouse, and optional voice input. Most of these interactions depend on the avatar’s position in space. It makes a lot of difference for my actions whether I stand next to a door that can open or close, a virtual elevator, a pitfall that might stop the enemy, or behind some cover from possible attacks. The most important variables are the positions and maneuvers of other players around me in the game world. The *Counter-Strike* example illustrates some of the complexities of interface design for 3D video games spaces: because interactions can happen on various levels and with various other entities at the same time, interactive access exists in parallel. Players have to do more than one thing at any given moment; more than one kind of input might be necessary to succeed in the game.

Both multilayered access and spatial conditioning are attempts to mimic experienced real-world behavior through the abstractions of the game interface that enhance spatiality. They make interacting with 3D virtual spaces richer but also more challenging. Multilayered access and spatial referencing can demand so much attention that non-game-related information might be overpowered by the complexities of the virtual game world. The player has to perform not one but many tasks in the game space, which leaves even less opportunity to recognize the underlying mathematical logic. Players have to deal with and combine the foregrounded representations of the interfaces, the virtual guns, doors, environments, and avatars; they often lack the occasion to study them independently in more detail. Only once a level of mastery is accomplished they might start grokking the game. Space is a supporting factor to bind the player into the game universe and to situate actions, objects, and other players.

3.3 Game-Space Interfaces in Narrative Context

The set of rules that define the interactions cannot be “just like real life” (Laurel 1986, 100) but has to be distinctively selective. Limited as it might be, it offers powerful structural capabilities to the designer. “No playwright, no stage director, no emperor, however powerful, has ever exercised such absolute authority to arrange a stage or field of battle and to command such unswervingly dutiful actors or troops” (Weizenbaum in Walker 1994, 230). The “command” is always structured and it is the task of the designer to optimize the structure and to make access to the game space engaging and effective. A quarter-century ago, Malone already recognized that “fantasies can be very important in creating intrinsically motivating environments but that, unless the fantasies are carefully chosen to appeal to the target audience, they may actually make the environment less interesting rather than more” (1982, 64). Situating the player without careful consideration and *not* realizing and applying the methods correctly can be counterproductive.

The units at the basis of this structuring, the foundational building blocks, are the evocative narrative elements. Such elements can be anything and any situation encountered in a game world that is structured to support and possibly guide the player’s comprehension. The elements’ task is to improve a player’s experience and understanding of the game world. Players encounter and read these elements, comprehend the information in the context of a fictional world, and learn from them as they build contextual connections between elements. Much the same can be said about other interfaces, but unlike a help function or the task bar in a word processing program, the interface in video games is dramatic. This demands a reorientation of defining qualities given that implementing a dramatic interface might not necessarily lead to enhanced usability in the traditional sense. Federoff, for example, highlights a dominance of the satisfaction factor in games versus efficiency and effectiveness (2002, 5). Here we concentrate on one section of the interface: the depicted virtual space and the player’s interaction with it.

The abstraction of the interface into a video game space can be traced back to classic human-computer interface work. Shneiderman outlined three key criteria as quality standards for graphical direct manipulation:

1. continuous representation of the object of interest;
2. physical actions or labeled button presses instead of complex syntax; and
3. rapid incremental reversible operations whose impact on the object of interest is immediately visible. (Shneiderman in Laurel 1993, 8; also Shneiderman 1998, 229)

Shneiderman himself distinguishes between interface design for entertainment-driven titles and task-driven applications where “users focus on their task and may resent too many playful distractions” (1998, 197). Forms of interaction vary widely in game spaces and can establish their own goals that might oppose any immediate usability. Efficiency and satisfaction are important in games as well as in any other digital application, but they are applied differently. Because the list of possible interactions is endless, only a very basic distinction will be made between the spatial exploration of the game world and more specialized interaction with entities inside the game space. With this caveat in place, we can look into the necessary adjustments. Shneiderman’s three criteria for interface design have to be reassessed in reference to the new directive to engage the player, and in the light of video game spaces.

Continuous representation Most large-scale virtual spaces can be perceived only partially at any single moment. A complete representation of the whole space is not possible or necessary. Complete spatial representation in fact reduces the dramatic effect of spatial exploration because it removes elements of surprise and suspense that can be triggered by a gradual revealing of the game space. Dramatic moments and references such as suspense and surprise depend on the nonvisibility of certain elements within the game space. This mirrors the effect of building up suspense and anticipation in films through camera work that provides only partial revelations (e.g., *Blowup* directed by Antonioni [1966]). In a comparable way, a game world can exploit its intrinsic quality of gradually revealed space to stimulate curiosity. This proposes a *dramatic representation* that does not have to be continuous, but concise and focused. Part II of this book will investigate such a presentation in greater detail.

Physical actions/no complex syntax Navigation in space might be a natural, everyday interaction for human beings, but that does not make it less complex. In addition, multilayered access often adds more depth to navigation, raising the level of complexity further. The player receives assistance through the level of abstraction in game worlds as interfaces often refer to physical actions—following Shneiderman’s criteria. Nevertheless, while games might favor direct interaction with relatively simple single units, complexity between these units and interactions is an important factor in their interface design.

Although their basic syntax might seem simple, the range of specific conditions that can be generated through spatial conditioning of objects accumulates in a dynamic game space and leads to very complex situations. That is why many games start with an introduction of the interface to the player that explains the basic features step by step. Subsequent levels often increase the complexity and demand mastery of new and more difficult spatial conditions.

Mastering space is also a mastering of the elements within it. The *Metroid* series perfected the gradual improvement of the main characters' abilities that, in return, allow for more spatial exploration. This *comprehensible multilayered* interactive access enhances the complexity and depth of the game world as well its dramatic structure. It is engaging because the interconnections are so complex; the conditions of locked doors and necessary upgrades to the character in *Metroid* games are demanding but also motivating for players. Comprehensible multilayered access provides players with different interactive options at any given moment that can add to the way they encounter and engage with the virtual world.

Rapid actions Examples of rapid actions in game spaces are forms of direct access to objects and entities within them. For example, picking up an object in virtual space calls for a clear impact of the action on the specific object; shooting at an avatar nearby calls for some reaction in this character; steering the player-avatar calls for a direct translation of the input to the avatar's behavior. However, these forms of rapid actions in a game world can be restricted in order to implement dramatic key moments. An extreme example of narrative-defined interface limitations can be found in Galyean's *Dogmatic* installation at MIT, which uses a head-mounted display that offers free view control to the user. While the visual control is free, the progression of the predefined story is not. At one point in the event, once the user-avatar is hit by a virtual car "the system cuts to black and control is taken from the user. As it fades back in, the user is given back limited control. They are now only allowed to look within a limited space to the left, right, up, and down. . . . It is motivated by the story content" (Galyean 1995, 129). This authorial intervention mirrors the effect of an injury caused by the car accident through the interface. This point-of-view restriction is neither reversible nor incremental. In fact, the limitation of interactive access itself provides meaning for the fictional world. Many first-person shooter games from *Half-Life* to *Deus Ex* to *Breakdown* (Noguchi 2004) include this form of interface restriction.

At one point, the hero under my control in *Metal Gear Solid* (Kojima 1997), Solid Snake, faces an obviously disturbed and somewhat disturbing character named Psychomantis. This enemy claims to have special psychic powers and fighting him is a highlight in the game experience. During this fight sequence, I am presented with a cutscene in which Psychomantis directly addresses me—the player—mocking me about my saving habits as he checks the memory card of the PlayStation. It seems he not only fights my virtual hero, Solid Snake, but also the player in the play space. To win this fight, Psychomantis claims that he can move the controller in my hands using his psycho powers. When the cutscene ends and gameplay resumes, I realize that indeed

something is terribly wrong with the controls. The fight cannot be won using the usual in-game mechanics and interface set up that was used during the game so far. Instead I have to unplug the physical game controller from the default slot and plug into the second input slot in the PlayStation console. Only then control is regained and this specific opponent can be overcome. It is an extreme example of a narrative-evocative moment that manifests through an interface restriction. The restriction in this particular case even manages to reach into the physical play space as it requires a rewiring of the physical controller.

Precisely through its restriction of rapid access, this example improves the game's spatiality. It interconnects the different active planes: rule-based, mediated, play space, and fictional. The careful *timing and rhythm* of interactive access allows for narrative and dramatic shaping of the experience.

Game interfaces for 3D titles are shaped in reference to their spatial context. This factor can be used as a strong structuring device. *Dramatic representation*, *comprehensible multilayered access*, and *timing/rhythm* are steps in the direction of an engaging video-game-interface design based on the game's spatiality. An interface design following these criteria might not be advisable as the desktop of an operating system or for bank cash machines. We would not appreciate an obviously disturbed psychotic talking to us from the screen of an ATM machine and changing our pin code. But we do like that form of interaction in game worlds, especially when it supports their spatiality and our position in it. At the same time, Shneiderman's original criteria remain useful—indeed sometimes essential—for game spaces. That is why they were not replaced but widened. This widened spectrum already points to important components for effective virtual game spaces: fragmented space through complex presentation, variable interactive access through specialized and flexible interfaces, and interaction on multiple layers. Many of these components will reappear in more specific discussions on game space presentation and functionality.

Defining Narrative

The value of narrative and its use for analysis and critique of interactive digital media have been the point of much debate. The role of narrative in digital media is widely discussed, and the connection between the two is often attributed to Murray (1997), who envisioned new representations of stories to be told by the evolving interactive media. Her influential work was soon attacked by researchers focusing more exclusively on the ludic elements of video games. Concentrating further on the field of traditional game theory and aspects of computer games, some of these researchers argue that nonlinear interactive and narrative structures are mutually exclusive. Juul goes so far as to say that “the computer game is simply not a narrative medium” (1999, 1). Others argue that basic formal narrative theories such as Aristotle’s act structures, which have been applied to new media by researchers such as Laurel (1986), oppose users’ interactive control (Eskelinen 2001a). Restricting the user’s freedom in order to implement a predefined narrative structure is seen as an unnatural and patronizing counterforce from traditional media theory limiting the interactive features and specifics for video games. Thus, it has been argued that research in video games should concentrate on the dominating element of interaction.

Few narratologists position themselves as *opposed* to the ludic but rather more complementary to it, which renders the concept of narratologist difficult to define. Today, the debate sees a number of different approaches toward video games of which narrative and ludic are only two. Elements like “play” or “narrative” remain as attributes of the new media, but are assembled in a growing network of interconnected qualities that touch on social networks, gender, politics, ethics, communication, economy, and more. Ultimately, the

question is not whether video games are either one or the other, ludic or narrative. Thankfully, both concepts have been taken onboard the research as varying perspectives with specific strengths and weaknesses (e.g., Juul 2005).

That does not mean that one can take a term like “narrative” as granted. There is valid critique, especially on the use of the terminology (see also Frasca 2003; Mallon and Webb 2005). For our discussion of video game spaces, narrative is best understood as a form of comprehension that can be triggered and affected by the game world. This book considers this comprehension as necessary in order to make sense of the game space.

4.1 Narrative, Comprehension, Meaning, and Space

We are fairly familiar with our physical home environment: the television set, the favorite chair one sits on when playing games, the game controller, one’s physical needs such as the ordered pizza, the preferred beverage, the level of lighting and sound to optimize the game experience. In comparison, we are initially far less at home in the world of polygons, textures, and interfaces presented to us on the screen. Yet, the game asks us to master its levels, plan our actions in them, and execute them with a great level of skill. Players have to learn to read, use, and predict this world almost as if it were their home or private backyard.

Acclaimed game designer Sid Meier described a good game as “a series of interesting choices” (see Rollings and Morris 2004, 200). To keep this interest alive, video games can interconnect the choices and weave a net of relations among them, thereby creating a context for each single interaction. Raph Koster, another successful game designer, realized that a player has to learn this context to engage in the game world. For him, this aspect of learning is the single most important element in gaming because he sees it at the heart of player engagement and fun. Games, for Koster, are basically learning tools (2005, 36). At the same time, critics and scholars have developed the idea of games that teach on more than this basic level (e.g., Gee 2004; Johnson 2005).

I concur with the concept of player engagement via a learning process. But in comparison to simple pattern recognition, the more complex recognition and engagement theories promise more value for game spaces. In this case, the single unit to be recognized is the individual evocative narrative element. These evocative narrative elements support the necessary understanding of the game world and the player’s positioning in it. Not unlike Gee (2004), this points toward the situatedness of the player. A gamer has to first understand

a situation and his or her position in it before any action can be planned and executed in relation to it. It is here that narrative enters the picture. Following Bruner, *narrative* is understood as a dominating discourse form in human communication in general (1990, 77). Bruner's concept of the ingredients of narrative is rather applied and basic: stories consist of characters and their expectations of and behavior in the story world. This world is often interrupted by a breach that the characters have to deal with. These stories need to be narrated to come to life. Dealing with these factors has become such an everyday task, he argues, that "we are so adept at narrative that it seems almost as natural as language itself" (Bruner 2002, 3). This idea of narrative as comprehension that helps to make sense of actions will be adapted here. Narrative structures are woven into our comprehension of almost any situation—game or not. This kind of narrative is not a fixed solution or an end state of any event, "it is deeply about the plight, about the road rather than about the inn to which it leads" (*ibid.*, 20). This road exists in the mind of the player and is constantly fueled by stimulants from the game. Stimulated by the game, the player weaves the connections, creates a narrative context. This mirrors the concept of ideation formulated by reception theorists like Wolfgang Iser. Iser approaches the "text as event" (1978) that sees readers filling in gaps through their imagination and creativity. The structure of a video game might foreshadow this ideation through the design of the evocative narrative elements, but it comes to life only through the work of the player. The resulting story, Bruner's "road," exists only in the mind's eye.

For game spaces, this assembled image is a necessary part of meaningful interaction. It complements the ludic elements of a 3D game. A fundamental function of narrative, as it is understood here, is that of providing "a way of comprehending space, time, and causality" (Branigan 1992, 36). As the interface discussion showed, conditions can become more complex and multilayered when players engage in 3D game spaces. Narrative elements can create a supportive context for the necessary interpretation and prevent a chaotic and meaningless explosion of possibilities. The problem is that such an understanding of narrative is almost all-inclusive and thereby close to useless. The way it can be applied to video games needs some clarification.

New media scholars have pushed the active role of the player/reader before (e.g., Aarseth 1997; Ryan 2001a, b; Kücklich 2001) but did so primarily in the context of MUDs and hypertextual pieces. The element of 3D navigable space adds a different mechanism to the readers' involvement. While we can consider game worlds as a format of video games just like MUDs, players read and interact with them in very different ways than they do with descriptive text. Game worlds situate the players in a different relation to the evocative

elements. As we engage in the game space we start that discourse for which Bruner has identified narrative as a main method.

Narrative is a way for the player to make sense of the in-game situation. The main process happens in the player, but it can be evoked and directed by evocative narrative elements, formed by encounters or situations in the game that prime some form of comprehension. Evocative elements are included in virtual environments to improve the meaning-building process of the player. The elements are not “stories” but suggestive markings. They are clustered in certain ways and aimed to trigger reactions in players in order to help them to create their own interpretations. One consequence of such a model is that the stories are never in the piece itself but in the mind of the player.

4.2 More than One Story

Evocative narrative elements encourage players to project meaning onto events, objects, and spaces in game worlds. They help to infuse significance. Their value is not realized on the level of the element itself but in the way players read and connect them. Creating these connections, players can form narratives that refer to the game world. If this meaning assignment becomes very strong, the virtual items themselves can leave the rule-based space, fictional space, social space, and even the play space.

If a player plays alongside a computer-controlled character for a long time—as in *Wing Commander IV: The Price of Freedom* (Hartigan et al. 1996)—only to discover that this character is a traitor to what seemed to be the shared cause, the situation can evoke the sense of betrayal and loss. When a long-standing virtual friend “dies” such as Floyd the robot in *Planetfall* (Meretzky 1983) and Tassadar in *StarCraft* (Phinney and Metzen 1998), and the much talked-about death of Aeris in *Final Fantasy VII* (Kitase and Narita 1997), players can report the sense of loss as tangible. But assignments do not have to be as one-directional. One and the same element can be arranged into different constructs encouraging different responses.

At the end of *Deus Ex*, I am presented with three choices leading to three different endings, each following a specific philosophy with its ethical qualities and flaws. This selection might seem minimal but I make the decision based on a multihour-playing experience during which I have customized my virtual hero as well as developed his alignments with the various factions at work. Answering the questions in the end is only the conclusion of an ongoing debate that consistently crossed my path as I played the game. Value is attached through a context and history that grows from a network of actions I share with the game world through the main character. Some games try to

establish such a network very early on. The first minutes of *Max Payne* (Järvillehto and Stein 2001) stage me as the virtual action hero Max Payne, who comes home to discover that he (and I) cannot stop a group of computer-controlled virtual thugs from killing Payne's young family in the first game level. The shock is a strong incentive to continue the game *Max Payne* and a powerful evocative event.

The aim of narrative elements like these is not to tell a linear story, but to provide evocative means for the interactor to comprehend the virtual space and the events within it, and generate context and significance in order to make the space and the experience of it more meaningful. While the reader of a novel is limited to the given text, the player of a game interacts with these evocative elements, cocreates them, and changes them. Whatever manifests itself in the shape of this comprehension is of a unique nature. A game's "story" is not a singular entity. This development is covered further in the research on hypertext and its predecessors (e.g., Montfort 2003). The difference in video game spaces is the spatial mechanics of the narrative elements and the interactive access to them.

Uncovering the space, its drama, and meaning goes hand in hand with the gradual comprehension of events and objects into narrative context. This leads to the close interconnection of space and narrative. Narrative elements help to make the space meaningful and space helps to situate these elements. The most important element that needs positioning is the player. This effect has parallels in literary studies and narratology in discussions of voice and perspective. How do these and other traditional key elements of narratology apply to game worlds? Starting from the concept of the final assembly of narrative in the user's mind, a set of tools can be adapted from narratology for the description of the process of how the evocative elements interact with the user, how they are read, and where user interaction and predefined elements overlap.

Combining Interaction and Narrative

Some years ago, I worked on a project at Sony's game development studios in Cambridge with a friend from a renowned British film school. He had not been playing games for years. But the studio offered an enormous library of PlayStation games, constantly updated and available to employees free of charge. The temptation was overwhelming and, after a few days, he had purchased his own PlayStation and spent a considerable amount of time playing at home, during lunch breaks, and whenever there was an opportunity. Gaming fever had struck, and within a week all the symptoms of a dedicated gamer were apparent. His favorite was *Silent Hill* (Kitao and Gallo 1999). *Silent Hill* stages its survival horror gameplay in a distinctive narrative setting. Sequels have refined the original formula with varying degrees of success. But instead of analyzing primarily the structuralist elements of this game (e.g., character or setting), I was more intrigued by my friend's growing relationship with the game world. Like many other games, *Silent Hill* takes the player into ever-deeper pits of horror. My friend continuously got lost in the lower regions of the game space that seem to be designed in such a way as to turn the space into a state of an ongoing nightmare. In fact, the last section of the game is staged in a "Nowhere" world, where spatial orientation in endless repeating rows of blood-stained hallways becomes a maze with seemingly no exit. In such a disorienting "otherworld," any assisting fixation through evocative narrative elements is only too welcome. Helpful non-player characters provide some of these fixations. At one point of the game, my friend steered his game hero into yet another ghostly blood-smeared cellar. But in this particular room and at this moment in the game, he had to witness how one of the formerly friendly game-controlled characters turned into a zombie creature herself. The

transformation itself was presented as a linear, noninteractive cutscene ending with the player-avatar fleeing the scene and standing once again outside the room. Left outside, control was given back to the player. There was an expression of horror not only in the hero's eyes but also in those of my friend. He looked at me, shocked, and confessed that he really would rather not kill this particular person—even if she were a deadly zombie now. What to do? In fact, there is no choice and this character cannot be “saved.” The choice was without consequence because there simply was no alternate game state. However, my friend's connection to the character went far beyond a replaceable game token—it grew out of the cognitive work invested into the game.

This demonstrates how game events can be interpreted into a personal meaningful layer. The event located in the game world had become so significant that it triggered a response that moved beyond the play space and became quite literally a turning point for the player, one so strong that he turned to a non-player, in this case me, to discuss the matter at hand. This event created a social space for the game even after the game shut down, showing the power of evocative narrative elements and the dilemmas they can create for us when they are encountered effectively in a video game world's spatiotemporal universe. The evocative narrative elements can connect different spheres like the play, social, and rule-based ones and start to weave a network among them. A number of established and debated principles will be revisited to investigate this network, with 3D navigable space providing a new perspective.

5.1 Story and Plot

In discussing narrative, Russian formalists distinguished between *fabula* and *sjuzhet*—the events as they happen one by one (*fabula*) versus the order and manner of their presentation (*sjuzhet*). Many researchers have adopted this basic designation, some equate *fabula* with story and *sjuzhet* with plot, among them Jefferson (1986, 39) with focus on literary overview, Chatman (1990, 9) on film, and Aarseth (1997, 112) on cybertext. Others interpret *fabula* as plot rather than story (Bruner 1990, 43); or read *sjuzhet* as story and *fabula* as events (Brooks referring to Ricoeur in Brooks 1984, 14), which means that the range of interpretations of the original terms has become so great as to be potentially confusing in the present context.

Reconciling the usages of the terminology in any final way is outside the scope of this work. In the context of game spaces, the distinction between *fabula* and *sjuzhet*—as proposed by the Russian formalists before passing through the mill of structuralism, poststructuralism, deconstruction, and

semiotics—seems appropriate. In the analysis that follows, *fabula* is used to designate the events and their order, while *sjuzet* refers to the order and manner of their presentation. The terms of story and plot are not directly equated with either.

Consequently, the *fabula* of video games consists of the actual events as they are cocreated by interactors during the textual generation process. In other words, the *fabula* in video games consists of the events *as they happen* during run-time, not *as they should happen* as provided by the work. The *fabula* of the video game *Myst* (Miller and Miller 1993), for example, is not the underlying background story of a conflict between two brothers and their father, but the player's uncovering of it. Any development of the *fabula* is positioned within the responsibility of the user's interaction that is itself informed by the evocative narrative elements of the title. A *fabula* is only processed when the player engages.

The *sjuzet* is present in 3D video games through the work of the presentation. For current 3D spaces, the presentation of events in the game space mainly happens through audiovisual as well as limited tactile output. The *sjuzet* of *Max Payne* can structure, for example, flashbacks, replays, or dream interludes.

As real-time environments represent the events as they happen in run-time, *fabula* and *sjuzet* are closely intertwined. Events are created on the level of the *fabula* and, at the same time, they are presented and interpreted in the *sjuzet* and told back to the player. *Sjuzet* and *fabula* are tied together on the level of interaction and immediate audiovisual presentation. In this combination, *sjuzet* has the option to position events in the fictional game universe and *fabula* has the power to realize the event as such. This interpretation of interconnected, yet separate levels of *sjuzet* and *fabula* allows the investigation into the narrative layers of video game spaces. It demands a closer investigation of camera work, for example, as the virtual camera provides the main filter through which the *sjuzet* is presented to the player.

The concept of plot is useful in the context of video games for a description of the comprehension of the *fabula* by the interactor. Barthes clearly makes the distinction: "To interpret a text is not to give it a (more or less justified, more or less free) meaning, but on the contrary to appreciate what *plural* constitutes it" (1974, 5; italics in original). In video games, this "plural" has to be concretized, at least to some extent, as the interactor is asked to draw conclusions and further interact based on these conclusions. Players have to interact in some way with the fictional world, which excludes a passive dwelling in a polysemic text. Continuous passivity lacks the necessary ergodic input and usually leads to the end of the game as interactive text. A video game

that demands meaningful action in a 3D world from its players also demands a plot creation from them.

In contrast to the reader, who follows the events in a book, the player in a video game is obliged to act in order to keep the textual machine working. Agency is not only an option but also a demand. It can even turn into a curse, for example, in any moral dilemma that a video game might pose to the interactor and that demands a dubious decision. This was the dilemma my *Silent Hill*-playing colleague encountered. The necessity to act can enforce meaning assessment and situates the plot into this assessment.

Fortunately, some literary scholars have already developed the concept of plot for traditional media. Brooks situates the plot in between *sjuzhet* and *fabula*: “Plot could be thought of as the interpretive activity elicited by the distinction between *sjuzhet* and *fabula*, the way we use the one against the other” (1984, 13). Likewise, Iser emphasizes the “convergence of text and reader” where the reader interacts with the plot and the text merely provides the rules for this interaction (1976, 176). Plot is happening on the side of the player—in the fictional space. Plot is neither the factual order of events nor their presentation, but the order and connections between events as understood by the reader. Plot is the result of a cognitive process.

This relocation of the plot answers some dilemmas posted by researchers of interactive media. Locating the plot within the game world, Laurel claims that it would be too much to expect any interactor to have to fulfill his embodiment in the fictional world and to create a unique plot at the same time. “He [= the user] cannot lose himself in the experience of creating a character because he must keep an eye on the development of the plot; he cannot enjoy the act of playwriting because he is constantly distracted by the requirements of acting” (1986, 29). Referring to Aristotle, she equates playwriting (work creation) with the plot creation in an attempt to situate all narrative elements within the work itself. The result is a dilemma of “plot versus interactivity”—one that shines through a number of arguments in game studies.

Indeed, there are games that are less plot-driven than others. *Tetris* (Pajitnov, Pavlovsky, and Gerasimov 1985) offers few means for plot generation. The world in *Tetris* is dominated by the rule-driven plane. Its mediated space is reduced to a 2D representation; the fictional space is forced to deal with rather abstract geometrical tasks and, if successful, mirrors the rule-based plane. This is by no means a critique of *Tetris*'s game qualities but of its spatial ones. In fact, experiments question the value of *Tetris* as a training tool for spatial rotation (Sims and Mayer 2002). The original *Tetris* is a game with an almost exclusive focus on the rule-based plane. A number of 3D *Tetris* versions are

available, which established a far more complex mediated space that includes its own camera controls and visualization rules; multiplayer versions of *Tetris* can offer chat options and cross connections between the different player performances, which exceed the sheer rule-defined game space and incorporate strategies applied by the other players as well as extend the social space. These titles operate on planes, and open up gameplay to a more complex and selective comprehension. The narrative level of the original *Tetris* is limited because its spatial qualities are limited.

In 3D game worlds, any specific route the interactor might use to navigate through the game world of *Zelda's* Hyrule is a negotiation with the structure and the rules coded into the environment; any discovery of a missing puzzle item in Lara Croft's *Tomb Raider* levels, the creation of a city in *SimCity*, the troop maneuver in *Warcraft*, or the chosen path in *Deus Ex* depend on spatial conditions, exploration, and comprehension. Based on the growth of the text from this spatial freedom, we have to reverse Laurel's argument. In a 3D video game, one has to write one's own play in space by acting in it. Events need to be defined and realized in their spatiotemporal setting by the player. Applying Brooks and Iser's theories, the comprehension of this personal experience is seen as the plot. Because the plot, then, is an active interpretation of the fictional world, we can make the argument that a user's immersion in a video game space is enhanced, not broken, through the cognitive processes that lead to the creation of individual plots and significant spaces. It also becomes clear that the plot grows from the play and is part of the fictional plane.

Games that do not focus on an imagined world, such as the original *Tetris*, do not need such a plot. In other titles, the very same interactive event can generate different plots for different interactors. Because the assessment is a highly individualized operation and depends on the circumstances of each player, the results can vary widely. What might appear to be a successful "fragfest" for one group of online players of *Counter-Strike* will be remembered as a horrible day of defeat by their opponents. The decision-making moment in the dungeons of *Silent Hill* might be highly engaging for some players, but a mere opportunity for more virtual killing for others. Plot resides in the fictional plane and, although it is evoked by the game experience, its formation is subject to personal taste, physical condition, personal interest, social sphere—in short, to any element shaping the player's personality in the real world. Because it is living in the fictional space and is highly player-dependent, it can grow to unexpected results. Players can imagine a greater space than actually exists, as Lyle Rains remembers in regard to the Atari game *Battlezone* (Hoff 1980): "One letter came in from a *Battlezone* fan who

said that a friend of his had told him that if you drove far enough you finally got to the volcano, and if you drove over the top of the volcano, you could go down into the crater. And he said that inside the crater there was a castle, and that you could go inside and explore the castle. Of course, none of this was true. It was a great little story to get from a fan. Who knows, we may yet do a volcano with a castle in it” (Atari Library n.d.).

Plot is the basis from which a retelling of a game experience is created. This retelling is outside the framework of the game. That is why it cannot be directly included in this framework of narrative features that operate in-game but it is a sign of the evocative narrative elements at work. We can compare it to a retelling of a holiday stay or a cinema visit.

5.2 Function and Plot

A formalist’s view of the plot would assume that it is constituted by certain fixed elements. In traditional linear media, such as folktales, film, or books, only the storyteller has the privilege of arranging a certain variety of what Propp terms “functions” (1968) so as to create a comprehensible work telling the story, whereby: “*Function is understood as an act of a character, defined from the point of view of its significance in the unfolding intrigue of the story*” (ibid., 21; italics in original). Propp developed thirty-one functions from an analysis of Russian folktales. He argues that these functions can be arranged following mathematical rules to generate the structure of each of the folktales in question.

A number of analyses of interactive pieces have applied Propp’s method. The first Ph.D. thesis (Buckles 1985) on video games as texts referred to Propp in an analysis of the text-adventure *Adventure* (Crowther and Woods 1976). Researchers in the fields of artificial intelligence and interactive fiction were also inspired by Propp’s model (from Meehan 1976 to Weyhrauch 1997 to Szilas 1999 and Fairclough and Cunningham 2003).

But there are a lot of problems with a too-literal adaptation of the model. Many players opt out of any given story and instead engage in less goal-driven communicative patterns or sheer spatial exploration. The player-centered approach proposed here identified plot in 3D video games as a form of users’ comprehension—a shift from Propp’s model that does not apply this kind of player-focused approach. But his postulate is clearly of value for the rule-driven space in game worlds, and in the analysis of narrative elements within it. Propp’s principles have value as a guideline and analytical tool but his results have to be adjusted to the new setting of interactive digital media in order to work for video games.

A *function* in the Proppian sense is understood as a function *for* something—namely the progress of the story but because we have placed the story in the mental eye of the player, the definition and operation of functions in games has to shift in the world of video game spaces. Interactive access applies functions as “meaningful choices” or “activities” that are available in the fictional world. In the context of interactivity, a hero’s functions are regarded as active, verbal entities available to the player. They empower the player to do—or do not. Crawford speaks of “verbs,” “nouns,” and “adjectives” that are provided by the designer of a game. Crawford calls specifically for verbs to identify what “you want your user to be able to accomplish with your program” (2002, 62). It is up to the player to call the individual functions into existence through ergodic participation. Realizing a verb or interactive event assembles the vocabulary into the unique and personal virtual performance of the player. It is a creative act, which can only happen in the textual process during the run-time execution of the underlying code. One important difference is that Crawford does not force a limited matrix of verbs onto a player.

Notably, the functions or verbs in a video game are not restricted to the format of Russian folktales, which is the specific area of research of Propp’s investigation. Instead, they might concentrate on entirely different narrative forms, which have not been accounted for by Propp. Any postmodern, multiperspective, and open-ended text would be difficult to constrain to Propp’s concepts. Yet any navigable 3D space can support those forms.

In a game, functions might be provided by the designer but are player-dependent in their execution. They do not arrange themselves into a given formula but are arranged by the player through their execution in the game world. Lara Croft, game icon and hero of the *Tomb Raider* series, has a certain range of functions that allow her to jump, run, walk, swim, and shoot, as well as perform various other moves. These actions might be limited and directly correspond to the game world design. Lara’s jumping abilities, for example, define the distances between different ledges and other surfaces. They directly affect the level design. Defining these game-specific functions provides a valuable element for structuring interactive access and positioning evocative elements in game spaces. Realizing them in a concrete gaming session is left to the player. When the textual machine is at work, it transfers control over them to the player. Where the function patterns become too prescriptive and formulaic—for example, in the exact input patterns a player had to follow to finish Dyer’s *Dragon’s Lair* (Dyer 1983)—the play gets prescribed.

Interacting with and navigating in a 3D video game world are less limited functions. If anything, we have seen an expansion of this freedom in the “free-roaming” game world of *Grand Theft Auto III*, which applies clearly restricted

interactive options in regard to each element within the world: objects, cars, buildings, other characters. Indeed, the limitations of the characters force them often into archetypal schemata not unlike Propp's archetypes. But their assembly along a free-chosen path of the player through the game world hides the system's limitations and projects the illusion of a complex game world. Liberty City, the virtual space of *Grand Theft Auto III*, can be interpreted as the spatial universe that qualitatively changes and combines the limited character attributes of the inhabiting non-player characters. Because they all seem to live and act in such a huge open world, they appear to be more complex themselves. That is why *Grand Theft Auto III*'s Liberty City is an example of the way in which virtual space offers a genre-defying arena for free play, where Proppian functions can define interactive options but add up to a rich and less-confined possibility space.

5.3 Discourse

During the growth of the structuralist movement in the 1970s, language became a central point of departure for narratology. The position of the reader in relation to the text became a new focal point in the discourse. *Discourse*, in its widest sense, has been defined by Benveniste as "every utterance assuming a speaker and a hearer, and in the speaker, the intention of influencing the other in some way" (1971, 209). The form of the discourse varies and can almost seamlessly blend from oral to written language and by extension—as Chatman highlights—between any expressive medium (Chatman 1978, 31). Later approaches have further strengthened the position of the reader/listener in the discourse and influenced the work of Todorov and Barthes, among others. This has continued with the discussion in hypertext and game studies.

Bolter argued that the notion of "readings" replaces the "story" in the encounter of a hypertext such as Joyce's *afternoon, a story* (see also Bolter 2001, 125). To adapt the discourse to video games, interfaces offer options to the user in the form of possible activities. Performing one of these possible activities allows players to evoke the event in the video game world and deliver a form of Benveniste's "utterance." Players do not bash buttons for the sake of doing so but because of some significance they filter from the game and assign to the outcome of that button-click and its effects on the game world. Interaction is usually intentional.

The discourse in video games comes to life through the interactive functionality, but also on the level of the presentation. Video games still tell. There is an inherent situation of narration in playing a video game because

each game includes the mediated plane. This necessarily opposes some fundamental ludologist statements (see Juul 2001; Eskelinen 2001a) but seems inevitable. There are few possible interactions in 3D video games without spatiotemporal localization, and there are no events without a description. The dominating form of presentation in video games is the cinematic mediation of sound and moving images, which narrates the events back to the interactor during the interaction itself and constitutes the telling of the evocative narrative elements. If every 3D video game needs this presentation and at the heart of this telling we find a narrative process, does this transform every 3D game into a story? The simple answer is “no.”

The presentation affects the narrative quality in games but the meaning and plot assembly remain with the player. The very same discourse also includes, for example, clear ludic aspects in the player’s interaction, or social aspects in player-to-player communications. Localizing the narrative situation in games does not exclude other qualities that operate in connection to it.

What we encounter in the narrative situation is a level of *narrating*. Genette—one of many narratologists drawing from Benveniste—defined narrating as “the producing narrative action and, by extension, the whole of the real or fictional situation in which that action takes place” (1980, 27). Likewise, we find a distinction between event and telling of event in video games. Often the player might control the actions but their presentation is defined by the game system. Narrating is either entirely controlled by the system or at least restricted by the limitations set in the game. For example, the freedom of the virtual camera, an entity necessary to interpret and narrate the 3D space, can be heavily constrained. Through this shaping of the narration, the game influences the discourse not only on the level of the provided interactive functions, but also through their presentation. That does not mean, however, that games turn into movies.

Narrating in video game spaces differs from that of fixed literary or cinematic pieces. It occurs at the same time as the generation of the interactive event and is influenced by it. While literary, cinematic, and many oral forms of narrating build on events past and retold, real-time virtual worlds—like live television or radio broadcasts—narrate the events at the moment of their manifestation. Because of the specifics of 3D game worlds, which allow variable camera and sound work to customize the presentation, the narrating becomes highly flexible and rich.

These narrating and mediating elements have to be utilized and approached as valuable expressive vocabulary. They are in no way restricting the interactive functionality of 3D video games but are an essential part of their nature

as mediated and player-dependent texts. Players can only interact with the game elements as they are presented to them via the narrating entities (like the virtual camera) and the event can only be narrated when created by the player. In video games, interacting and narrating are dependent on each other. In game spaces, any situated interactive event and its presentation are intertwined. The frequent criticism that confusing camera angles in video games complicate the playing of the game is one indication of how one affects the other and how interconnected the two worlds are. Part II of this book will investigate the way games present their virtual spaces in more detail.

The combination of narrative and interactive elements ultimately has relocated the narrative operations. The *fabula* is connected to the playing of the game: the interrelation of rule-based space and play space as events are generated; the sjužet is still heavily driven by the game system; the discourse grows from a combination of these interactive events and their specific event narration. It encourages the player to form a plot as a way of comprehension of the interactive situation and a means for further interaction.

What, then, are typical spatial structures of 3D video game spaces that might shape the player experience into a meaningful whole? What are space-driven occasions, in which narrative elements of given game spaces meet with player activities?

5.4 Quests

A range of models has been suggested for a structuring of video games and other new media artifacts, and a number of them have been implemented in commercial as well as academic environments. Some scholars have applied Aristotelian dramatic principles to interactive pieces (e.g., Laurel 1986, 1993; Meadows 2002); others have used these principles as references but reshaped them into new frameworks (e.g., Mateas 2002); and various dramatic structures have been used (and taught) for interactive digital media (e.g., Wimberley and Samsel 1995; Garrand 1997; Siegel 1996). Opposing such an approach, some ludologists (e.g., Juul 1999; Eskelinen 2001a) as well as hypertext theorists (Landow 1997) have rejected any adaptation of Aristotle's principles for interactive media, or have offered different references (e.g., Frasca 2001, which suggests Boal as a different theatrical model). Approaching a possible dramatic structure from the vantage point of space, the following paragraphs will argue not based on an existing theatrical structure but from the notion of movement and possible dramatic structures evolving from its realization in game worlds. The structure that covers this space-driven approach best is the idea of the quest.

Video game worlds are not limited to a depiction of motion such as film—they contain it. Unlike the conditional links and passages of MUDs or hypertextual structures, the navigation of 3D video game spaces offers a multidimensional form of interaction.

Grand Theft Auto III is a game where the player is staged as a small-time criminal on his way to greater fame and notoriety. I got completely distracted from that path when I encountered one type of optional sub-mission in the game. *Grand Theft Auto III* offers randomized taxi missions. To do a taxi mission in *Grand Theft Auto III*, I have to hijack a taxi, master the handling of this specific virtual car, find a passenger looking for a ride, compete with other traffic, and find the best and shortest route through the city to the designation. Once the first passenger is delivered I might find more random passenger pickups and continue. I am on constantly changing missions that clearly involve me in the game's urban landscape. As I become part of the flowing traffic and the world of Liberty City, I engage with the space—far more so, for example, than in *Tetris*. *Tetris* is a direct engagement with the spatial as an abstraction. It is about spatial logical relationships but does not allow for an exploration of changes between them. The single static screen of a level in *Tetris* does not allow for shortcuts or customized exploration. Players do not proceed through this world but deal with the abstract relations within it, turning and positioning the falling blocks appropriately. In contrast, my virtual travels stand out as typical experiences of 3D video game spaces. From the moment of finding the right car to the delivery of another customer, the structure of the taxi missions mirror largely that of simplified quests in virtual space. At the same time, quests have been heavily investigated in literary studies. The following paragraphs will try to combine the two.

Movement in virtual worlds can be intuitive, as we project our well-established physical spatial experience into the use of those virtual spaces. At the same time, movement is complex and “deep” in its variety and interaction. That is why movement and the presentation of movement heavily influence the emerging discourse. This leads to a new focus on spatial design and architecture in games and has left its mark on the role of the designer of these environments. According to Walser (cited in Rheingold 1991, 286): “Whereas the playwright and the filmmaker both try to communicate the idea of an experience, the spacemaker tries to communicate the experience itself. . . . Thus the spacemaker can never hope to communicate a particular reality, but only to set up opportunities for certain kinds of realities to emerge. The filmmaker says, ‘Look, I’ll show you.’ The spacemaker says, ‘Here, I’ll help you discover.’”

No ultimate, dramatic über-structure can be defined for video games. They are too diverse for such an attempt. But a spacemaker provides experiences

through the structure of the virtual world. The designers of *Grand Theft Auto III*'s Liberty City had to decide on the layout and appearance as well as the contents of their city. This fundamental way of shaping can be a starting point in the search for a suitable dramatic form. For a player, this spatial/urban design affects their constant interaction as movement. It changes the logic and form of their spatial progression and points to the motif of the epic quest. Quests have become a point of interest in a range of game study essays (Aarseth 2004; Fuller and Jenkins 1995; Jenkins and Squire 2002; Jenkins 2004; Tosca 2003; Tronstad 2001; Wibroe, Nygaard, and Bøgh Andersen 2001). As each scholar applies a slightly new perspective to the issue, a short clarification of what a quest is seems necessary.

Here, the idea of the quest starts from movement in (virtual) spaces and the idea of traveling through a world. Travels have been acknowledged as a powerful literary feature: De Certeau even argued that every story is a travel story, as it has to include spatial practices that localize events (Certeau 1984). These travels can be used by the spacemaker and form an essential ingredient of 3D game worlds that stands out as a spatially defined pointer to possible dramatic structures. Fuller and Jenkins established this connection and outlined the parallel between literary travel logs and explorations of virtual spaces (1995). Every event in these worlds has a certain time and a certain location and both are often connected to a virtual journey through the environment that is filled with moments of exploration and discovery. Consequently, Jenkins suggests that we should “think of game designers less as storytellers than as narrative architects” (2004, 129) who “don’t simply tell stories; they design worlds and sculpt spaces” (ibid., 121). His approach reiterates the spacemaker principle but adds the idea of narrative elements to it. Space can offer direction for narrative comprehension, and this book argues that this direction can be supported by evocative narrative elements.

On the side of the player, these sculpted spaces provide the quest where spatial comprehension, navigation, and mastery define victory or defeat, progress or entrapment. Players grow into the quest, using the narrative elements provided by the game as reference points to position themselves on the quest (this is what Tosca [2003] termed the “semantical quest”). Like any useful structural model for content in video games, quests grow from a combination of the various spatial planes involved. Ultimately, every player embarks on his or her own unique quest. But for the spacemaker, the term offers a structural model. It provides a guideline to position the evocative narrative elements. The question, then, is whether these quests have any typical, intrinsic structure.

It does not come as a surprise that a structuralist like Propp provides a pattern for quests based on the functions he established before. In his model, the hero has to make his way from an initial situation (e.g., hero loves princess and wants to marry her), to a preparatory section (e.g., the queen mother forbids the wedding because the hero is not a knight or prince), to a complication section (e.g., but the kingdom is plagued by an evil witch, and killing the witch would get the hero knighthood), to a donor section (e.g., hero travels through the kingdom and meets a wise woman, who gives him a magic potion to defeat the witch), to action section (e.g., hero finds witch and defeats her using the magic potion), from where the action either repeats (e.g., the queen mother demands another proof), or it ends (e.g., hero marries princess and they live happily ever after). Propp describes each step along this journey with the previously mentioned functions. In his approach, the quest is a conglomerate of story functions residing in the written text and the hero is but one part of it. Heroes follow the given path along a fixed trajectory.

Other approaches are more centered on the figure of the hero and interpret quests as processes of personal growth and maturing of the hero. Such a character-based approach better supports the focus on the player's experience through design. A widespread model is that of Joseph Campbell. Influenced by Jung, Campbell developed a cyclic quest model, the "Hero's Journey," that uses the idea of the "monomyth" (J. Campbell 1968). Campbell argues that the monomyth provides a basic frame for any myth or quest structure. Followers of Campbell's theories even transfer the model to other disciplines. Vogler argues, for example, that the monomythical view toward a quest is relevant not only for analysis of narrative pieces but also for the writing process. The writer's own life can be seen as a form of a quest (Vogler 1992). It is impossible to confirm or disprove such an all-embracing approach. However, the monomyth model does offer one possible way to imagine a dramatic form that is rooted in the element of the video game space and its exploration. It is relevant, because it can be applied to the comprehension processes thanks to its gradual character development. At the same time, it depends on the hero's actions to further develop. The quest is not found in the realms of the fixed work but in the experience of the player. Its basic structural schemata however remain.

References to the monomyth model have been drawn before (e.g., Dunning 2000 or Tosca 2003), but as this chapter has shifted the production of narrative to the player, we look at the monomyth not as an act-like form that can be condensed to a level-driven, "numbered" structure, but as a guide for a space-driven approach to Campbell's principles.

5.5 The Concept of the Monomyth

Joseph Campbell suggested that it does not matter “whether we listen with aloof amusement to the dreamlike mumbo jumbo of some red-eyed witch doctor of the Congo, or read with cultivated rapture thin translations from the sonnets of the mystic Lao-tse; now and again crack the hard nutshell of an argument of Aquinas, or catch suddenly the shining meaning of a bizarre Eskimo fairy tale: it will be always the one, shapeshifting yet marvelously constant story that we find, together with a challengingly persistent suggestion of more remaining to be experienced than will ever be known or told” (1968, 3).

Vogler translated the *monomyth* model into a practical guide for writing screenplays that has been embraced by many filmmakers and screenwriters (Schlesinger and Cunningham 1996; Voytilla 1999). A Hero’s Journey along the monomyth circle can be summarized as follows: The upper half of the circle represents the hero’s ordinary world, which is subject to the lack of an essential element or a wound that needs healing. This initial threat to the status quo in the ordinary world initiates the call to adventure for the hero. But many heroes (often initially unaware of their heroic status and duties) refuse this call at first. With the support of a mentor-character, the hesitating hero crosses the threshold into the world of the adventure

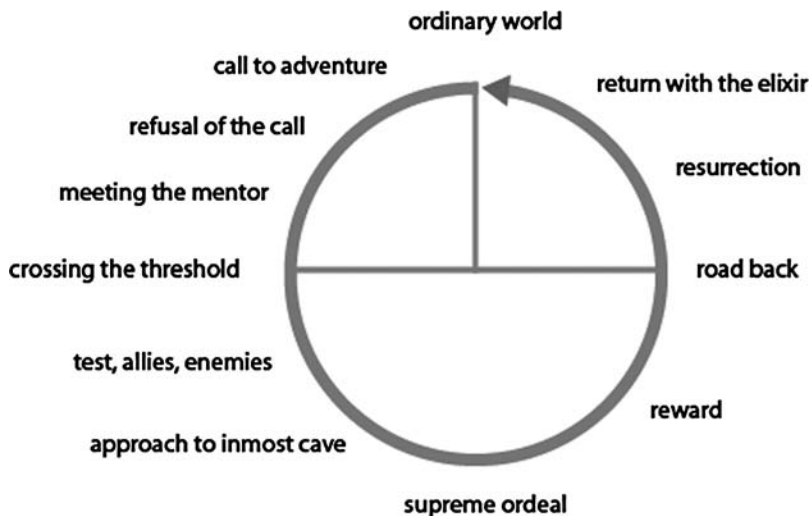


Figure 5.1 “Hero’s Journey” following Vogler’s (1992, 18) adaptation of Campbell’s original analysis (1968, 245)

represented in the lower half of the circle. Referring to Jung, Schlesinger and Cunningham describe Campbell's ordinary world as the "day" world of the consciousness, opposing it to the special world of "night" and the unconscious (Schlesinger and Cunningham 1996). The hero has to enter this special world of the adventure and often has to face his own inner demons to save the world. The special world tests the hero through encounters with friends and enemies on the way to the most threatening central locus of the problem: the supreme ordeal, often a death or near-death situation for the hero. Passing the supreme ordeal grants the hero the reward of the "elixir" needed to heal the ordinary world. The hero often changes and transforms during these adventures. This transformed hero returns to the ordinary world, and brings the elixir as the healing prize to fill the needs of the ordinary world, thereby healing the wound that necessitated the Hero's Journey in the first place (for the original description, see J. Campbell 1968, 245–246).

The claim of universal applicability made for the monomyth does not go undisputed—even in narratology circles. French rejects it as "sophomoric oversimplification" (1998, 40). Likewise, Walker rejects Campbell's reduction to one single universal myth (S. Walker 2002, 4; also 114) and argues that such a generalization sidesteps the highly personal emotional response of an individual to archetypal images. This response is crucial for the individual experience and the claim to universality ignores the vast diversity of myths known to us. Walker's critique touches on a fundamental element of video games, namely that the individual experience of a game is unique and difficult to summarize into one common model. This tension is present in game worlds at the intersection of rule-based and fictional planes. Forcing the monomyth too literally onto the game might ignore fundamental needs of gameplay that demand freedom and creativity. That is why the model is not suggested as a universal content-structuring formula in video game spaces, but primarily as a method for deciphering events in them.

Ultimately, the quest is conducted by the player and merely evoked and encouraged by the game system. Likewise, the monomyth applies primarily to the player. Yet, aware of this effect, one has to recognize it in the space-making process. The game designer can support a basic monomythical structure through the use of the evocative narrative elements. That is why the Hero's Journey has value as a useful model for the comprehension—and in return the possible design—of 3D game worlds. It is valuable because of three key reasons.

First, there is a strong connection between a spatial or personal quest and the various stages of Campbell's model. The monomythical structure is a character-centered model that depends on a voyage of discovery, which may be

self-discovery as well as discovery of new territory—or both. It mirrors the growing mastery of the game space by the player and the development of the player in relation to the video game world. The model is very flexible. If we see the game experience as growing from all five spatial planes, quests transcend these planes. A player might organize a raid in a multiplayer world using email or some chat program. That means that the first stages of the quest were already realized before the player logged into the game. Other players might start a quest but never finish it, or be sidetracked in other tasks. Players might share the same game event on opposing ends of the spatially defined quest, or they might depend on each other in a collaboration mode. Social plane and rule-based plane interlock in these events, and although the results vary widely they can still be framed as quests.

Second, the model's widespread use in successful film and television narratives (Voytilla 1999), many folktales (J. Campbell 1968), and other traditional narratives (such as literary pieces ranging from the *Iliad* to Tolkien's *Lord of the Rings* (1966) that have been adapted in many other media) indicate its relevance for audience expectations. Especially audiences of mainstream Hollywood movies have been trained to decipher monomythical structures. This increases the likelihood of a reading of the game events in accordance with the monomyth. Limiting as the dominance of one narrative form may be, it means that players are familiar with the structure and—consciously or not—look for clues to generate the context along this formula's method. In other words, it has become a convention. Thus, a video game can utilize the widespread acceptance of the monomyth for its own goal to engage the player better.

Third, another value of the monomyth structure for video game spaces is the fact that its original concept does not dictate dramatic high points at predefined moments within a certain timeframe. It is true that the adaptation of the monomyth into recording media, such as film, has forced the circle to unfold within a timeframe dictated by commercial and industrial standards. Twentieth-century recording and distribution methods forced the playing times of movies and TV shows into fixed time slots and program formats. Authors and filmmakers have responded by fitting the pace of their narratives into these formats, in the form of commercial-break-interrupted television show or feature film lengths. Restrictions like these depend on a commercial format that demands a precise timing of plot points, cliffhangers, and climaxes and forced the Hero's Journey into set timeframes. That is why script doctor Syd Field (1994) can demand that a certain plot point has to be on a certain page. Such uniformity was never implied in the original model, for which Campbell himself stated that stories could concentrate on different

parts of the circle or might rearrange and serialize them. The spatial exploration of a video game world via movement depends on the player's participation, which generates a unique timeframe and event realization. In return, this frees the content structures from the time constraints of other formats and restores to the Hero's Journey its original temporal freedom. Games can include time restrictions and countdowns, but these merely reproduce the commercial television's strife for set dramatic blocks. A player's exploration of the game space can be (and often is) independent from any temporal preconditions. A fan of the taxi missions in *Grand Theft Auto III* can avoid the main missions for any time. These factors interrupt the gradual rise of the thug to a crime lord but there is still continuous participation in the game universe. A player of *World of Warcraft* can travel the virtual lands and mine their resources without participating in the planted mission system. This is the basis for the practice of gold mining where players mine the virtual grounds for goods and disregard the game's dramatic setting completely. The game worlds are rich enough to provide enough options for personal quests that might avoid the central dramatic setting altogether. This supports the shift of the narrative elements out of the fixed work and into the realm of the player and the player's event realization.

Events along the Hero's Journey *do* have a logical and narrative order in relation to each other but no absolute fixed position in a defined timeframe. The different stages of the circle can vary in size, number, and order. There might be only one test in the world of the adventure or there can be dozens. A virtual hero might immediately accept a call to the adventure or might need a mentor's help. As Campbell notes: "The changes rung on the simple scale of the monomyth defy description" (1968, 246).

Thanks to such flexibility, the Hero's Journey can be applied to the whole *Odyssey* or just a single adventure in it, to the entire *Star Wars* saga or just one film in it (see Voytilla 1999), a whole interactive experience of a video game space or just a small segment of it. Such a flexible form is very promising for structuring game spaces and their experiences, as it does not depend on a fixed ending but can stretch one into infinity, into a never-ending *Odyssey* setting—an "ever-quest" in which the progression depends on the individual explorer.

The flexibility of the Hero's Journey structure can be illustrated by its operation on player-defined goals within a video game space. Often, players do not follow the goals intended by the designers, but embark on self-defined targets and develop their own quests in the game world that the designer may never have anticipated. Interactors can set themselves goals outside the dramatic demands set by the fictional world.

The original video game *Quake* teleports the player into the role of a lone space marine on an alien planet cast to face and defeat the enemy code-named “Quake” in progressive levels. The basic goals of the game are to proceed, survive, and kill. The *Quake done Quick* players, a community of dedicated *Quake* players, changed these rules to “survive and proceed (and kill) in the fastest possible way.” They added the extra difficulty of an optimized performance time to the original setting. This fundamentally changed the interaction with the game world and the playing experience. No changes to the game itself were made and the expert players play the entire game without cheating, but these players develop movement patterns and interactions that differ from a typical player’s behavior. For example, they use virtual blast waves of their own grenades as near-suicidal jump pads to catapult themselves faster through levels. They have optimized the time in their so-called speed-runs to twelve minutes and twenty-three seconds for the entire game played on the most difficult level (see the speed-run *Quake done Quick with a Vengeance* released on September 13, 2000)—a feat that might take a regular player hours. Their speed-runs still demonstrate a mastery of space and entities within the game world, yet optimized to their own terms. Theirs is a different quest in *Quake*, but one that is still unfolding in the given game space. Goals, stages, difficulties, and mastery are scaled up or down to the individual player’s approach.

Ultimately, it is up to the player to drive the exploration of the video game world, which can initiate a Hero’s Journey, but the monomyth offers a powerful tool to recognize these journeys and optimize the structure of the game world accordingly. The spacemaker sends players into the game world not to follow a predefined tale delivered through a linear medium but instead stages them in the center of the events that come to life through their participation. The timing of the events depends on their spatial interaction. The result is a form of quest that comes to live in the player’s comprehension and his or her interaction with the game space. Not only can monomythical principles be used to support and analyze players’ comprehension, they also can inform game world design. The monomyth model provides a scalable and adjustable matrix to help designers envision the way in which users might make sense of the events they encounter in a game world. It provides access to one possible structural approach that is spatially dependent and less rigid than other solutions.

Aarseth is correct in his overall claim that “the purpose of adventure games is to enable players to fulfill quests. This, not storytelling, is their dominant structure” (2004, 368). Yet comprehension of game elements during play is where the narrative elements come to work in the discourse. Without

narrative elements, a 3D video game would be in danger of disintegrating into singular unconnected splinters of momentary interaction. The quest model offers one way to connect these instances through a narrative framework suitable for game spaces and promises to support a meaningful comprehension through spatial structuring. In this regard, the concept of the monomyth promises to support engaging game worlds as it offers some structural format but leaves its realization open to the player.

Interactive and narrative elements merge in the actual experience and realization of the interactive event inside the game world. The game space encompasses and situates these elements while the game system narrates them to the player. If we have a mainly cinematic form of presentation, where do video game space and cinematic presentation overlap and where do they differ? What are the consequences? Part II explores the element of audiovisual presentation, which is the dominating form for narrating in video games. The chapters outline parallels and differences between the creation of virtual game spaces and cinematic spaces. In addition, the discussion focuses on the evolving narrative perspective and the position of the interactor in relation to the fictional world before a final analysis of the resulting spatiotemporal setting closes part II.

II

Presentation

Presentation is understood as the expressive and representational element of 3D video games, and the way they present the data of the rule-driven plane in the mediated plane. It is only through some form of presentation that a video game becomes legible to a player. Consequently, this seemingly noninteractive layer has a profound impact on the interaction. On the level of consumer electronics, the technology mainly provides elaborate audiovisual and limited haptic forms of presentation through their output devices. Moving images are the dominating representation of continuous movement in space, and cinematic techniques are the most elaborate forms of these moving images. That is why the analysis will concentrate first on cinematic visualization. Following the discussion of the visuals is an overview of the audio features available in video games. Finally, part II addresses the narrative layers that are opened up through these techniques of presentation.

Games as Moving Images

There are a wide variety of 3D game titles spanning all genres and conventions. They all share the visualization of a virtual game space by means of the moving image. A perspective is created toward the game environment in which the interactive event is localized. Other interface elements such as health indicators, ammunition counters, maps, and timers have important functions in the graphical presentation of a game, as well as in the condition of an interactive event; however, because this book concentrates on spatial features, these interface options will be largely left aside. Instead, the following pages will look at the 3D video game as a part of the wider category of media using the moving image. The close relationship between games and moving images will be further discussed in section 6.3. First, a brief historical overview and a look at architecture and the moving image will provide necessary context.

6.1 A Brief History

Early interactive digital titles like *Tennis for Two* or *Spacewar!* used simple 2D animated graphics and depended on moving images to simulate coherent movement on a display screen. This dependency stayed part of the history of video games. Continuous movement through the game world has already pointed to the use of quests as dramatic structure. It is also a driving force in the presentation. The illusion of movement in games as well as in film or television depends on changing images and the speed of their replacement. The demand for movement presented at a high and stable rendering speed had enormous impact on the development of many video games. Rendering

out the images as fast as possible occupied a significant percentage of the processing power available. Keeping this image generation at an acceptable level often demanded changes in the game design. It potentially limited the number of active objects on display, their appearance and/or behavior, as well as the resolution of the graphic display itself. In every way, the complexity of a game's functionality and its dependency on a fluent presentation were interconnected from day one.

With the dawn of more powerful technology, developers started to apply more elaborate animated 2D graphics, animated 3D vector graphics (e.g., *Elite* by Braben and Bell [1985]), and polygonal characters (e.g., *Alone in the Dark* by Raynal [1992]). In addition, new data storage methods like CD-ROMs, console cartridges, and expansion packs allowed for video-playback capabilities in games.

Video played a significant role in the shaping of interactive titles from early research works such as Lippman's *Aspen Movie Map* (1978) and artistic experiments like Weinbren's *The Erlking* (1986) to consumer products such as *Psychic Detective* (Sanborn 1995) and the role of cutscenes in today's games. Whether it was the interface, the lack of interactive access, or other design issues, for one reason or another, "interactive cinema" on the television platform and in the public cinema did not catch the interest of the audience. A direct mapping of filmic traditions onto the game proved to be short-lived. Still, there is interesting work growing from the overlap of the two media, as seen in research groups such as Glorianna Davenport's *Interactive Cinema Group* at the MIT MediaLab (until 2005), Georgia Tech's *eTV* group under Janet Murray, and Lev Manovich's work on *Soft Cinema* at the University of California, San Diego. Spreading broadband access and HDTV-ready game consoles seems to have reawakened some of the early enthusiasm in interactive television, albeit in a different, more game-related form. While the experimental depth and commercial value of interactive cinema remains big, few of today's commercial video games claim to be interactive movies a notion that was far more en vogue a decade ago in titles such as the *Wing Commander* series. Now the game is the leading force in the way moving image traditions are adapted, changed, or launched in interactive media.

Although the notion of interactive cinema as some form of hybrid between linear video and interactive application in video gaming has been largely abandoned, the combination of full-motion video and gameplay has grown—for better or worse—into the tradition of the cutscene and hybrids like Machinima. The reference to cinema from the video gaming side seemed to work much better than the attempts of the cinema industry to embrace the interactive features of video games. Instead of following cinematic production

methods, games deal with a remediation of cinematic effects in order to provide the player with a cinema-like visual presentation. CD-i games like the original *Dragon's Lair* and games with large amounts of prefabricated video material, such as *The 7th Guest* (Landeros 1993), or *Roberta Williams' Phantasmagoria* (Williams 1995) have their place in the history of video games. But as graphics kept on improving and 3D worlds became available, a lot of the attention shifted from a sheer implementation of video into games to a less direct adaptation of cinematic techniques in the presentation of these new 3D worlds.

On the level of consumer platforms, a defining watershed in the use of virtual 3D spaces occurred in the year 1995 with the international launch of the two breakthrough 32-bit consoles capable of 3D graphics—namely, SEGA's Saturn and Sony's PlayStation. Thirty-two-bit technology was available before that, in consoles such as the 3DO (which derived its name from the fact that it could process 3D graphics) and the Amiga CD32. But while Commodore, the producer of the Amiga CD32 filed bankruptcy in 1994 and the 3DO died in 1996, SEGA and Sony popularized video games to new masses and went on to grow into significant contributors to the field. 3D video game spaces—or pseudo 3D spaces—had been available before on the PC (see, for example, *Castle Wolfenstein 3D* by Blochowiak, Carmack, and Romero 1992) but the success of these 3D-capable game consoles stands out as a defining turning point in the rapid growth of video game spaces and their availability to a large consumer base. Games on PCs were riddled with technical challenges. Installation could be problematic, computer maintenance was necessary, there were compatibility issues, and the games lacked a shared standard. PCs also come with the stigma of being a tool for work, a part of our working environment. Games are almost exclusively created on personal computers—as are many documents, spread sheets, and tax reports. The console lives more in the leisure world of the television and the video recorder. While the technical superiority of the constantly updating PC world put it into a prime spot for cutting-edge developments compared to the longer development circles of game consoles, it also meant that players had to “work” to get the best performance for their games on their constantly changing computer. Consoles changed the play space as they brought the virtual space out of the office or the “computer room” and into the living area. One did not have to be a geek to enter a game world anymore.

Ever since, 3D capabilities have improved and developed toward more and more detailed representation. Generations of game engines like Epic's *Unreal* engine, Id software's *DOOM* and *Quake*, or Valve's *Source* engines—all of them originally conceived for the PC and then adapted to consoles—offer little to

no development of their original interactive features. They concentrate predominantly on improved performance of 3D graphics. Visual detail has become the fetish of some game developers who entered into a kind of space race to the most advanced presentation form. Such a focus on graphics and its dependency on software and hardware improvements led Mactavish to argue that a game's narrative is "about special effects and our astonishment over new developments in special effects technology" (2002, 43). Although his point is well taken as part of the discussion of games as "surface play," his position overemphasizes the influence of technical performance on the enjoyment of computer games. Effects are an important factor to achieve the impact and expressive qualities of video games—narrative or not. But as previously argued, the narrative grows from a comprehension based on interaction with and reading of the game world.

Mactavish's argument might apply to effect-ridden cinematic forms (see also K. Hillis 1999; King 2000), but cannot translate to video games that depend on this interactive element. Ndalianis offers a more convincing theory to this culture of the surface play when she traces the spectacular in contemporary entertainment back to the baroque. Based on this historical backdrop, she acknowledges the foregrounding of the technique's spectacular effects and techniques. At the same time, she includes the recognition of these technical production methods as part of the virtuosity and an element of the presented content. Ndalianis notes, "The spectator, in other words, should recognize the way science has been placed at the service of artistic skill" (2004, 165). Her combination does not replace any visualized narrative with a technical one but points toward a merging of both that becomes tangible when the scientific and artistic production method is revealed or addressed within the work. When visitors enter the Church of St. Ignazio with its trompe l'oeil ceiling paintings by Andrea Pozzo seemingly stretching right into the heavens, then the effect is not immediate—unlike the opening sequence of an effect-ridden blockbuster movie that overwhelms its audience. Visitors to St. Ignazio have to find the optimal position on the ground to get the full impact of the visual effect in the paintings. Until they find this spot the art piece reveals its technical origin yet does not reduce one's awe for the achievement.

Gunning outlined the same effect for early cinema (1989). Following his theory of a "cinema of attractions" he sees early movie audiences less absorbed by the visuals and more as conscious spectators of a technical novelty. This novelty was in fact constructed and presented to suggest awe as a technique. "Placed within historical context and tradition," he wrote, "the first spectators' experience reveals not a childlike belief, but an undisguised awareness (and delight in) film's illusionistic capabilities" (ibid., 45).

One can easily draw a line from those educated audiences to the community of video game players that are aware of the technical developments in video gaming. They might not be coders, but legions of gaming publications not only preach games as content but also celebrate game consoles' hardware or advice on PC upgrades to provide better gaming experiences. Many gamers are very much aware of the technology they use. The growing number of postmortem reports and "making of" movies on the creative process in game production offer further education to the interested player. Technical achievements of a new game or game engine are often marketed as unique selling points to players. Video games occasionally even reveal the creative process of game production within the game world itself.

I traveled far and wide through the world of Spira, the game universe of *Final Fantasy X* (Kitase 2001) before I reached the "Luca Sphere Theater." Until then my adventures had unlocked beautifully rendered cutscenes and the soundtrack seemed to continuously grow. The Luca Sphere Theater is an in-game space that allows me to revisit ("buy") most of the music and video clips as I uncover them and "play" them in a virtual projection room inside the game world. The music and the cutscenes are made available inside the game world but outside their original context as special events.

The presentation references the game's technological nature and its production process by reusing its exceptionally high-standard film and musical assets and it does so within a continuous game space. The 3D world hosts both, documentation of the production process as well as the result of this production, the game universe. A visitor to the Luca Sphere Theater stays immersed in the game world but rediscovers the art of the game's production. Other titles provide access to conceptual artwork created by the game's artist in the pre-production process. *Prince of Persia: Warrior Within* (Mallat 2004) allows players to gradually unlock concept art through an exploration of the diegetic video game space. Finding another piece of this production puzzle is set up as a reward for successful game mastery. Thus, the gradual uncovering of the behind-the-scenes elements goes hand in hand with a growing mastery of the game world. The technical feats of the game creation and the growing ability of the player in the mastering of the video game world interconnect. In these cases Mactavish's argument fits, but it still remains a side aspect of the main game experience, which more often centers on task and settings within the fictional game world.

To interact with the virtual space the player has to look through the technology and deal with the representation. Gunning argues in regard to the Lumières' *L'Arrivée d'un Train à Ciotat* (Arrival of a Train at the Station) (Lumière and Lumière 1895) that the "train collided with no one. It was, as

Gorky said, a train of shadows, and the threat that it bore was freighted with emptiness” (Gunning 1989, 45). In a video game the train would collide with a character if no evasive action were taken—and an impact would change the player’s position. That is why narrative comprehension remains necessary even for the tech-savvy game player.

But Mactavish’s cross-referencing to cinema highlights the spectacularly improving graphic performances that allow events in virtual games spaces to unfold at a visual quality ever closer to that of video. Game consoles broke the 64-bit (Atari’s ill-fated Jaguar claim a heavily disputed first place here) and 128-bit (with SEGA’s Dreamcast) thresholds. Multiprocessors and specialized chip sets in consoles and PCs opened up even more powerful performances. The visual qualities of 3D video games and traditional moving images are leveling up as game pictures become more and more indistinguishable from video images, and as technologies like HDTV are embraced by game technology. Not surprisingly, stylistic cross-fertilization and cross-referencing between cinema and video games have been identified from Nelson (1990) to Bolter (1997) to King and Krzywinska (2002) to Wolf (2002) and Wolf and Perron (2003), among others. In fact, these references have been applied to a degree that evoked the notion of “cinema envy” (as mentioned by Jenkins 2005) as well as their strong rejection (Eskelinen 2001b).

With space as its vantage point, we have to approach cinematic expression as closely connected to the creation of this virtual space. Cinematic visualization is seen as the audiovisual means to present game spaces via moving images. Thus, parallels between games and film primarily are meant to be read as space-driven necessities and not as cinema-infused guidelines for games.

6.2 Architecture and the Moving Image

Film and architecture have interconnected at least since the 1920s, when modernist architecture broke many of the frames established by traditional practices. A blurring of distinctions between inside and outside, the opening of surfaces, and dynamic arrangements shifted the focus on the visitor and the exploration of the space. This exploration could be shaped through sequencing, vistas, and movement, which in turn could be shaped by the architect. Once more, movement and structuring this movement stand out in the design. Frank Lloyd Wright is only one example of this development. It was Le Corbusier who introduced the term of the “architectural promenade” and implemented it notably in his Villa Savoye (1929–1931). “In this house we are presented with a real architectural promenade, offering

prospects which are constantly changing and unexpected, even astonishing” (Le Corbusier 1991). The promenade is rooted in landscape architecture and in the idea that it can create a tension between idealized spatial arrangements and the sensations they trigger as one navigates through them. It is not an invention of the twentieth century to shape a structure around the experience of the visitor, who explores it through movement. Historically, this has been part of many spaces designed around rituals, processions, and performances. The Stations of the Cross in a Christian church present a pathway through the building that takes the visitor from one significant point to the next in an exploration of the whole church building; landscape architecture has implemented comparable concepts, for example in the design of gardens where pathways open up new vistas and lead to new discoveries for the visitor.

But in the 1920s architecture gained a new media to reference in this structuring process: cinema. It is not surprising that architects like Robert Mallet-Stevens worked in film as well as in their original domain. So at the same time that Mallet Stevens, together with Auguste Perret, founded the architectural review *Architecture d'aujourd'hui*, three short films were produced by Pierre Chenal in collaboration with Le Corbusier. The purpose of these films was not only to publicize their new forum but also to work as a form of propaganda for modernist architecture. In return, architectural theorist Sigfried Giedeon replied that “only film can make the new architecture intelligible” (Giedeon 1996). Around the same time (1929) Mallet-Stevens’s own architecture was captured on film by Man Ray in *Les Mystères du Château de Dé*s (Ray 1929). Like in Chenal’s film, movement and energy dominate Ray’s work: the camera swoops through buildings, focuses on speeding cars, travels over facades, rushes through the building; the editing can even be distorting. If a moving viewpoint was demanded by the new architecture, the film camera was more than willing to provide it.

Expanding the cinematic from a building to a whole city, we see the birth of the city symphonies in milestone pieces such as Ruttmann’s *Berlin, Symphony of a Great City* (Ruttmann 1927). As Penz argues, “The city of the 1910s and 1920s is quintessentially ‘modern’ and film-makers were keen to work with this symbol of modernity. Cities are perpetually on the move, things happen fast, and the idea of capturing the speed of it all embodied the ideal of the Futurist movement” (Thomas and Penz 2003, 144). Other commercial film productions presented and experimented with ideas for a city of the future as seen, for example, in *Metropolis* (Lang 1927). The urban structure itself comes to life through the work of the filmmaker, and in the person of Ruttmann we find another architect-filmmaker combination. The Eameses’

Powers of Ten (Eames and Eames 1977) takes this to the next level when its camera travels from the human scale of a man sleeping in a park into the outer universe looking upon the galaxy and back into the microscopic detail on the man's hand. It seemed cinema provided the right canvas for architects—like Charles and Ray Eames—to operate on all scales and visualize them in some form.

The moving image also gained prominence as a tool for architectural design. The digital revolution especially led to new production and design techniques. Architects were able to generate walk- and fly-through planned buildings to illustrate and test their spatial configurations. Finally, adapting video games to their design process, architects were able to provide future inhabitants a *virtual promenade* in the form of interactive exploration. In such a virtual promenade the spatial control is given back to the visitor/player but the image remains an artificial, computer-generated visualization of space (Richens and Trinder 1999; Shiratudding and Thabet 2002). The most interesting step, though, happened when architects were inspired by these virtual computer-generated spaces to leave the physical realm altogether.

From a technique to assist design and an aesthetic form of expression, the moving image and the virtual space finally shifted into the main focus for some architects. Marcos Novak's work on "liquid architecture" depends on computer-generated space that lives entirely in the virtual realm (1991, 1996b). As early as the mid-1990s, Novak (1995, 45) argued for such architecture in cyberspace: "It would be an architecture designed as much in time as in space, changing interactively as a function of duration, use, and external influence; it would be described in a compact, coded notation, allowing efficient transmission; it would allow different renditions under disparate fundamental geometries; and it would be designed using the most advanced concepts, tools, and processes."

This form of virtual architecture depends on the computer as its host and can only be visited on the projection screen. It might have grown out of cinematic traditions, but once interactivity was added, it reached the world of video games. One can argue that the digital revolution included a revolution of the traditional cinema, but like Novak's work, virtual game spaces are not primarily "reinventions" of traditional cinema. They are a new format that applies cinematic and interactive techniques in order to become legible to visitors. Their origins grow from interactive access to these spaces and movement through them as a defining access point. Therefore, video game spaces are not descendents of cinema but of virtual navigable "otherworlds." While presentation of these otherworlds remains heavily influenced by traditions

established in cinema and television, their basis is in the interactive and navigable nature of virtual space. As the next paragraphs will illustrate, these otherworlds had to end up in the cultural field of the moving image, but they enter it from a different direction.

6.3 Necessary Cinematic Mediation

Virtual environments do not have a “natural” point of view. Disciplines such as architecture mainly work in reference to the human body and the naturally given human point of view, addressing its position (e.g., the positioning of windows to allow views outside a building), as well as its capabilities and limitations (e.g., using the viewing distance toward a ceiling painting). The human body rightly serves as the physically present reference point. In contrast, interactors are not physically present in virtual worlds but remain in the play space. Consequently, there is no predefined viewing position in a virtual game world.

Cave Automatic Virtual Environments (CAVE) and head-mounted displays replicate such a body-centered viewpoint. In them, the physical body of the user remains included and is the point of reference for the virtual space. But commercial game worlds do not provide such a cost-intensive interface approach. Instead, they use a single screen that displays 2D projection planes of the 3D game world. Each view into the game world has to be generated by positioning a virtual camera inside the virtual environment. As will be outlined subsequently, virtual cameras are not the same as film cameras, but the moving images they present to the interactor are part of the traditions established by other moving-image media. By analogy, these viewpoints refer to the established domain of film cameras. In that way, the cinematic enters the video game not as an extension of film but as a necessity of virtual space.

It is in the nature of a camera (virtual or real) to select, frame, and interpret. Through this selection, the moving image infuses the virtual world with a perspective. It narrates the space to the player. Because every video game space needs a camera, there can be no 3D video game without such a narrating. Even if this camera strategy is limited to a single viewpoint throughout the whole user experience—as seen in the first-person shooting genre—it still constitutes a particular perspective that uses a specific expressive range and features a genuine narrative force. It is here that the cinematic traditions come into play, opening up a well-developed reservoir of references and traditions, which have to be analyzed.

Ultimately, the cinematic mediation of the virtual space and the events is not neutral, but is an important factor that shapes the player's relation to the virtual world. The conscious visualization directs the interactor's perception of the game world and can attach specific meanings to the elements within the world it presents. It structures the virtual promenade in a cinematic way. In other words, because there can be no video game space without the narrative dimension of the virtual camera, we must investigate the camera's work in these spaces.

Cinema and Game Spaces

There are clear differences between video game space and cinematic space. Both are accessed very differently: the linear description in film vs. the non-linear exploration in games. But, at the same time, the parallels between the fictional worlds created by video games and film are strong and were recognized early on (e.g., Nelson 1990). The plane of the mediated space is part of the interactive system in video games, but it quotes many visual traditions from cinema. In order to keep the mediation legible, 3D games have lined themselves up in the tradition of the moving image, and it is not surprising that a remarkable amount of effort has gone into the use of cinematic visualization techniques in video games. This chapter will investigate these techniques based on the spatial approach already outlined.

7.1 Cinematic Space

Through the image “film makes space” (Heath 1976, 107), and it does so in various ways. Three approaches will be covered here: the spatial arrangements in the image itself; the way the camera explores the pro-filmic space; and finally, the role of editing. All three are interconnected but are separated here to establish a short overview over cinematic space and allow a look at the use of virtual cameras in games in the following section.

A single image can show only a fraction of a film’s event world at any one time on the screen, and the audience has to add the missing parts and generate context between the provided information. As Bordwell, Staiger, and Thompson argue: “The viewer, having learned distinct perceptual and cognitive activities, meets the film halfway and completes the illusion of seeing an

integral fictional piece” (1985, 59). While watching the film the audience imagines and slowly builds a fictional space that grows from a comprehension of many different shots. Hochberg compares this cinematic space creation and its edited results to the generation of cognitive maps: “The task of the filmmaker therefore is to make the viewer pose a visual question, and then answer it for him” (Hochberg in Bordwell, Staiger, and Thompson 1985, 59).

Within the single image the space can be ambiguous, flat, or deep (e.g., Block 2001). The difference between these three stages depends on the number of visual cues to support spatial representation. There are a range of such visual cues available in an image to “make space.” Arnheim suggested balance, shape, form, growth, space, light, color, movement, tension, and expression (see Monaco 2000, 183).

Ambiguous space is barely legible and lacks most cues that would allow for a coherent contextualization of the depicted environment. For example, an extreme closeup of an object can distort the audience’s spatial perception of the relative position and orientation of this object on the film set.

Flat space focuses on the two-dimensional quality of the projected image itself. It lacks most depth cues and visual cues point back to the same 3D plane. The picture does not provide differences in size or perspective directions, or other visible parallax effects. It can also flatten out color differences or shadows to balance the composition further. For example, the sideway perspectives of Muybridge’s famous motion studies use flat spaces. This concentration on the 2D surface has parallels to painting but there is a fundamental difference in the quality of the surface in painting, film, and video games. Paintings reflect light and thereby call attention to their surface structure. They can use the surface as an important part of their expressive means when the thickness of brush strokes emphasizes the materiality of the painting. In contrast, the cinema screen is a neutral reflection zone with much less character to itself. Mast argues, “the screen seems more to absorb the images (like a sponge) than to refract and bounce them, although such a refraction is literally what we see (but not perceive)” (1977, 141). TV and computer screens, on the other hand, emit light. Those “windows” into other worlds seem to barely contain the images within them. The argument comes full circle when Manovich points back to digital film as basically a form of painting and animation because it allows the direct manipulation of the image (2001, 295). This emphasizes the picture-plane qualities of game devices that can influence even game interfaces like the touch-screen of the Nintendo DS, for example.

In by far the most cases, the 2D picture of the projection is read as the presentation of a 3D space through the use of perspective and motion—this

creates the *deep space* effect. The result is a depth of field in the picture that can be utilized by the director/camera operator to open up different layers of action within the space of a single image, then traverse and explore them. The image itself gains a deep focus.

This approach finds a prominent cinematic peak in Welles's seminal film *Citizen Kane* (1941). Welles created multilayered spatial compositions and moved actors and cameras through them, thereby providing rich spatial depth through an elaborate *mise-en-scène* and camera movement. Unlike montage, which lets the audience reassemble the space from different images and their relation to each other, deep focus presents space as extending into the single image. Neorealist cinema, for example, adopted the technique because it was considered to provide a "larger" picture of the "real" pro-filmic space. Considering the importance of the creation of space in films, it is not surprising that the element of deep focus served as a cornerstone for Bazin's approach toward cinema.

Ambiguous, flat, and deep space categorize the number and work of visible spatial cues within the given image. Another approach looks at the relationship between the framed image and the off-screen spaces. Burch distinguishes between six types of off-screen spaces: above the visible image; under it; to the left of it; to the right of it; the space behind the visible set; and the space behind the camera (1981). Although the space of a single image is restricted by the on-screen information, it can refer to these spaces beyond its given framing. The image can be framed in such a way as to raise awareness of the world beyond the given image—its framing can be open or closed (following Monaco 2000, 185). The open form features visual cues that point to a world outside the frame. Just like the depth of field pointed into the space of the image, the open framing raises awareness of a world outside the single image. Movement cues, color arrangement, perspective lines, and any other signal that points beyond the framed image space to imply a world beyond its boundaries—all work for the open form. For example, a car passing through the image from left to right points to the relevance of some space outside the framed borders, and a hand reaching into the image from above or below points to the presence of a character in these off-screen areas. The latter is a widespread visual tradition in first-person shooter games where the hand of the player-controlled hero often reaches into the screen from below, indicating the presence of the hero character in that case. A closed form lacks these pointers and instead concentrates the attention to the depicted world as a complete arrangement.

It is in the combination of dynamic framing and orchestration of image space that the cinematic image gains its strongest spatial dynamics. Visual

cues combine with motion to give birth to the spatiotemporal quality of the scene. This can be traced in descriptions of early movie audiences. The painter Maxim Gorky, for example, recalled a visit to the Lumières' salon in the first days of cinema: "When the lights go out in the room in which Lumière's invention is shown, there suddenly appears a large grey picture, 'A Street in Paris'—shadows of a bad engraving. As you gaze at it, you see carriages, buildings and people in various poses, all frozen into immobility. All this in grey, and the sky above is also grey—you anticipate nothing new in this all too familiar scene, for you have seen pictures of Paris streets more than once. But suddenly a strange flicker passes through the scene and the picture springs to life" (see Cubitt 2005, 14–15).

The virtual Paris comes to life only through the element of motion. Within this space in motion, the event unfolds. Spatial understanding can be so dominant that it becomes a necessary element to support an audience's understanding of the action. That is why Branigan argues that "narrative in film rests on our ability to create a three-dimensional world out of a two-dimensional wash of light and dark" (1992, 33). Paris "springs to life" out of the limited frame of the still image and into a movement-action space. This means that we have to add the camera to the space-making forces. Thanks to the camera's (and projector's) technical performance, the motion can enter the picture.

Principally, the camera work during the recording of a film depends on two main elements: the position of the camera, including its movements and orientation, and the technical operation of elements working in the camera apparatus during the recording. The position of any camera aligns itself along the three axes that define the camera's angle and its position in Euclidian space. Camera movements (dollying, craning, and tilting) are possible along any of these axes and can be combined with each other in numerous ways (for practical discussion of the effects, see, e.g., Katz 1991, 1992 or Zettl 2004). At any given position, a camera can also change its angle toward each of the axes by tilting, panning, or rolling. A number of devices are used to control these movements on a physical camera, each with its own abilities and limitations: a dolly, crane, steady-cam, or simple tripod allow different levels of movement.

The mobile camera has made an important contribution to the development of the cinematic language. It was, for example, the technological basis for Vertov's "kino-eye" and became part of the image and film theme itself in his *Chelovek s Kinoapparatom* (*Man with a Movie Camera*) (Vertov 1929). Cinematographers like Burel, Kruger, Mundwiller, and Torpkoff in Gance's *Napoléon* (1927) and Baberske and Freund in Murnau's *Der letzte Mann* (*The Last Laugh*) (Murnau 1929) experimented with the freedom of the mobile camera. These masterpieces would not have succeeded in creating their unique

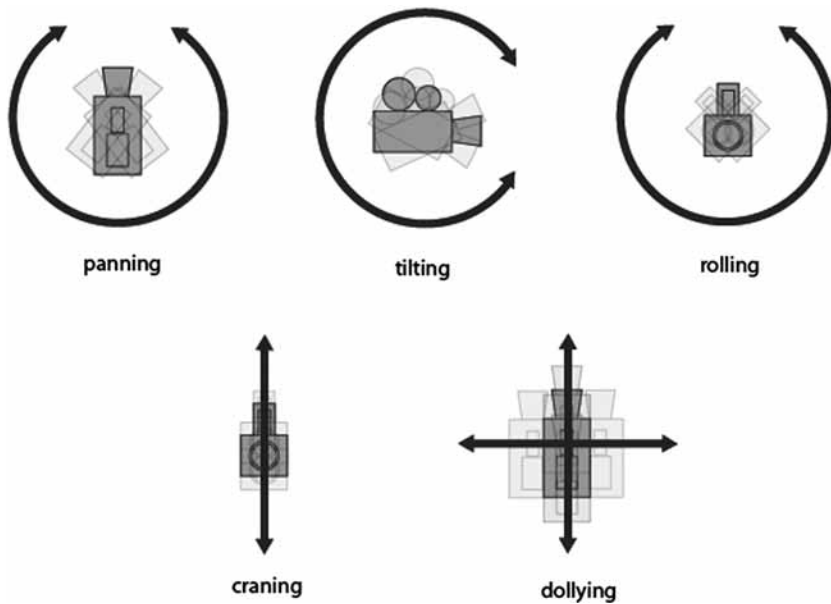


Figure 7.1 Types of possible camera movements

sequences without the mobile camera. Here, dynamic movements of the camera are used to dramatize the events and the spaces in which the actions unfold. Audiences follow the gradual unfolding of the city in Ruttmann's *Berlin, Symphony of a Great City* and can catch glimpses of tactical brilliance of a young Napoleon during a children's snowball fight in Gance's *Napoléon*, or the fragmenting movements of people, objects, and lights in the hotel in Murnau's *The Last Laugh*. Movement defines the role of the camera as both spatial and a spatializing entity.

In addition to its spatial positioning, functional elements within or attached to the camera apparatus and its optics shape the final picture. These include, for example, various lenses (enabling zooms and change of focus), different filters (changing the color range or adding visual effects), variable shutter speed (defining the rate and light intensity of the recording), and different film stock (offering variety of grain, color range, light sensitivity). Depending on their function, different cameras may offer special features that adjust for particular needs, for example in the form of high-speed cameras, extremely light-sensitive lenses, or steady-cam setups. While these effects mainly affect the shot image itself, they can still support the creation of deep space. Pulling the focus from an object in the foreground to one in the background is a

widespread example. Once again, the biggest impact grows from a combination of mobile camera and camera apparatus. Hitchcock demonstrates this in the film *Vertigo*, through his visualization of the vertigo effect (1958). To simulate this effect in a cinematically visual way, he moved the camera while zooming in the opposite direction. Through this combination he was able to create a stunning visual interpretation based on spatial variation. The shown space seems to expand and shrink at the same time and thus becomes unstable and insecure for the audience.

The technical features of the camera changed over time and this development directly affected cinematic traditions and resulting cinematic styles—and consequently spaces. For example, the matter of the camera's mobility defined production methods and artistic directions. When Éclair introduced their Éclair NPR (for Noiseless Portable Reflex) 16 mm camera in 1963, the new technology finally provided professional image quality for handheld camera work with live sound recording—both elements that defined the new movement of cinema vérité and its specific form of presentation. Nine years later, the Arriflex 35-BL and Panavision's Panaflex provided the same revolutionary development of a handheld near-noiseless camera for the 35 mm format. The mid-1990s saw the release of affordable prosumer digital video cameras like the Sony PD 100 and the Canon XL1. They significantly reduced production costs and suited the production style of the *Dogme 95* movement as they allowed for the direct and immediate recording philosophy of the *Dogme* artisans.

On the other end of the spectrum, Hollywood uses digital cameras not only in film productions since *Star Wars: Episode II—Attack of the Clones* (Lucas 2002), for which specific high-end cameras were developed, but also in television productions. A combination of an extremely mobile camera with a range of zoom effects, constant focus pulling, and reframing remediates cinema vérité style in the TV camera work of television series such as *NYPD Blue* (Bohco and Milch 1993–2005), or the new television serial version of *Battlestar Galactica* (Larson 2004–). Both are shot in high-definition television (HDTV) with digital cameras. Ultimately, the evolution of the camera has constantly left an imprint on the art of the moving image and the quality of the space it produces. The same applies to video games and their generation of game spaces.

7.2 Cinematic Image Space in Video Games

If a film audience were to step through the camera and onto the film set they would see a modern film studio. The diegetic film world would be decon-

structed as the production studio replaces the fictional world. Instead of a ceiling there might be a battery of lights; where one would expect the fourth wall, there would be cameras, sound equipment, and a number of technicians working to produce the illusion. This space is not the world of the story but that of the production of the film. The illusion created by the fictional world would be broken.

In contrast, it is a defining characteristic of video game spaces that they allow this step into the represented space. The result is a hybrid between architectural navigable and cinematically represented space. On the one hand, the game space is presented by the camera not unlike in film. As the audience steps through the screen into the world behind, they take the camera with them and enter a continuous navigable diegetic world like a never ending film set. The camera remains a narrative device. As Bolter suggests, “We understand and appreciate *Myst* precisely because we know what happens in detective films” (1997, 4; italics in original).

On the other hand, this virtual world is not the slave of the image. Players are free to explore and interact with it directly. Interactors might enter an expressive cinematic space, but now they can act in it. The necessary eye of the virtual camera makes these spaces cinematic and the interaction makes them accessible much like architectural structures. The player experiences game spaces in a combination of both, continuous navigable space and cinematic space. Such a combination has far-ranging consequences for video game worlds. It defines two fundamental frameworks, architecture and film, that help us understand 3D games better.

This connection of cinematic tradition and spatial use and understanding can be applied in video games. Some years ago, I was the designer for a research project at Sony Computer Entertainment Europe’s Cambridge studios, titled *Common Tales*. The goal was to experiment with cinematic storytelling techniques in a game prototype. In one of these tests we developed a sequence set in a small underground maze. The main task here was to use the connection between cinematic presentation and player navigation. We wanted to improve the maze-like quality of the sequence not by changing the geometry but through the camera work. In order to complicate the orientation and make the limited size of the virtual space appear larger, camera positions were arranged in such a way as to complicate a straightforward comprehension. By deliberately breaking traditions of cinematic presentation, the visualization of the maze creates a disorientating effect that influences the perception of space in it. Because the cinematic mediation does not follow the expected established cinematic techniques, the feeling of “getting lost” is intensified in the interactor’s experience of the maze. This complicates the interactor’s task of

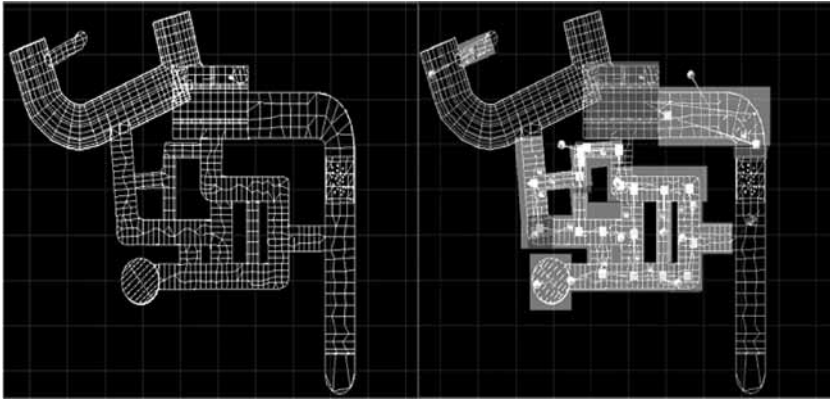


Figure 7.2 *Common Tales*: the spatial structure of the underground level (left); the structure with the implemented paths, nodes, and trigger zones (right)

mastering the maze and dramatizes the exploration. Such an effect is variable and can be used to support the dramatic means. In the case of *Common Tales*, once the dramatic situation is resolved and the interactor has found the exit, the camera work changes to a following camera that allows for easier exploration of the maze during a possible revisit. The virtual stage remains the same—the representation of the space changes dramatically and so does the player’s experience of the space.

A comparable effect can be achieved by repeating the same camera perspective to a similar-looking place again and again or reducing the spatial representation to a repetitive design. When we lack necessary visual and spatial cues, the game world can become ambiguous. The dungeons of *Castle Wolfenstein 3D* appear to us to be too repetitive today, as we have grown used to far more elaborate, detailed, and diverse virtual spaces (e.g., in its sequel *Return to Castle Wolfenstein* [Markham and Sherman 2001]). Today players are looking for much more and more subtle visual cues and the bare representational bones of those early 3D pioneers can seem like flat spaces because of their visual limitations.

Thanks to this higher visual quality, the virtual camera can also work as a guide. I can depict any detail of a space as an important element through framing, closeups, or focus-pulling and direct attention to it. *Prince of Persia: The Sands of Time* (Mechner 2003) is an elaborate 3D sequel to the original 2D title. Both games focus on spectacular spatial exploration of the virtual stage combined with action and puzzle elements. Both feature a strong and athletic hero presented through smooth avatar movements. The focus on the animation that had already been part of the original 2D *Prince of Persia*

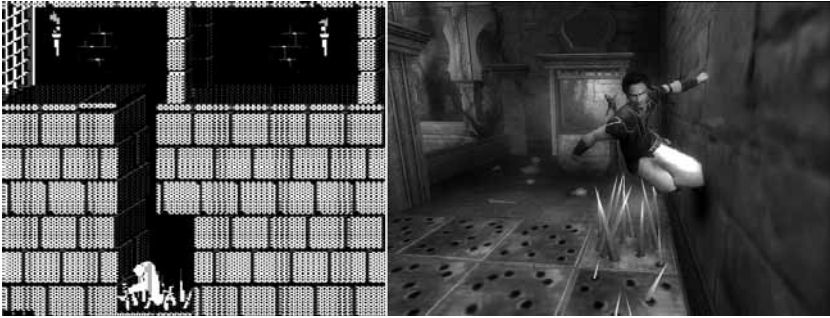


Figure 7.3 *Prince of Persia*: the prince has fallen into a trap (left); *Prince of Persia: The Sands of Time*: the prince escapes from a trap (right)

(Mechner 1989) was clearly adapted in the sequel. In both games, the player-avatar of the Prince has a wide variety of animations for spatial exploration and fighting. But the presentation of the video game spaces is fundamentally different and faces different challenges.

The original 2D *Prince of Persia* features a single camera in a typical side perspective used in many 2D jump-and-run titles. Its sequel has to show the—at times extremely complicated—routes through the level in 3D. The choice of camera perspective is crucial in planning one's route through the game world; it is important in enemy encounters and during the solution of spatial puzzles, and it is relevant to the timing and direction of most movements in the game world.

The player of the sequel has to read the depth of the virtual space and form a strategy to avoid its obstacles. The space is neither ambiguous nor flat, but navigating its depth becomes an important element of the gameplay. To support orientation, *Prince of Persia: The Sands of Time* offers elaborate camera work. One feature is a fly-through at the beginning of any complicated level that indicates the route to master it. The game offers a “scenic” view, a pre-defined static viewpoint to the level at hand that is set up to optimize the comprehension of the necessary features. Such a view cannot be complete and always excludes certain elements but it is further proof of the virtual camera directing attention and working as a narrative filter. The camera work can also present visual questions. If a certain location might not be immediately visible, this can indicate a possible hidden extra. Thus, to make the most of the game world in *Prince of Persia: The Sands of Time*, the player not only has to master the navigable game space, but also to decipher the quirks and cinematic traditions of its presentation. The fly-through and the scenic view focus

the player's attention on the relevant elements within the level. A piece of furniture that would have been disregarded can be introduced through the focus of the camera as the hidden exit to the next level; a flagpole that might have gone unnoticed is brought to attention and with it a whole new passage through the 3D structure.

Another example for the use of visual depth is a reappearing image composition in the *Metal Gear Solid* series. A dominating camera perspective in this series is a detached view overlooking the action. But the camera moves down to eye height and behind the main hero whenever the player-avatar hides behind a wall. The shot quotes a cinematic tradition from thriller and action movies that use the depth of the composition to juxtapose the player-avatar in the foreground and the target moving on a level deeper in the picture. Such a use of different depth layers can support different expressive meanings. Harpole points toward the notion of suspense that can be evoked by "the placement of a hidden killer in the foreground while his victim innocently washes dishes in the background" (1978, 243). *Metal Gear Solid* quotes such an effect: the player-avatar is the highly skilled character hiding in the foreground to avoid the unaware guards and succeed in his stealth mission. Suspense ultimately depends on an unequal distribution of information about a dramatic event. Here, the camera work implies such suspense as it supports and visually realizes tension between the differing depth layers that quite literally represent different levels of knowledge. The player in the foreground knows more about the danger of the situation than the possible victim in the back. At the same time, the player's view is also restricted in comparison to the dominating, down-looking camera. This down-looking view offers a wider overview compared to the "sneaking" camera. Thus, suspense is evoked visually in two ways.

The view is an important visual representation of the stealth setting of the *Metal Gear Solid* series, and is an important feature of the stealth gameplay as well as a visual exclamation mark of the series.

Again, visual details can become part of the gameplay mechanics over the development of the series. *Metal Gear Solid 2: Sons of Liberty* (Kojima 2002) includes, for example, shadows that could be spotted by the player or the enemy to locate a character. The third series installment puts emphasis on the texturing and the player has to select from a number of possible camouflage outfits to improve the hero's stealth abilities. Such a level of detail is clearly missing in the first 3D installment of the series.

Prince of Persia: The Sands of Time refers to the adventure and swashbuckling genres that position the hero in a strange otherworld, not to hide its wonders but to make them accessible, navigable, and open for conquest. Consequently,



Figure 7.4 *Metal Gear Solid* (left); *Metal Gear Solid 2: Sons of Liberty* (center); *Metal Gear Solid 3: Snake Eater* (right)—the hero hides in the foreground

Prince of Persia: The Sands of Time prefers a wider view. If we see Bruce Willis in *Die Hard* (McTiernan 1988) sneaking through the hallways of a skyscraper-turned-destruction-ground or Solid Snake infiltrating a military base in *Metal Gear Solid*, we read them as examples of suspense via depth. We can contrast this with Burt Lancaster in *The Crimson Pirate* (Siodmak 1952) or Errol Flynn in *The Adventures of Robin Hood* (Curtiz and Keighley 1938) as classic representations of the (male) body's conquering of space more openly—swashbuckling instead of sneaking. Traditions of image spaces seem to transcend from film to video game and bring with them a range of cultural connotations.

Many commercial modern computer games that want to evoke the mood and style of an established cinematic genre remediate and recreate their specific visual strategies in-game. These effects include slow motion (*Max Payne*), instant replays (EA's *Madden* series), action-dependent camera movements (*Metal Gear Solid*), or fixed stylized views of the virtual space (*Biohazard* [aka *Resident Evil* (Kamiya et al. 1996)], hereafter referred to as *Resident Evil*), among others. This growth of game spaces through cinematic referencing is by no means complete. Many references depend on technical restrictions and only become gradually available. For example, backlighting is a traditional technique to distinguish the character from its surroundings in film. In games, such a basic option of visual arrangement only became recently available with dynamic lighting and high-polygon characters.

Like their physical counterparts, virtual cameras improve over time and develop new options. Because these options directly affect the game space they need further and more detailed investigation.

7.3 Virtual Cameras

The continuous cross-referencing between film and video game has blurred some borderlines. Films inspire the computer game industry, leading to many

titles quoting or referring to film content and design. At the same time, video game production methods as well as aesthetics influence film and television. Video games are used during the previsualization of film productions like Spielberg's *Artificial Intelligence: AI* (Spielberg 2001; Lehane 2001), they create movie spin-offs, like *Lara Croft: Tomb Raider* (West 2001) and *Final Fantasy: The Spirits Within* (Sakaguchi and Skakibara 2001), and they influence the aesthetic as well as the content of films like *Tron* (Lisberger 1982) or *The Matrix* (Wachowski and Wachowski 1999). A film-related video game such as *Enter the Matrix* (Wachowski et al. 2003) can even include the directors of the underlying movie *The Matrix Reloaded* (Wachowski and Wachowski 2003) as cocreators. *Enter the Matrix* quotes content, setting, style, and visualization techniques as well as features story elements and characters from the referred movie, and was released parallel to the movie as a shared media event.

It can be tempting to simply accept a somehow growing mix of camera work between the different media formats of film and video game, but virtual camera implementation has to take the specifics of interactive game spaces into account. Often, the virtual camera is not the single fixed viewpoint to an event but one option among a range of different perspectives. It has to cater to and support interactive access to the game world and thus differs from the single guiding eye of the physical camera. To understand its operation, it is necessary to highlight the low-level parallels and differences relative to established camera work.

Technically, a virtual camera is a 2D projection plane, not a spatial entity in the game space (e.g., Thomas and Haussmann 2005). Thanks to this immateriality, a virtual camera does not depend on any physical mechanism other than the computer hardware it runs on. For example, the use of linear perspective is optional in a virtual camera and the projection plane itself can be reshaped and distorted. A virtual camera is a mathematical entity, not a physical one; it does not record the light emitted or reflected by a certain event, but rather creates a projection of an imagined viewpoint on the monitor. It modifies a light source instead of recording an existing one. All this raises questions about the terminology.

The term "virtual camera" will be used here as a cultural reference. As we have seen, the camera is a creative force in the generation of a spatial experience and a form of narrating filter. The following paragraphs will concentrate on the resulting mediated plane. In other words, the argument does not cover rendering algorithms but the results of these rendering processes. These are the digitally generated real-time moving images that are not approached as technical pixel masses but as pictures.

In order to shape this camera work, virtual cameras can mimic all of the mentioned real-camera behaviors in their presentation of a video game space without any physical restraints. Paradoxically, this freedom of digital cameras can initially result in a shrinking of applied artistic practice. A virtual camera lacks the functional parts of a real camera apparatus that codefine cinematic language. There are no lenses, filters, shutters, no iris, or film stock in a virtual camera; the camera does not weigh anything and does not make any noise—yet all these elements are responsible for a range of cinematic effects and the development of cinema's form. Without these defining features, virtual cameras lack an important incentive for artistic development: the creative encounter with the limitations of the technology. Modern game titles often try to bridge such an estranging difference caused by perfect pixilation and thereby are living proof for Bolter and Grusin's theory of "remediation" (Bolter and Grusin 1999). Virtual cameras can incorporate filmic effects such as lens flare although they do not use any physical lenses that are the technical reason for such an effect. They can present the image in the grainy resolution of low-quality video pictures (see, e.g., the video communicator in *Metal Gear Solid*) although they can render pixel-sharp. Other titles might add artificial cracks and scratches like those that result from the handling of the physical film material (see, e.g., *Fatal Frame II: Crimson Butterfly* [Shibata 2003]) or change from black and white to full color (see, e.g., *Viewtiful Joe* [Kamiya 2003]).

Viewtiful Joe also applies a special rendering algorithm—a so-called 2D shader—that renders a 3D world in a 2D fashion and provides the game's cartoon style. We can find the same effect in titles such as *Jet Grind Radio* (aka *Jet Set Radio* [Kikuchi 2000]), where it cites the aesthetics of graffiti art, or in *XIII* (Barès 2003), where it refers to comic traditions. Through this kind of specialized software, video games can recreate a specific cinematic camera effect or style. The production method is different but the resulting visual effect remains intact.

Through this process of camera remediation, the paradox of the shrinking artistic range is reversed. The mathematical creation of pseudophysical camera effects makes these effects freely available to virtual cameras independent from any physical setting. From the perspective of cinema, the visualization and camera work in a video game is one long, dynamic special effect. The rendering program that simulates a camera in virtual space can change the recording speed, add distortion, or toggle a lens-flare effect independently from any physical setup, during a single take in real-time. Effectively, this enables virtual cameras to deliver more camera effects than a real film camera ever could. Creating the bullet-time effect in *The Matrix* or *Lost in Space* (Hopkins

1998) depended on a complicated technical setup of still cameras and was therefore limited to a certain stage setup. The resulting shots were impressive visual peaks of the film. In contrast, the almost identical bullet-time effect in *Max Payne* is an ever-present option at any location and moment. The exception has turned into a permanently available option due to the different nature of the rendering technique and the continuous and repetitive gameplay. While Neo, the hero of *The Matrix*, discovers his abilities almost by chance and only at the end of the film, the player in *Max Payne* gets access to the bullet-time effect in the first section of the game. The special visual and functional relation between Neo and the space of *The Matrix* is a given normality in the game world of *Max Payne*.

If virtual cameras provide for such a wide field of expressive means, why is it, then, that the camera work of most interactive titles rarely lives up to the visual language of their cinematic references? To trace a brief history and development of the camera work in video games, this argument will look at the de facto use of the virtual camera in video games.

7.4 Use of Virtual Cameras in Video Game Spaces to Date

Researchers at various institutions looked into the use of cinematic styles for virtual camera control and developed different principles to define cinematic camera work in virtual worlds. Approaches build up higher levels “from a set of primitive functions” (Drucker, Galyean, and Zeltzer 1992, 69), establish autonomous “Camera Agents” (Drucker 1994), camera modules (He, Cohen, and Salesin 1996) that can be rearranged in visually engaging ways, and “Camera Creatures” (Tomlinson 1999) that evoke an emotion-driven visual style (see also Tomlinson, Blumberg, and Nain 2000). Others focus on an automated adjustment of camera behavior to certain architectural design (Calderon, Worley, and Nyman 2006) or specialize on a use of established camera traditions stored in an extendable database for faster Machinima production (Elson and Riedl 2007).

The resulting virtual cameras can recreate a known visual style. For example, they might quote Warner Brother’s cartoons as in *SWAMPED* (Johnson et al. 1999), TV-like coverage of football matches (Drucker 1994) or other established visual traditions (Elson and Riedl 2007). Research in this area is without doubt important to drive further development, but true to the focus on consumer-level game worlds, the following chapter will start from the available cameras in video games to extract a basic matrix of video game camera traditions.

A fundamental reason cameras in games are limited in their performance is that the forms of presentation of video game spaces have to support their functionality. Unlike traditional film, which tells a predefined story without interactive access to the content, cameras in video games deliver the cinematic mediation of events as they are instantiated by the interactor in the virtual world. Film cameras do not have to cater to any possible changes of the unfolding events—virtual cameras do. Because they have to guarantee optimal interactive access to the player, many video games rely on very basic camera work—so narrow in scope, in fact, that some of them apply only one point of view during the interactive experience. The genre of the first-person shooter game derived its name from such a camera limitation. Yet, there is a development toward a more complex representation of virtual space via cinematic means in modern 3D video games—even for first-person shooters. The new complexity evolves from basic camera work that has been accepted as game-specific visual tradition. It is an ongoing process, and before the new complexity can be discussed, a look at these traditions is necessary.

Most camera views in video games have to be optimized for the player's interactive access. Because this access includes movement through space, the mobile camera that somehow explores the virtual set is a dominating form in 3D games. Often, the user-avatar operates as a main point of visual interest within the game space and the camera work has to refer to this avatar and establish its position and orientation within the fictional 3D world. To fulfill this task, these virtual cameras have to readjust themselves constantly because their focus point is shifting constantly. In order to avoid too complex camera work that might threaten the interactive access, many commercial video games limit their camera work to four dominant camera behaviors:

- a *following camera* (and related views such as over-the-shoulder cameras)—third-person point of view behind the main user-avatar, found, e.g., in exploration adventure games such as *Tomb Raider* (Gard et al. 1996);
- an *overhead view* on the virtual world (and related views such as isometric style)—often incorporating varying viewing angles, found, e.g., in strategy games such as *Age of Mythology* (Fischer 2002);
- a *first-person point of view*—view of a character inside the virtual world, found, e.g., in first-person shooting games such as *Quake*; and
- *predefined viewing frames* (fixed or moving)—cameras with predefined behavior in relation to the performance at specific virtual locations, found, e.g., in survival horror games such as the original *Resident Evil*.

Another option is the “free camera” that allows for continuous fly-through of virtual spaces and exploration from any perspective (found, e.g., in the real-time strategy title *Ground Control*). These views exemplify the freedom of virtual cameras but—so far—are either separated from the main play event or lack relevance for the functionality (as will be exemplified in *Ground Control* as follows).

The four outlined main camera strategies represent only a marginal part of the freedom available for game cameras, but in practice they form a basic visual tradition that can be traced in many video games. A comparable limitation of point of view can be found in the early years of cinema, when films were one-reelers consisting of a single-take shot from a static camera position that often remediated the view of a theater audience looking at the proscenium stage. Many of Melies’s early one-reelers apply such a rudimentary point of view. From such an early form, cinema grew up and invented its expressive vocabulary through a collaboration of artistic and technological developments. A comparable process of style development and growth of expressive range via technical and artistic advancements can be found in the depiction of video game spaces. The development of elaborate visualization strategies is connected to these graphical improvements in games. Early virtual environments had severe difficulties in presenting a fine-tuned readable space. For example, in tests conducted in early VR pieces, Henry found that users consistently underestimated distances between virtual structures by 20 percent (1992). Back in the early 1990s, Henry suggested that technical improvements of the visual presentation and higher graphical detail might address this problem—and they did. Any experienced *Counter-Strike* player is capable of estimating distances and positions. The ability is crucial to play and succeed in many modern 3D action games. It is, for example, vital for 3D jump-and-run titles for players to read distances between gaps accurately. The improvements of graphical presentation and the richer image space allow for a better, more detailed reading of the game space. They also gave birth to more elaborate camera work within these worlds.

Another reason for the development of more complex camera work is the growing familiarity of players with virtual worlds. Navigating inside the virtual worlds itself was new, unknown, and problematic, and often led to simplified camera work. For example, Satalich argued for early VR worlds that the unfamiliarity of interactors with virtual spaces was an important reason why they had problems orientating themselves in these worlds (1995). Cyber-space enthusiasts tended to demand a consistent first-person point of view to deliver a perspective somewhat like real life (e.g., Laurel 1986). But from the limitations of relatively few worlds inside high-tech labs, game spaces spread

into our living rooms. They taught generations of gamers how to read 3D spaces. Players developed a much higher level of literacy of game worlds. Today, virtual spaces are used to teach students map reading (e.g., the *Wayfarer* project by Ian Raynes [2003]) and to prepare soldiers for specialized missions (Macedonia 2002). As in film, the expressive means of video game space visualization are explored gradually and gradually accepted by the audience. With a growth of both literacy and technical range the camera work can develop further.

7.5 Development of Virtual Cameras in Games

If modern 3D video games have improved their expressive qualities, then we should be able to trace a development from the basic visual building blocks toward more elaborate camera work.

A player of *Prince of Persia: The Sands of Time* can activate a first-person point of view to orient (but not interact), can switch to a predefined “scenic” view to get a spatial overview, stick to the default interactive following camera that circles around the avatar, and can switch to a slightly different view during the game’s fights. In addition, and depending on the system used to play *Prince of Persia: The Sands of Time*, more camera positions can be mapped to buttons and called when needed. Furthermore, the camera does not always remain under player control during gameplay but might jump to a default position for a given interactive situation. For example, certain locations enforce predefined viewpoints that support navigation through a specific passage. In addition, the game features a range of cutscenes, which include so-called event cameras that dramatize the appearance of enemy encounters or spatial puzzles, the solution of a specific challenge, and special fighting moves. Other cutscenes include introductory fly-throughs that not only introduce the level ahead but also the route through it or they deliver “visions” of the next level as prerendered scenes that give a glimpse of challenges ahead at every save point in the game world.

This illustrates the growing level of complexity based on established game camera traditions. Although *Prince of Persia: The Sands of Time* shows a lot of cinematic visuals, it was never marketed as an interactive movie. The advances in camera work might be references to cinematic traditions but are largely seen as game-intrinsic. How did games reach such a level of complexity? To get an overview of the use of cameras in games today, we have to return to the basic camera building blocks and search for their visual developments. The aim is not to discuss a history of video games but to outline the gradual development of visualization techniques. The argument will be that the

camera developed its own presence in the game space and became accessible to the player. Cameras turned into active performers in the game world. They work not only on the mediated plane but also on the rule-driven plane as functional and interactive entities.

7.5.1 Changes to the Following Camera

A following camera is usually tied to the main character and is a prototypical example demonstrating the importance of the mobile camera in video games. In its basic form, it presents the player-avatar and its relation to the space to be explored. Such a basic camera floated, for example, behind the avatar of *Space Harrier* (Suzuki 1985), never granting a view of the hero's front or face. Because *Space Harrier* features a constant forward movement of the hero (and his enormous gun), the virtual camera is likewise constantly dollying forward into the game world.

Super Mario 64 set a defining moment in the development of the following camera. Like *Space Harrier*, the game predominantly uses a following camera's third-person point of view to depict the famous Italian plumber's movement through the 3D world of platforms and pitfalls. But unlike the linear flying path in *Space Harrier*, *Super Mario 64* offers a whole world to explore. It expands the originally 2D world of *Super Mario Bros.* into a 3D game space. That demands new camera strategies to allow for a comparable jump-and-run gameplay. Three main cameras support this transition into 3D: "Mario Cam" (basically a normal following camera), "Fixed Cam" (where the player can fix the camera's position in space and it only orients itself toward Mario), and "Lakitu Cam." The revolutionary Lakitu Cam system of *Super Mario 64* allowed the player to control the following camera and circle it around the main avatar to explore the spatial positioning of Mario in relation to the whole surrounding video game space. The fundamental jump-and-run functionality of the title stays true to its predecessors, but the presentation is improved to support the same basic interactive gameplay features in a 3D game space. To highlight this invention, the game introduces the camera as a character: Lakitu—an occasionally visible camera operator, who follows Mario on his adventures.

Players control both the main hero, Mario, and his camera operator, Lakitu. The camera turns into an active entity next to the avatar. In fact, the active camera can have a direct impact on the entity of the player-avatar. Turning the camera a certain direction in the default setting can also direct the forward motion of Mario. Hero avatar control and control of the presentation are intertwined. The axis between following camera and hero remains the defining forward-pointing vector.

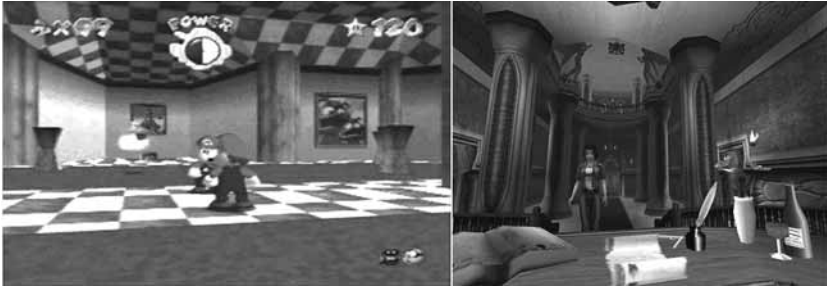


Figure 7.5 *Super Mario 64* (left): Mario in front of a mirror that also reflects his personal camera operator Lakitu; *Zanzarah: The Hidden Portal* (right): a following camera independent of the player-avatar's orientation

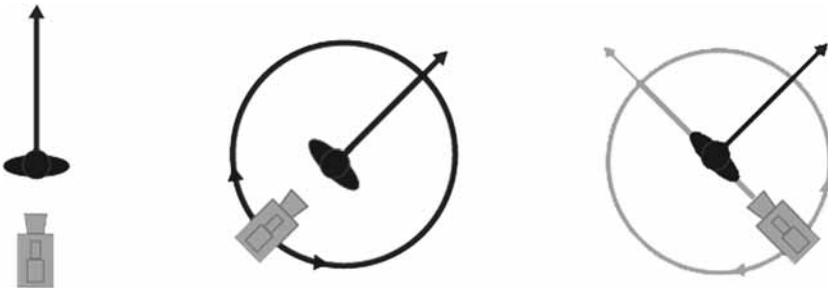


Figure 7.6 Differentiation of the following camera; *Space Harrier*: hero and camera on a fixed axis; *Super Mario 64*'s Lakitu Cam: camera can rotate around hero and also sets direction for movement; *Zanzarah* and *Super Mario 64*: camera rotates around hero independently from movement axis

This axis can also be opened up and made optional. *Zanzarah: The Hidden Portal* features a young girl, Amy, exploring a vast 3D world. The camera is a following camera under the player's control, circling around the exploring girl. But—just as in *Super Mario 64*—when standing, the player can circle the camera around the central avatar without affecting the forward direction. The immediate connection between movement action and camera position—seen in games like *Space Harrier*—is gone.

The result is a very different image composition. Instead of focusing on the background of the image as the visual goal of the main character, such a freely rotating camera opens up the visual exploration of the surrounding game space. For example, the camera can integrate a relevant foreground, goal, or reference point for the character. The player remains focused on the main

character but explores the game environment on both levels: as hero and as detached camera operator.

Finally, *Max Payne* uses different levels of following cameras attached to different subjects. While the game itself is dominated by an over-the-shoulder-like following camera that follows the main hero, a specialized “bullet ride” following camera is automatically activated when a deadly shot is fired at the last opponent of a fight. This bullet ride camera is highly mobile, expressive, and tied into the unfolding event. It ends with a cut back to the character-centered following camera once the dramatic death of the last enemy has been presented using yet another camera. Such a focus on the mobility and speed of the camera recalls the effects of the mobile camera in film as previously outlined. Instead of representing the viewpoint of a flying snowball in *Napoléon*, the camera now follows a single bullet to its target. Gance dramatizes young Napoleon’s strategic ambitions, while *Max Payne* celebrates a player’s victory.

With the assemblage of different cameras and sequences in *Max Payne*, the following camera not only has grown into a player-controlled entity but has also detached itself from the hero-avatar to increase visual impact. From the originally simple traversing of the game space in pursuit of the main character as seen in *Space Harrier*, the following camera has grown to visualize the relationship of the character to the world from variable perspectives, as seen in *Super Mario 64* or *Zanzarah*. Finally, it has started to position itself in a framework of other cameras that add up to a cinematically generated space that can occasionally detach from the main character—as seen in *Max Payne*.

The result is a very different depiction of the game space and a different cinematic space. The monotonous fixation of the early *Space Harrier* following camera on a game character supported a singular action in a simple game world. The *Super Mario 64* camera supports an explorative style to show the character in his relation to a more complex game world where the player gains control over the visualization axes between camera and hero. Breaking this axis allows for a double exploration, as seen in *Zanzarah: The Hidden Portal*. The camera operates more independently from the hero-avatar and provides a visual stimulus under the player’s control for further visual world exploration. The space just ahead of the character is visually accessible, as well as the whole surrounding—independent from the main avatar’s orientation. *Max Payne* exemplifies an end to the single focus and a cinematic game world presentation that depends on editing and a combination of cameras. The moving camera explores a range of spaces (that of the hero, of the last bullet, and a set scene) from which the player has to reassemble the game space.

The development of the following camera over time, thus, is a widening of the spatial representation. The changes allow for a wider range of presentation techniques of this space and thereby enrich the visual vocabulary of video games. Modern following cameras can be more complex, explore more spaces, and provide a richer experience of a video game space. This increase of expressive range emerges from closer connections between three planes: the rule-driven, mediated, and fictional. While *Space Harrier* remains on a basic rule-driven and simplified mediated plane, *Super Mario 64* and its successors shift emphasis onto the mediated plane as the camera is acknowledged as its own entity. Reading this space and forming the fictional plane can be enhanced by more camera detachment and the end of the domination of the single long shot as seen in *Max Payne*.

7.5.2 Changes to the Overhead View

The overhead view consists of a viewing position that hovers above the virtual playground. The player is looking down onto the events on the surface of the virtual world below. It resembles the perspective of a general on a tactical map or a goddess to a world below her feet and it does not come as a surprise that this is the camera featured in many tactical sim games and so-called god games. The initial form detaches the player from the game space. One example is the isometric view.

Isometric views eliminate any distortion of the depicted shape caused by the perspective. There is no single focal point that would help to concentrate the picture or fixate its orientation.

True isometric views are an artistic construct and always include a level of abstraction, because the real world is not perceived in that way. Isometric drawings are used for technical descriptions and can trick the view in



Figure 7.7 *Q*Bert* (Intellivision port of the original game by Davis and Lee 1982) as example of a true isometric view (left); *Warcraft: Orcs and Humans* as example of direct top-down view with false isometric effect (right)

Escher-like visual impossibilities. Because of the square pixels that are the smallest visual unit for most video games, the result of true isometric perspective can lead to awkward pixilation especially in older games and many have instead opted for a different angle.

Any of these overhead views—isometric or not—exclude complete examination of the world because the player cannot get closer or change the basic setup. The introduction of fully navigable 3D game spaces to god games changed that.

Many virtual worlds have changed from 2D to 3D spaces. But do they truly adapt to the new conditions of 3D space in presentation and functionality? *Warcraft III: Reign of Chaos* (Prado 2002) consists of a fully navigable 3D world and allows changing views of this world while its predecessors *Warcraft: Orcs and Humans* (Fitch et al. 1994) and *Warcraft II: Tides of Darkness* (Millar et al. 1995) were limited to isometric views faking a 3D view. The 3D space of *Warcraft III* or *Age of Mythology* allows the player to “move into” the game space. It can take interactors almost to ground level and thereby changes their positioning from god-like generals to co-heroes in visual terms. This unlocks new gameplay possibilities and variable player positioning.

But *Warcraft III* does not utilize the new possibilities offered through a flexible viewpoint in its functionality. The game neither encourages the interactor to actually use the ground-level camera, for example, to find a certain item only visible in a closer view; nor does it define the ground-level view as the only available visualization for one particular mission or parts of a mission to change the game experience. Instead, players can finish the game without ever changing the camera view or even realizing that this option exists in the game. Likewise, *Age of Mythology* fails to utilize these camera options. The game uses a complex narrative setting that includes flashbacks and dream-like levels, but the newfound visual freedom of its 3D presentation is never enforced through the camera to support these situations.

In contrast, Tong and Tan argue that the free overhead camera in the game *Ground Control* (Walfisz 2000) “is not only vital to the enjoyment of the game but also serves as an important measure for effective gameplay” (Tong and Tan 2002, 106). Their analysis, especially of the heightened aesthetic value of the experience, is persuasive. Their detailed examples, though, indicate that the de facto value of the free camera for the functionality in *Ground Control* is limited to an “alternative to performing a more logical yet uninteresting aerial scan of the location” (ibid., 108). It is neither a necessity nor a dramatic improvement. Unlike the cinematic camera, where the choice of viewpoint is a crucial narrative element, the breathtaking freedom of the virtual camera is reduced to an “alternative” or optional feature. It is not connected to the

interactive access or narrative stance and remains on the level of an aesthetic effect with little impact. The expressive range is widened but not in combination with the functionality of the title and thus it remains pointless. *Warcraft III* and *Age of Mythology* both feature complex narrative settings and occasional search missions in which the player is confined to very small resources, at times controlling only one character. But the games still apply the same camera work used in the great battle scenarios with numerous entities under the player's control. The camera is free, but unlike in film the new freedom remains unexplored.

A main reason for this lack of direction is the missing reference point to a single character. The plan view of the battlefield remains functionally neutral and no single object or character is supposed to visually dominate. *Warcraft III* and *Age of Mythology* use the notion of heroes as special characters that provide a narrative framework but usually are not acting alone and often remain just one unit among countless others on the virtual battleground. Unlike the focus of the following camera, there is no fixed binding to a specific user-avatar. Thus, direction of the camera work has to rely on other attractors: one can call a view to the home location in *Warcraft III* via a button click; or jump to the position of the current enemy attack as well as to any hero or unit under one's command. Whether it is the most valuable object or a regular unit, the camera does not distinguish between them, rate them, or build up dramatic connections between them. Neither does it concentrate on any single location on the map. The camera can jump anywhere at any time—like a finger does when pointing to different attractions on a map. This enhances the functionality but does not develop the expressive range as the camera view stays in the overhead position.

Metal Gear Solid offers a wider cinematic range of camera angles tied to the main character based on a hybrid overhead-view/following camera. Unlike in god games, where the player can usually select and affect a lot of different characters, the stealth agent Solid Snake is the only player-controlled character in *Metal Gear Solid*. The dominating perspective in *Metal Gear Solid* is that of an overhead view that focuses on this main character. It is closer to the ground than the standard viewpoints in *Age of Mythology* or *Warcraft III* and shows every detail of the game world so that the player can interact with it yet is high enough to provide a strategic overview. A number of additional cameras are available to support the dramatic presentation. For example, the player can switch to a first-person perspective at any time. Other cameras are connected to the position of Solid Snake within the virtual space. The view closes in whenever the main character hides close to a wall, and jumps back to the overhead view whenever the avatar is moving through open space. The

spatially conditioned camera connects the player's movement to the visualization; the rule-based plane connects to the mediated plane. This dynamic and conditional camera work precisely answers the call for better implementation of a more expressive virtual camera.

These cameras are not optional but integral elements of the game. Interactors cannot succeed in *Metal Gear Solid* without activating these views, as some elements of the fictional world cannot be experienced without them. To support this more directed camera style, the interactive access of the user to camera control is more limited than in *Age of Mythology*. Players of *Metal Gear Solid* usually cannot zoom in or move the camera independently from the main avatar or another in-game reference object. Instead, cameras are applied either as direct interactive access (players can activate the first-person point of view) or indirect consequence (the user-avatar's position within the game spaces activates a different viewpoint) in a meaningful and dramatic way. *Metal Gear Solid* indicates that different camera settings can be combined with a dominant overhead view—at least within a character-based setting. Instead of staying detached from the virtual playground, such elaborate camera work can draw the interactor closer to the event both in terms of visual representation as well as functional access. The cameras offer a more flexible and dynamic visual relation to the game space.

7.5.3 Changes to the First-Person Point of View

Adding more dynamic camera work to first-person point of view titles seems to be the hardest task. Because the basic functionality of these titles stays often very fixed, so does the camera and the way the game space is delivered by the presentation. The first-person point of view is usually tied to the view of one fictional character (or object) that operates inside the video game space and under the control of an interactor. Again, technical limitations were part of the development of the visualization strategy.

Titles such as *Battlezone*, *Castle Wolfenstein 3D*, and *DOOM* (Romero et al. 1993) offered a first-person point of view restricted to two axes. Players could not look up but only move “into” the screen horizontally. In *Battlezone*—arguably one of the first first-person games—players control a virtual tank and the camera work mimics a periscope-like view into the video game space. In an interesting combination of play space, mediated space, and fictional space, some of the original arcade cabinets include an artificial periscope that frames the monitor.

This assigned first-person point of view can only be controlled along the horizontal plane. Players can rotate and dolly the virtual camera forward and backward by navigating their tank and exploring the video game space. The

periscope interface itself seems to explain the limitations at hand. On the one hand, such a limitation can be attributed to technical constraints; on the other hand, we face again the question of literacy. Ed Rotberg—*Battlezone*'s lead programmer—also developed a free camera that would navigate much more freely for the flight simulator *Red Baron* (Rotberg 1980). *Red Baron* uses basically the same circuit board as *Battlezone* and the same vector graphics. It would seem that this camera should have been far more effective, released almost at the same time as the limited *Battlezone* view. Yet, while *Red Baron* was no failure, it did not repeat *Battlezone*'s triumphant success. The reasons may be legion but one might be the lack of game space literacy in players. In this dawning of 3D game spaces, players still had to learn how to read and interact with the 3D space at hand, as it was presented in abstracted vector graphics as in *Battlezone* and *Red Baron*. *Battlezone* offers environmental features that provide cover from enemy fire and other structures that support orientation (including an active vector volcano). The restrictions of the periscope seem to aid comprehension of these elements and the navigable 3D space. Interaction with them fit the audiences better than the *Red Baron* visualization with its freer camera movement.

But as games developed their visual language, they gradually improved players' media literacy. 3D game engines using polygons followed (e.g., *F-19 Stealth Fighter* [Meier 1988]). Lights and colors became available in the game space through textures and sprites (e.g., *Castle Wolfenstein 3D* and *DOOM*) before textured polygons allowed for a game world with multicolored surfaces (e.g., in *Strike Commander* [Roberts 1993]) and lighting features advanced further expressive qualities in these specific game spaces (e.g., with *Quake*'s light maps). Ever since, this polygonal form has been under constant refinement and improved in detail and graphical richness. But what has changed in regard to the first-person perspective itself?

Pure first-person games such as *Return to Castle Wolfenstein*, the successor to the original *Castle Wolfenstein 3D*, rely exclusively on first-person cameras throughout, interrupted only by the prescribed cutscenes that use multiple cameras. Both *Wolfenstein* titles were graphical milestones and exemplify the spectacular improvement of 3D engines. However, while the quality of the graphics available in the game world has improved significantly, the expressive freedom of the camera work has stalled.

The slow rate of change in first-person camera in the first-person shooter is connected to the slow changes of the functionality of these titles. Players constantly readjust their views in *Return to Castle Wolfenstein*; they continuously scan the virtual world for foes, friends, and useful spatial structures. The main task of the player is to shoot any approaching enemy and avoid their

attacks—the same basic setting can be found in *Battlezone*. What improved graphics provide are a higher quality of the same basic gameplay functions and a much finer granularity of these functions. The games' functionality and visual expression has not widened but deepened.

Navigating a character like a virtual camera through a game space closely resembles the work of a camera operator. The interactor has become the man with the movie camera as proposed by Vertov. But Vertov's *Man with a Movie Camera* celebrates the camera operator, stages him as the hero of the piece, at times highly visible. In contrast, most first-person shooter games hide the player-character. A more recent—and fitting—and cinematic reference that plays with this hiding effect can be found in the *stalker* film tradition. Stalker films had their peak in the late 1970s and early 80s and gave birth to formulas, later serialized, such as *Halloween* (Carpenter 1978) or *Friday the 13th* (Cunningham 1980; Dika 1990). Although the use of a horrifying stalking camera had been applied earlier, the visual presentation at work in the stalker tradition makes the first-person camera formulaic. It introduces patterns. For example, Clover highlights the changing use of first-person point of views in the slasher/stalker films when the camera enters the viewpoint of the victim—Clover's "final girl"—or that of the killer. "The 'eye' of the camera is collapsed into the 'I/eye' of these characters. Whereas the killer's point of view dominates the first part of the film, in the latter part (when the final girl shifts from victim mode to that of hero), she gains control of the view or gaze" (Ndalianis 2004, 118, referring to Clover 1992, 45). We find Clover's final girl in many survival horror games, but a particularly direct reference is found in *Fatal Frame* (aka *Project Zero* [Shibata 2001]). The *Fatal Frame* series expands the theme further in its sequel, *Fatal Frame II: The Crimson Butterfly*, where the final girl is doubled into the "final twin sisters." In *Fatal Frame III: The Tormented* (Shibata 2005), the player controls return again mainly to one woman, although *Fatal Frame III* also includes control over a male hero for the first time in the series. These games follow Clover's theory of a combination of the hero view and the empowerment of the final girl to become an active hero. They generate this shift through a connection of the rule-based and mediated planes. The dominating viewpoint is that of predefined viewing planes, but whenever the player activates the game's weapon—a magic camera—the game switches into first-person perspective. The moment of "fighting back" is the moment of the heroic first-person point of view. It depends on actively changing the view and preparing the weapon. The *Fatal Frame* series combines a first-person point of view with predefined viewing frames based on a visual tradition established in

earlier survival horror titles such as *Alone in the Dark* or *Resident Evil*. How do pure first-person titles evolve in comparison?

In games that rely entirely on a first-person perspective we might read a shift of the player-character, often from the unarmed, helpless, and hunted to the fully equipped killing machine at the end of the game that also reflects the player's growth in experience. In the beginning of *Unreal* (Blesninski and Schmalz 1998) or *Halo: Combat Evolved* (J. Jones 2001), the player is inexperienced and the virtual hero is helplessly unarmed, but soon they start to gather an arsenal of weapons and the player gradually learns how to master them. The view stays consistent, but the dramatic position of the hero changes from victim to killer, while the game space changes from threat to familiar and mastered ground.

In parallel, the basic shooting view is enriched through different views, such as a sniper view, virtual night vision, or other effects, which allow for a more complex visualization. Movement in three dimensions also allows for more complex interaction with the environment, using it as cover or even element against the enemies. The first-person camera is the optimized view for many of these tasks, and changing the view can jeopardize the functionality of important design elements, such as precise shooting. That is why first-person camera games often reject any fundamental changes, but offer refinements through these kinds of visual enrichments. A case in point is the *Call of Duty* series, which offers increasing improvements of the visual display of a first-person shooter game while holding onto a rigid interaction design as it continuously restages (predominantly World War II, although the latest installment is set in a modern-day war scenario) battles.

This kind of limited visualization often has more in common with theatrical, not cinematic, presentation forms. *Half-Life*, a successful video game often credited for its cinematic qualities (e.g., Mactavish 2002), includes prescribed action sequences that the player encounters in a consistent first-person point of view. These events share qualities with theatrical staged actions—like action-themed *lazzi*—enacted on the virtual stage of the *Half-Life* world. While any movie would elaborate these events via visual foreshadowing, a climatic buildup through different visual means, and a cut once the event has been resolved, *Half-Life* does not incorporate any of these visual strategies. In this regard, players of *Half-Life* are not participating in a film but in a play. Because of this lack of editing, the game space in *Half-Life* is a virtual stage, not a film set. The same is true for *Call of Duty*, where the scripted and unscripted AI behavior can be so massive and widespread that the player is bound to miss the details. The stage is too big and

too active to be fully comprehensible, and the game space diverts clearly from cinematic space in its abundance of action.

But one can find the occasional cinematic effect even in this kind of pure first-person game. For example, in the midst of what could be called the first act of *Half-Life*, the player is teleported back and forth between two different worlds—the virtual earth and an alien planet. In cinematic terms the teleportation constitutes a cut because it is a change of location. Likewise, *Deus Ex* features a cut that mimics the unconsciousness of the main hero: at one moment, the player-character is overpowered and the view fades to black, only to fade back into the view of a prison cell in which the hero is being held. Here the cut is a fade and indicates a change of time and location. More often, though, game designers limit spatial navigation in order to shape the perception of prescribed events. In those situations, players control their view but are restricted in their avatars' movements. Designers shape the possible views available to the player by means of stage design and spatial conditioning.

For example, during the opening sequence of *Half-Life* I control the character of Gordon Freeman, whose background is gradually revealed to me as he travels on a moving monorail wagon into the fictional Black Mesa Research Facility and right into the heart of the adventure. During the ride I catch countless little events through the wide-open windows of the monorail: scientists seem to prepare experiments, robots transport goods, guards are on duty. All of these events are prescribed to provide an atmospheric introduction to the game world. My viewpoint is roughly defined by the position and size of the monorail wagon that continues to take my hero further into the core of the fictional world. However, the precise orientation and detailed position of this view is left to me as I control Freeman's movements and views inside the monorail carrier. I steer the avatar inside the limited space of the wagon and become an active witness of the events happening around the carriage.

One could speak of a “narrating architecture” that enforces a certain vision through the limitation of the spatial practice within it. The world takes the player for a ride like a linear amusement park. Visually, the effect in *Half-Life* mirrors the long opening shot used to establish a certain location and setting up to the beginning of the main events as seen, for example, in *The Player* (Altman 1992), which itself quotes Welles's *Touch of Evil* (1958). Other games apply these kinds of guided visual introductions at different dramatic moments. The form seems to create its own tradition. Instead of a cutscene we encounter a gameplay scene that blends elaborate staging and camera restrictions with some interactive access. *Half-Life*'s successor, *Half-Life 2* ties the player to a prison-like transporter pod to stage the level transition and final twist in the

plot. The player cannot move but looks around to watch while computer-controlled game characters and co-heroes perform the (almost) final plot revelation. *Prey* (Rhinehart 2006) uses a comparable prescribed “ride” to introduce a main switch in location when the hero and his friends are abducted and transported into some alien mother ship—again in the tradition of a spatially restricted interactive establishing shot. One could argue that *Half-Life* established the restricted first-person point of view as an interactive and visual tradition in first-person shooter games.

The D-Day level of *Call of Duty 2* (Rieke 2005) fades in as I control a soldier on board a landing boat approaching the French shore. As mortars explode and machine gun fire rips through my virtual fellow soldiers, I dash forward to find cover. But I cannot avoid stepping too close to an explosion and my virtual hero is knocked over. The first-person point of view and audio simulate a shell-shock effect of the main character lying helplessly paralyzed on the shore. But I am picked up by a non-player character, dragged to safety, and healed. Only then do I regain control over the virtual hero’s movements. Again, movement and behavior are restricted to establish a dramatized new context. Here the effect is less of an introductory shot but more of a visual exclamation mark emphasizing the chaos of the situation as well as the community of virtual soldiers.

The tradition has become so accepted that some first-person video games can add directed force to it. They gradually adjust the player’s/character’s viewpoint and direct the attention to specific elements in the game world. If *Super Mario 64* introduced a detached third-person perspective, then these games establish the first-person point of view as a distinct camera entity—somewhat detached from the player’s control and with its own will. *Breakdown* uses a constant first-person point of view and uses spatial design to structure the presentation as well as functionality. For example, when hit, the avatar’s body might shake uncontrollably, or when drugged, the avatar might be paralyzed. The title features prescribed cutscenes from the first-person point of view and visual effects that support spatially restricted interactive vistas.

In addition, *Breakdown* enforces gentle camera adjustments to indicate important events. Unless the player counters these movements, the game has sections where the view is directed and staged—much like the events in the prescribed moments. In contrast to *Half-Life*, attention in *Breakdown* can be focused by the computer and not only left to the player. The player is free to override such adjustments at any point, but the camera nevertheless expresses its own logic. One remains the “man with the movie camera,” but the camera apparatus, the impersonated virtual character, starts to gain

its own will, which allows *Breakdown* to accentuate special elements in the game world.

To summarize, the developments of the first-person point of view remain character-centric but elaborate on the possibilities of staging this character in more precise and dramatic moments in the game world. The game world itself is consciously used as a form of visual frame for the presentation and some indicators point back to a direct control of the image. Combinations of all of these features introduce a more structured and dramatized version of the seemingly player-fixated first-person point of view.

The changes in the presentation of the first-person viewpoint in regard to the game space are connected to the virtual hero body and the player's mastering of this body in the game world. The better the player becomes, the more the same space might change from a threat to a kind of "killing playground." While the camera stays the same, its visual-narrative stance changes. The second option is to affect the virtual body, the man as the camera, and thus shape the visualization. This is often accomplished with a technical add-on (like a sniper view using different optics), a physical impact on the body (like spatial limitation of the view by limiting navigation), or a change of the perception (like adding a filter or distortion to simulate a different state of consciousness). In this way, the flexibility of camera work is thrown onto the virtual body. While the overall visual principle might remain the same, the state of the body as a simulated spatial entity inside the game space gains relevance for the visualization. The tightly knit dependency between rule-based and mediated plane through this focus on the virtual body situates the camera in the game world. However, when the view is adjusted by the computer and the camera seems to develop its own logic, we even notice an emerging camera entity from within the original first-person concept.

7.5.4 Changes to the Predefined Viewing Frames

Static, predefined viewing frames have the advantage of offering optimized and perfectly framed views of a given area. They are largely precoded in their position and behavior. Because of the game system's control over these cameras, these visualizations can quote cinematic shots and make the best possible use of the set and its lighting, effects, and staging. In other words, predefined viewing frames allow for an optimized *mise-en-scène* in game spaces as in film sets. Such optimization can direct attention in a highly dramatic way.

Thanks to this optimization, *Alone in the Dark* or *Resident Evil* can reference horror movies like Romero's *Night of the Living Dead* (1968) as each view can be arranged by the designer in a way comparable to that of a film director or director of cinematography (see, e.g., Krzywinska 2002, 209). Virtual

lighting, set design, staging, and effects are designed to reinforce one subjective viewpoint and to achieve the best dramatic impact for the visualization according to cinematic convention. Predefined viewing frames might appear to be the most cinematic visual approach of the four basic camera positions defined earlier, but they can also include technical limitations. Many older titles—including *Resident Evil*—use prerendered images as backgrounds. Using this technique allows for a higher graphical detail but constrains the camera to one fixed viewpoint, as any movement would reveal the lack of true perspective and missing parallax effect. Such a camera is technically confined to a static view.

A most memorable scene of the original *Resident Evil* game uses this static visualization: I am steering the main hero down a corridor while the camera remains at the entry point to the hallway. At the end of the corridor I can sense a corner, and as my hero approaches this corner I expect the cut to a new camera angle showing me the space behind it. Instead a pair of vicious dogs suddenly crashes through a window in the foreground and starts to attack.

The interesting element here is that the camera allows a staging of this surprise attack in the foreground. The enemy invades the space between me, the player, and the hero standing with his back to the attackers. The space between hero and camera—between hero and player—becomes the danger zone.

A more recent installment of the franchise, *Resident Evil 4* (Matsushita 2005), also plays repeatedly with the visual connection among danger element, hero, and player. Its camera is more dynamic and mainly moves along predefined patterns in relation to the progress of the main hero. At times, navigational control is taken from the player and replaced by Quick Timer Events (QTEs) that use very different functionality. QTEs change the interaction



Figure 7.8 *Resident Evil* details; use of foreground for action (left); example for predefined viewing frames and use of light (right)

mode of a game from in-world interaction to a kind of reaction and matching game that asks the player to press a certain combination of buttons as fast as possible to trigger often very specialized and predefined action sequences. Players often do not know what these inputs will actually trigger. Because this is a space-independent reaction test during which other interaction modes are paused, the virtual camera is free to work its magic.

After fighting my way through a village packed with deadly half-human enemies, I find myself at the starting point of an empty path that winds down a hill. Stepping forward triggers a QTE. A short cutscene shows some remaining villains pushing a giant boulder down a cliff. The boulder crashes onto the path behind me and starts rolling toward my hero as well as toward me, the player, because the camera is in front of the virtual hero. The shot cites the opening sequence of *Raiders of the Lost Ark* (Spielberg 1981). Like Indiana Jones in one of the seminal shots of that movie, my hero has to run toward the camera. *Resident Evil 4* delivers an even more continuous shot as the camera dollies backward to keep the view. So while I bash buttons to make my hero run and escape the danger, the camera continues to show the boulder closing in on the hero as well as the camera in front of the running character looking back at the action.

Ico (Ueda 2001) offers a different addition to predefined views as it uses cameras tied to special positions within the game space and triggered by the spatial progress of the player-character. The game allows players to rotate and pan the view from that given position as well as to zoom in to the player-avatar. As in *Super Mario 64*, the camera behavior is potentially detached from the hero-character and is its own interactive entity. The active camera is still triggered by the avatar's position in the level but its orientation and zoom are—within limits—accessible to the player. The result is a smooth, almost unrecognizably complex and highly effective visualization. The preset view prompts the player to recognize the spatial puzzle at hand as seen in *Prince of Persia: The Sands of Time*. It can emphasize thresholds to overcome or paths to take. The camera is mobile to keep the hero in view and in the necessary relation to the set spatial puzzle. At the same time, the player has limited control over the camera's orientation. This allows visual exploration of the game space in the search for the next clue in the spatial puzzle setup of *Ico* beyond the predefined frame. Often no camera adjustment is necessary to solve a certain puzzle but as the understanding of spatial connections is at the heart of *Ico*, the limited camera control allows for a “closer look” and more independent exploration that, in return, support the necessary planning of the route ahead. Players engage not only as active navigators but also as visually exploring camera operators in the game space.

Ico is also an interactive example for Monaco's "open form" of framing as the player-controlled camera can lose sight of the main avatar. "Open and closed forms are closely associated with the elements of movement in the frame. If the camera tends to follow the subject faithfully, the form tends to be closed; if, on the other hand, the filmmaker allows—even encourages—the subject to leave the frame and reenter, the form is obviously open" (Monaco 2000, 185). Any game using predefined viewing frames can feature this kind of openness because it can depict movement through the frame and toward the image borders. But *Ico* expands this notion. Now, the player can direct the camera in such a way as to lose sight of the hero and instead concentrate on the surrounding game space. The character does not move beyond the frame; the frame leaves the character. Players even continue to control their avatar off-screen. Once again, camera and hero control are detached from each other.

Preset viewing frames have developed from single perspectives tied to certain locations, to mobile cameras dynamically tied to locations and avatar positioning, to interactive cameras partially dependent on the character progression. Such a development greatly improves the available range of camera work depicting the character inside the game space and changes the player's own relation to the game world through the new interactive access. In games like *Ico*, the player controls once more both the movie camera and the subject of the shot. Such a setup implies a high level of literacy and control—a level that can allow not only for new visualization but also gameplay, as the predefined camera itself can become an object of gameplay.

The survival horror title *Eternal Darkness: Sanity's Requiem* (Dyak 2002) projects the "sanity" of the game character onto the camera work, which mainly consists of predefined mobile cameras. Whenever the game hero encounters too many disturbing incidents without mastering them, the sanity level decreases and may affect the visualization of the game world as well as the behavior of the hero. The camera can tilt, additional frightening elements may become visible, the screen may simulate a failure and display computer system error messages, the hero may shoot into the camera leaving buckshot holes in the screen of the player, and other effects might be used. Through such complex visualization, the game "plays the player" (see Perron 2005), and it does so through an interesting use of visualization strategies. *Eternal Darkness* gives the camera its own physical substance. Buckshot holes on the screen indicate the presence of a monitor. This opens up a new layer for the game visualization that plays with the mediated space and the screen itself and reaches out of the rule-driven and fictional space into the play space.

First, the gradual development of the predefined viewing planes toward a richer, even self-referencing camera supports the spatial cinematic expression

of this visualization. Players engage with foreground, background, and even off-screen spaces. Second, these visual developments exemplify the maturing of the camera work that transcends different spatial planes. Players complained about the arrangement of predefined cameras in the original *Resident Evil* game, as the camera viewpoints occasionally lost track of the player or attacking enemies. However, losing sight of the hero or limiting the viewpoint's functionality for the player can become an interactive option in *Ico* or an expressive option in *Eternal Darkness*.

The growing complexities within the four basic camera styles indicate that emerging visual styles promise to be far more varied and richer in expression than the original basic cameras. The cameras themselves have become accessible and their operation is now part of the play experience. Highly developed cameras become play elements themselves. These cameras have turned into performers, comparable to player-avatars but with a different task. They do not affect the action but narrate the event. In this function they can play the player. They play with a guided presentation that enforces certain viewpoints or are played by the player within given limits. Opening up the narrating to the interactor and implementing complex and interactive camera controls includes the player in the process of the game space narration.

Space is still told and presented in this narrating stance. But it can include players in the process through advances in the four basic cameras. It seems that with growing literacy, the player is allowed to step beyond the *fabula* creation and also gains access to the narrating process. The rules that empower the virtual man with a movie camera are the new paradigm for creating a visual engagement with the player. The question is not only what events players can affect, but also what visual contexts of such events can they create in the game space.

7.6 Performing Cameras

The interconnection of action and presentation shifts the virtual camera from a presenting device to an interactive cocreative one. Cameras and actors are involved in a constant, dynamic, and often player-triggered spatial ballet. The more the player gains control over the viewpoint, the less this ballet can be predicted.

The handheld camera can draw the audience into the event space through the sheer involvement of the camera in that space. In the rape scene of *A Clockwork Orange* (Kubrick 1971), the camera is in the midst of the crime, almost as another rapist; *Raging Bull* (Scorsese 1980) pulls the camera into the boxing ring and into the fight; in *Festen* (Vinterberg 1998) (as well as in

other *Dogme* films) any use of tripods is forbidden and the camera reacts to the spontaneous and often improvised scenes. However, the image in all these examples remains fixed, and the final negative is absolute.

While the film camera offers a fixed image, the virtual camera can team up with the player during the game. Both can be seen as actors collaborating during the creation and narration of an event. With the growing control of the player over the camera entity, the performance for the player becomes a dual one, simultaneously controlling the main actor as well as the camera's point of view.

7.6.1 Virtual Camera as Performer

Machinima has been defined as “animated filmmaking within a real-time virtual 3D environment” (Marino 2004, 1). Machinima producers usually utilize 3D game engines as video production tools and create video pieces from games as performance spaces. *Performing cameras* are typical for Machinima productions that often use human users as camera operators to record events in a virtual world. Often the game engine does not allow for any other approach, as seen, for example, in the *Halo* game engine, which led to performing cameras in the *Red vs. Blue* series (Rooster Teeth 2003–2007) or the *Halo* talk show *This Spartan Life* (Burke 2005–).

Thanks to the improving qualities of these engines and the development of specialized tools for Machinima, but most of all due to the growing body of work, this technique is gaining acceptance as a subcategory of computer animation (Salen 2002; Marino 2004; Lowood 2005, 2006; Nitsche 2005a, 2007a). Game developers support the use of their engine for Machinima in new installments of their software. The *Unreal* engine's incarnations from *Unreal Tournament 2003* (Bertucci et al. 2002) to *Unreal Tournament 2004* (Bleszinski and Morris 2004) to the new *Unreal 3* engine continuously improved features for Machinima production compared to their predecessor, the original *Unreal Tournament* (de Neve et al. 1999). The same rings true for other games: *The Sims 2* (Bradshaw 2004) offers superior movie features compared to its predecessor; so does the *Source* engine of *Half-Life 2* in comparison to the original *Half-Life* engine (formerly based on the *Quake* engine), and newer installments of the *Halo* engine.

Creators of Machinima record their virtual performances live from these engines on video or digitally capture them frame by frame to create consistent film clips; or they provide the entire performance as a data log file that reproduces the dramatic events in the engine accordingly. It is during these live recordings that Machinima exemplifies both the power and limitations of the performing camera. The participants not only have to stage the actors'

performances, but also generate appropriate camera work, often directed by an invisible camera operator. Camera movements, then, are implemented via the movement and orientation of this camera operator who literally embodies the viewpoint. These actors have little or no other functionality in the game space apart from presenting it in an engaging way. Vertov's kino-eye has found its perfect form as virtual, often-invisible witness with potentially unlimited freedom.

Many Machinima productions are created in this fashion including the live productions of the ILL Clan's *On the Campaign Trail with Larry & Lenny Lumberjack* (ILL Clan 2003–2004) series as well as its *Tra5bTa1k* series (ILL Clan 2005–). These live recorded Machinima productions use improvised acting performances and capture them through an extra camera operator. Other Machinima pieces like the seminal *Red vs. Blue* series use the same approach but add more postproduction.

While *This Spartan Life* and *Red vs. Blue* are staged in the relatively rigid game engine of *Halo* and in fixed game levels provided by the developer, the ILL Clan created custom-made virtual worlds for its Machinima series. These copy television studio setups and often play with their qualities such that it has become something of a trope to reveal the spaces' artifice. At the end of *On the Campaign Trail with Larry & Lenny Lumberjack* (performed at the Machinima Film Festival 2003, New York), the characters step out of their fake framing and reveal the visual tricks that defined the 3D environment that was modeled for the show. Then the main characters leave the virtual sound stage through the virtual backdoor. The ILL Clan's preference for playing with TV conventions led to a recreation of the traditional recording space that replaces the usually much wider original game worlds. The game as TV world has become a topic for its shows. Breaking this recording space closes the argument and brings it back to the merger of film sets and game world. As the player control has expanded into the camera work, the game space has turned into a film set. It may come as no surprise that some artists would model their virtual set after its real predecessor.

7.6.2 Cameras in Casablanca

In 2002 and 2003, two Machinima experiments were conducted at the University of Cambridge during which we tested the effect of the performing cameras on the surrounding game world. Students had to deliver their own interpretations of a given scene and soundtrack from Curtiz's film classic *Casablanca* (1942). They had to perform their vision of the same scene in a game environment (using the *Unreal* engine 2002 and the *Virtools* development kit 2003) created by them especially for this occasion. The camera and

editing was controlled by a live operator, who adjusted the shots during the performance in the virtual world. The operator was an invisible entity present on the virtual stage, whose positioning, orientation, and movements through space constituted the final visual interpretation of the performance.

The students initially developed their various camera strategies through storyboards before the actual stages were modeled. Once the virtual stage was assembled and rehearsing started, the camera work was refined by the camera operator. Due to manifold—mainly technical—reasons, the performances of the virtual actors were often slightly “off.” Actors could not find their positions in space or had difficulties with their animations. In spite of these complications, the flexible camera operator was able to capture the scene, not unlike the recording of an improvised scene in a *Dogme 95* production where framing and mise-en-scène are very dynamic and difficult to predict in detail.

To some extent, this kind of camera adjustment is the reversed form of the meticulously preplanned long takes in traditional film productions. The continuous long shots of Hitchcock’s *Rope* (1948) or the first-person point of view of Montgomery’s *The Lady in the Lake* (1947) work because the film sets and the actors’ performances are optimized for the camera. Meanwhile, in our experimental digital setup the planning was less meticulous and the performance more improvisational. As the workshop setting forced students to perform their scenes live with a lot more limitations, the acting was far less precise. But the freedom of the virtual camera somewhat countered this lack of precision. The laws of the physical world restrict the studio camera’s performance. Hitchcock had to use extreme precision in the stage design and operation for *Rope* to make sure that the predefined camera movements could unfold on the stage. The virtual camera in a Machinima production might perform in a comparable “live” way but is not confined to such physical restrictions. Instead, it has a greater freedom in its own movements and performance range.

The virtual stage design had to incorporate this freedom. The original set design for *Casablanca* (art design by Carl Jules Weyl, sets by George James Hopkins) already featured larger-than-life proportions with high ceilings and archways. Now, the space had to be shared with the virtual camera-performer and the performances developed from ballet-like arrangements between the acting characters and the recording camera. Because the camera could freely move in any direction at any time, even more space was necessary in the virtual reinterpretation to accommodate the new freedom.

While the shots were set up in traditional ways, the evolving camera style of any of the four student groups during the two runs of the *Casablanca* workshop did not refer back to the classical Hollywood style, which dominated the

original movie. Instead they used more of the long takes typical for *Rope*, although the group only watched the original *Casablanca* for inspiration. Both *Rope* and *Casablanca* were based on plays; Hitchcock's *Rope* is an adaptation of a Patrick Hamilton play of 1929, and Curtiz's *Casablanca* was based on Murray Burnett and Joan Alison's unproduced *Everybody Comes to Rick's*. Thus, an element of theatrical performance could be traced in both, even though the camera work in both films differs significantly.

In the *Casablanca* workshop, the camera operated much more in the long-take tradition of *Rope*. The number of cuts was considerably lower in the virtual camera work: in the first experiment (conducted in the *Unreal* engine), both groups used only seven camera cuts in comparison to the twenty-five cuts used in the original *Casablanca* film scene. But the virtual camera also differed in its operation from the camera work in Hitchcock's *Rope*. The virtual camera related to the other two characters in the scene not as an overseeing, all-knowing entity but as an involved character and witness. While Hitchcock uses the camera to intensify the feeling of suspense in the audience, often emphasizing important clues in the murder case that are not visible to the characters in the event, the virtual *Casablanca* camera was more reactive in relation to the actors and went much more with the flow of the action instead of guiding it.

On the one hand, performing cameras highlight specifics of the visualization of video game spaces (a mobile camera, long continuous takes, direct visual involvement, high flexibility); on the other hand, they quote classic cinematic camera work on various levels and divert from the original game perspective. The first workshop used the *Unreal* engine, which is dominated by a first-person point of view. Yet, the first-person point of view was used briefly only once by one group in the *Casablanca* experiment, while more traditional cinematic strategies dominated throughout.

Whether in the development of the basic camera vocabulary, or in the game-based film productions, each form showed that virtual spaces incorporate elements of classical cinematic mediation and theatrical performance. The results clearly support the thesis of a rich cinematic vocabulary at work during the discourse, which can be utilized to create a perspective to the unfolding interactive events. Virtual cameras support the references between the avatar body and surrounding space and position the player in relation to this space. But interactive cameras are only one piece in this process. The remaining challenge for this development is the *combination* of meaningful dramatic camera work—the editing of different virtual camera perspectives into longer sequences.

7.7 Editing Space

Game spaces became too large for a single screen and had to be broken down into smaller chunks in the presentation. That meant that players could only explore a subsection of the overall game space at any single moment and the presentation addressed this in various ways. *Intellivision World Series Major League Baseball* (Daglow and Dombrower 1983) allegedly was the first game to use different perspectives toward a single event. Multiple cameras were integrated, fragmenting the interactive playground into separate images from different viewpoints. This introduced the cinematic element of montage to games. From that moment on, players had to connect those images to form a whole game space in their fictional space—their imagination of the game world. This corresponds to an audience reading a filmic space, but there are significant differences between montage in film and video games that complicate a direct transfer.

Montage in film is understood as the technique and result of selecting, editing, and piecing together separate film clips into a linear sequence. Montage in film operates through fragmentation and assembly. The editor takes parts of recorded shots and assembles them into a new whole. It is the “creation of a sense or meaning not proper to the images themselves but derived exclusively from their juxtaposition” (Bazin 1967, 25). In contrast, 3D video games generate the picture on the fly, usually picking from a number of viewpoints that perform in space just like the main characters.

Contrary to postproduction editing in film, the editing of a game event happens in real-time. The virtual editor (human or computer) activates a new virtual camera at a different location within the video game space. However, this camera will only render images if activated. There is no selection of images available after the fact of the performance. While such an operation still provides for a telling of space via moving images, it complicates the traditional categorization of montage as a *result* of the editing. Following this logic, Manovich identifies an “anti-montage tendency in GUI” (2001, 143). But montage as process and *modus operandi* remains an active force in games. Moving images are assembled and the resulting montage remains not only aesthetic but also functional in the generation of the fictional space. Poole recognizes this but argues that camera work in games differs from that in film, as it should use only the “most useful angle” (2000, 93). Yet artistic implementation can surpass and question such a plain “usefulness.”

Two elements of editing in video games and their effects on video game spaces will be elaborated to illustrate the value of editing in the visualization

of video game spaces: first, the creation of impossible spaces through editing, and its resemblance to film's continuity editing; and second, the element of interactive montage and its connections to a more montage-like visualization.

7.7.1 Impossible Spaces in Text and 2D

Non-Euclidean space had been applied to new media a long time before 3D virtual worlds came into being. The interconnection of different rooms or locations is not restricted by physical logic in hypertextual forms, MUDs, and text adventures. That is why they can easily generate seemingly impossible, fictional diegetic spaces. In these *impossible spaces*, the interlinking between different lexia is conditional and not logical. The effect can be used to generate impossible but meaningful virtual structures. Anders points toward the MUD structure of the virtual Alcatraz location within the *BayMOO* textual world that consists of a closed ring of virtual rooms with no way out. Players can enter the Alcatraz node from a virtual San Francisco node but cannot get out except via teleporting (Anders 1998, 161). The quality of a prison is simulated in an eternally looping node network. In that way, descriptions of non-Euclidian space can very well depict certain qualities, bending but not breaking the overall coherence.

Video games also featured impossible spaces during their 2D era. The “tunnel” of *Pac-Man* connected the left and right screen exits of the *Pac-Man* maze together. It seemingly wrapped the space of the virtual playground together to a cylindrical form to allow the user's almost immediate appearance on the left side when moving through the right tunnel entrance. Extending this wrapped space effect, the original *Asteroids* game used a 2D playground with a spherical projection plane. Whenever an asteroid disappeared beyond the frame it reappeared on the opposite side. This should not be misunderstood as a merely technical issue of render algorithms; it is predominantly an issue of spatial design and understanding. This impossible space is part of the core gameplay and a fundamental part of the highly abstracted world of *Asteroids*. Poole refers to such spaces as “space purer than any that exists in the real universe . . . a pure dream of unhindered movement and harmonious action” (2000, 129) and contrasts them with the hyperrealistic representations of environments in modern games.

Once the virtual playground outgrew the single screen, impossible spaces were presented in the combination of different screens. The “Blue Labyrinth” in the Atari 2600 *Adventure* (Robinett 1978) includes impossible jumps and interconnections between different passages of a 2D maze. It creates a wrapped spatial construct based on five different screens that are interconnected in a

non-Euclidean way (see also Wolf 2002, 62). Their inconsistencies are camouflaged with a cut: the jump from one screen to another. Like in the hyper-textual Alcatraz example, locations can be arranged in a mathematically conditional way. There is no spatial connection between these data files, only a mathematical one, which allows a designer to interlink them in any way. Visiting players do not experience these spaces as separate from each other, as their user-avatars are “teleported” to new locations and the fragmentation of the virtual environment is hidden with the basic camera cut to a different screen. We do not see that the camera cheated on us during the telling and generation of space, but only perceive the illusion of a continuous world.

The camera cuts to a view of this avatar in the new space and hides the spatial distortions behind a visualization that simulates spatial consistency. In this way, cinematic techniques can enhance the spatial coherence of video game spaces that are edited into one perceived entity. The effect points toward continuity editing that “reinforces spatial orientation” (Bordwell, Staiger, and Thompson 1985, 55), while the de facto connections between different spaces can defy the nature of architectural and spatial logic.

7.7.2 Impossible 3D Spaces

Like game worlds, cinematic spaces are assembled from fragments through editing and allow for impossible spatial configurations. David Lynch’s feature film *Lost Highway* (1997), for example, creates illogical spatial structures through editing, supported by lighting and camera work. Branigan refers to these as “impossible’ spaces,” that is “*space which can not be justified as existing wholly within the diegesis*” (1992, 44; italics in original). These spaces lead to perceptual problems “that force the spectator to reconsider prior hypotheses about time and causality” (ibid., 44). They disorientate and destabilize the audience as the spatial, and often the temporal, connections are broken. Such destabilization is applied to achieve effects serving the narrative and its dramatic impact. The result can be a feeling of being lost in a maze—as in *Adventure*—being trapped in a prison—as in the *BayMOO* version of the Alcatraz prison—or being trapped in time—as in the role of Fred Madison, one of the protagonists in *Lost Highway*. This strategy is also available in 3D video game spaces. One question in the *Common Tales* project was how a 3D game world can carry a narrative through spatialization. The main setting focuses on the relationship of the two main characters, who are literally from different worlds. To illustrate their differences, we created a specific level, the *Cube Club*, that tried to represent the continuity of space as well as this fundamental difference in the main setting. Like the 2D maze of *Adventure*, the *Cube Club* level, consists of several separate structures. Each individual

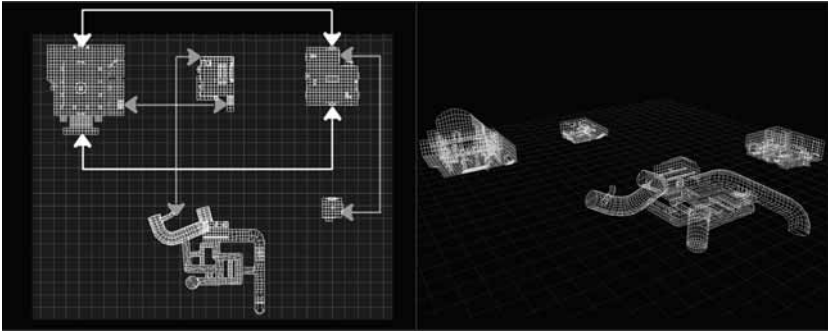


Figure 7.9 *Common Tales*: the *Cube Club* level 3D overview (left); connections between separate spatial units (right)

structure is connected to another via invisible “teleporter zones” that instantly reposition the player-character in a new area. Camera cuts disguise any transition from one part to another, supporting the rules of cinematic continuity editing. Consequently, the interactor can experience the whole game space as one coherent location.

The *Cube Club* level demonstrates that this seemingly coherent space can in fact create spatially illogical constructs through cinematic mediation. In this level, two opposing doors from one virtual room lead to similarly opposing doors in a different room. When an avatar leaves the first room through the northern door, he or she will enter the seemingly adjacent second room, also through the northern door—the same way the southern doors are connected. Both rooms occupy the same logical space—a physical impossibility. Camera cuts hide the transition effect and create the illusion of a coherent space. The core concept of *Common Tales* dealt with fictional characters coming to life once their stories are told. These characters, then, meet the “real life” in a magical reunion. This magical, yet impossible combination is spatially represented in the *Cube Club* level and the impossible space becomes an evocative narrative element. The impossible space is motivated by the game’s setting. In *Common Tales*, the effect enhances the magical character of these rooms, which are symbols for the main conflict between the central characters. The impossible space embodies the underlying theme through its spatial arrangement and cinematic mediation.

Other examples of physically impossible and virtually accessible spaces include mismatched interior and exterior of 3D structures: a virtual building’s interior architecture can be larger or smaller, or it can suggest a different shape than the exterior form indicates. These spaces can also alter spatial

interconnections: stepping through the same door twice might not lead to the same virtual space, turning around might not lead back into the space the character just came from. The game *Portal* (Babbar et al. 2007) builds its core gameplay principle around the question of entry and exit points of teleportation “portals.”

Unlike the wrapping space of *Asteroids* or *Pac-Man* or the discontinuous labyrinth of *Adventure*, the “impossible space” of *Common Tales* is not only a functional gameplay feature but also part of the title’s dramatic and narrative setting. There is a reason for their spatial behavior that goes beyond immediate functionality. The higher level of complexity provided by the free camera and the larger game world might call for a more elaborate explanation of the impossible space or at least some form of contextualization. Like continuity editing in film, this complexity can become a valuable arena for spatialized narrative. Continuity can be applied, broken, or played with to enhance certain qualities of a game.

One way to break this logic is via inconsistent spatial behavior of in-game characters. So far, the teleporting of the main hero was used to connect places and provide the impression of one continuous world. But teleportation can also be used to break this illusion. In the survival horror game *Fatal Frame II: Crimson Sacrifice*, some enemy ghosts can teleport themselves to different positions within the game world. Such unpredictability destabilizes the player’s projection of events and raises the difficulty level of any fight. The player-character’s space itself stays intact, but the spatial behavior of enemies within it becomes illogical. This affects the player’s perception of the environment. In *Fatal Frame II* the player has to frantically scan the environment to find the teleported ghosts again, who could literally appear from any direction. Like Lynch’s *Lost Highway*, the spatial connections of the fictional world are out of balance. The game space becomes more insecure through the impossibility of spatial behavior. Until I have learned the teleportation patterns of each ghost I cannot establish a stable fictional framework for the ghost’s behavior. Moreover, my own character’s consistent spatial movement emphasizes the mismatch.

More often, though, editing supports the creation of coherent space, even if there is none. As outlined earlier, this copies the effects of continuity editing. It rarely ever copies the diversity of this visual Hollywood camera technique, though.

While continuity between different shots in a traditional film is generated with an elaborate camera work that often combines establishing shots of a location with more focused closeups of the actors and their relation within it, games often remain on the level of the establishing shot, stringing one after

the other in the succession of one game location to the next. These open establishing shots have their value for the presentation of the game space. They keep the interactive options open by presenting a relatively large portion of the game space. But how can we expand the montage of the game space and add more virtual cameras to the expressive mix? The following paragraphs will argue that more complex montage works especially when the editing is driven by the player's actions.

7.8 Interactive Montage

In *interactive montage* every cut is initiated by the player and is an essential element of the gameplay. Strangely, montage as a *play* element has not been developed from a ludic perspective at all. Yet it is here that event creation through interaction and cinematic visualization meet, merge, and generate new effects. Players not only affect events inside a game space but also the presentation of these events. Any “annihilation” (Eskelinen 2001a) of a discussion of moving image features in video games would be misleading. At the same time, any approach based predominantly on film theory risks remaining detached from game specifics. Instead, the place in between the two poles is seen as the most fruitful area for an argument. A range of possible interactive montage elements can be found in this area; the complexity of *Prince of Persia: The Sands of Time* or *The Metal Gear Solid* series grows from combinations of system-driven and interactive montage. The following pages will refer back to the initial distinction into four basic camera viewpoints to describe more elaborate editing in game worlds.

7.8.1 Basic Matrix

The four initial and basic camera positions have been defined as: the first-person point of view, following cameras (and related views such as over-the-shoulder cameras), overhead views (and related views such as isometric style), and predefined viewing frames (fixed or moving). A primitive matrix and starting point for an analysis of interactive montage should start from these basics.

Most of these cuts have been mentioned already but are here combined in a basic matrix to illustrate the growing range in montage in games. There is no limited list of possible cameras in film nor is there one for video games. For the time being, this matrix is derived from the previously introduced basic virtual camera distinctions in games. It is not a definitive list of all visualization or editing methods in games. There are already various limitations for

Table 7.1

	First-person point of view	Following camera	Overhead view	Predefined viewing frames
First-person point of view	<i>GoldenEye 007</i> sniper view			
Following camera	<i>Siren</i> “sight-jacking”	<i>Max Payne</i> “bullet ride”		
Overhead view	<i>Doom</i> map view	<i>Metal Gear Solid</i> “sneaking camera”	<i>Age of Empires</i> location jumping	
Predefined viewing frames	<i>Fatal Frame</i> photo view	<i>Prince of Persia</i> scenic view	<i>Incubation</i> turn execution	<i>Resident Evil</i> location jumping

such a matrix: these cameras are only referred to as visualizing the video game space and do not include interface options outside this game space (such as loading screens); the setup does not exclude but neither does it specifically develop the element of split-screens in games (e.g., map inlays); and—as has been outlined—all of these cameras have seen considerable developments that blur the borderlines between them. Many of the following examples have already been introduced but describe the basic matrix:

- First-person point of view to first-person point of view—example: *GoldenEye 007* (Hollis and Mikell 1997) includes a sniper view that cuts from a first-person point of view to a zoomed-in view through the sniper rifle’s scope. The cinematic pendant would be a zoom cut—a rare feature.
- Following camera to first-person point of view (and back)—example: *Siren* (Toyama 2004) gives access to multiple first-person perspectives as a main gameplay element through a “sight-jacking” feature. While the exploration phases of the game are presented in a following camera style, sight jacking allows the player to look through the eyes of the enemy creatures lurking in the dark ready to kill the player-character. Players have to switch between these points of view, understand the levels and the dangers within each, and create an escape strategy.
- Overhead view to first-person point of view (and back)—example: in *DOOM*, the seminal first-person shooter combines his game world with a vector 2D map overview. Notably, the view is not merely representational as

the player stays in control of the avatar and can explore the world further. In fact, finding secret passages often depends on the map view.

- Predefined viewing frames to first-person point of view (and back)—example: the *Fatal Frame* series combines predefined camera angles during the exploration phase and user-triggered cuts to a first-person point of view during the fighting phase. In this case, the first-person viewpoint is motivated by the game's weapon: a photo camera.
- Following camera to following camera (and back)—example: *Max Payne's* “bullet ride” cuts from a following camera of the main hero to one of the last deadly bullet fired in a fight sequence. Although the bullet ride itself is not under player control, the final shot triggered the cut, and only if the condition of a successful hit is given is this special camera activated.
- Following camera to overhead view (and back)—example: *Metal Gear Solid's* camera is active whenever the hero hides behind walls. Large parts of *Metal Gear Solid* are played in a kind of close-range overhead view that provides the necessary tactical perspective to the environments. Whenever the hero comes close to a wall and crouches at it, the view changes to an alteration of a following camera to show the relationship between character and surrounding space in greater detail.
- Following camera to predefined viewing frames (and back)—example: *Prince of Persia: The Sands of Time* includes a scenic view of each location that can be activated by the player at will, while the dominant presentation form is in a following camera perspective. The player stays in control of the character at all times.
- Overhead view to overhead view (and back)—example: *Age of Empires* uses an inlay overview map that provides interactive access to a jump from one overhead view (the only available viewpoint toward the diegetic video game world in this game) to the parallel view setup but onto another location of the world. The cut can be tied to special locations (e.g., one's central home castle) and mapped to special keys.
- Overhead view to predefined viewing frames (and back)—*Incubation: Time Is Running Out* (Nitsche 1997) is a turn-based strategy game that allows players to plan their next turn in an overhead-like free-camera view. During turn execution, though, the camera jumps to procedurally generated viewing frames in the 3D world. While players lack any direct interactive access during this turn execution, they are drawn closer into the game world by the camera work and are visually repositioned from the role of an external general to that of a participating fighter.
- Predefined viewing frames to predefined viewing frames (and back)—example: *Resident Evil*, which triggers new cameras dependent on the player's

spatial progress. Every location has at least one predefined view associated with it that gets triggered when the player-avatar enters this zone.

7.8.2 Operation via Spatial Reinforcement

Although the visual language of video games often relates to cinematic styles it is obvious that very few of these editing strategies simply copy cinematic traditions. One basic difference is the repetitive nature of editing in games.

There are cinematic parallels to every camera view previously outlined, but few of these cinematic references apply them as rigorously and exclusively as games do. For example, the bullet ride in *Max Payne* refers to the visualization style in John Woo movies, but it operates not as a rare dramatization and peculiar high-pitched abstraction of the action scene but—over the course of the game—as a repetitive signal for the end of many fights. The player will see more bullet ride shots in *Max Payne* than in all of John Woo's films combined. Likewise, the sniper rifle view is present in cinema, and might be an important element in films such as *Enemy at the Gates* (Annaud 2001), but like Woo's bullet ride, the film applies it as a rare peak in the visualization of the event. In video games the sniper view might have a comparable effect, taking the viewer closer to the target, changing the speed and dramatic tension level, and creating a visual intimacy with the victim, but it is also a repetitive perspective encountered countless times in the course of the games like *Call of Duty* and *Quake*.

So how does interactive montage with its cuts operate during gameplay? And on what grounds does it add up to a consistent whole for the presentation of the video game space?

Despite its rarity in film, the sniper rifle cut became an instant classic and omnipresent feature in first-person shooter games. On the one hand, this can be attributed to the new function in the gameplay: the introduction of the sniper rifle with its different play options. On the other hand, on the visualization side, this is owing to the reinforcement of the player positioning in the game space through the interactive cut. The sniping view reinforces the position of a virtual character—that of the sniper. Through its visual concentration, it not only creates an intimacy with the target but also implies one with the sniper. The cut therefore reinforces the position and orientation of the player-character within the game space. It creates a close connection to the play space of the interactor: whenever I activate a sniping view in a game, I find myself at one end of the periscope. Accordingly, the cut builds on the established game setup and becomes accessible in return. Interactive access and player positioning are applied and reinforced.

The same spatial reinforcement is at work in the *Fatal Frame* series. Again, the game montage differs from cinematic traditions and might even contradict or threaten established rules, but ultimately enforces the interactive experience of the game space. The main gameplay sections of spatial exploration in *Fatal Frame II* are presented in predefined viewing frames. In most cases it is during these set perspectives that the player encounters an enemy. This establishes a certain axis of action, namely the line between the player-avatar and the approaching enemy. The defining visual element of *Fatal Frame* is the ability of players to switch into first-person point of view at any moment, even if the resulting cut threatens the basic cinematic prohibition against crossing the axis of action (Nitsche 2005c).

Whenever I activate the first-person point of view through the weapon camera, I also trigger a cut to the character's point of view and *onto* one point of this axis. Depending on the avatar's orientation, the result might be highly disorienting. The whole setup is far from Poole's "most useful" view or a Pudovkin-like optimized observer perspective (Pudovkin 1958). Instead, it can demand frenetic adjustment of the viewpoint to align to the axis of action necessary to master the situation. This task becomes even more difficult due to minimal lighting and lack of visual landmarks, as well as the necessary timing of the best possible shot depending on the enemy's behavior. To achieve the highest impact of my photo attack, I have to wait for a painfully short shutter frame that differs between the various ghosts I encounter. Mastering the first-person point of view becomes an integral part of the game's functionality and gaming experience, comparable to mastering the movements of Lara Croft during her exploration of the levels in *Tomb Raider* or the mastery of the weapons in *Quake III: Arena* (Devine, Carmack, and Cash 1999). Ultimately the cut does not violate the spatial continuity but instead operates *with* it to enforce the player positioning and dramatize the game experience.

DOOM's 2D map exemplifies the same reference to position and orientation. An arrow indicates the player-avatar's position and orientation in the game space. Because the player stays in control of her avatar, *DOOM* allows for a relatively seamless montage between the 3D first-person point of view and the 2D map overview. Limited field of view, difficult orientation, bending of basic cinematic rules, or minimalist 2D vector graphics do not lead to an incomprehensible montage as long as the spatial continuity between point of interactive access and cinematic visualization is guaranteed.

Instead of an assembly of different visual attractors, as suggested by Eisenstein (1957), the player-character position is the single most dominating reference for these cuts' efficiency. Because this character is under the player's control, it is not the camera that guides the viewer through the space

but rather the player that guides the camera. How applicable are traditional film theories to the features of interactive montage outlined in this new setting?

Elements of Bazin's realist cinema seem to be closest to the demands of such an interactive montage. In particular, his demand for long takes, eye-level camera perspectives, and unobtrusive editing often also apply in games (1967). Such a reference makes sense in the light of the new "reality" that gameplay constitutes, and its simultaneous visualization.

The reinforcement of the player positioning through interactive montage has been identified as the key element for the evolving visual assembly. Interactive access and spatial reinforcement are the joints around which this kind of interactive montage develops and forms a new game space. Where these joints are threatened, the visualization can become illegible.

Siren illustrates that these references cannot be taken for granted. Using multiple first-person points of view in combination with following cameras, *Siren* asks players to orient themselves in the game world through complex and changing visualizations. The game includes a *sight-jacking* option that allows the player to look through the eyes of the enemies in order to recognize their position and behavior in the game world. The goal is to plan a secure path through the enemy territory for players' protagonists (shown mainly in a following camera style). The problem is, whenever players sight-jack they lose control over the spatial navigation. One might look through the eyes of an enemy but the artificial intelligence of this enemy still controls its movements and behavior. Instead of achieving a spatial reinforcement, the comprehension of space is threatened. Neither the hero(es) nor the enemies can be directly controlled in that view. The visual result is less legible as the player has difficulty knowing through whose eyes the world is presented and where this viewer is positioned or oriented. The weakening of the player positioning makes this game one of the hardest to play in its genre. The problems of playing *Siren* do not grow from the idea of sight-jacking—which was praised by critics and players (see, e.g., www.metacritics.com)—but from the difficulties in comprehending the montage as a consistent fictional space. The interactive feature was laudable, its visual implementation too demanding. One interpretation would be that *Siren's* visualization is too advanced for today's players and that—with improved literacy as well as improved graphical quality—the feature might become more accessible. Interactive access and spatial reinforcement might be temporary cornerstones for montage in games as they—and their audiences—develop further.

Sound in Game Spaces

After the image and the image arrangement, audio stands out as the next dominant presentation form of video games. Our bodies hear before they see, and acoustic signals are constituent parts of our understanding of our surroundings. Not surprisingly, they are also part of our expectations of video game spaces. Sound guides interactors to understand the game events and to construct a meaningful comprehension from the action. Although the use of sound may have been primitive at first, it has been part of the game space since the earliest days of *Pong*. It has always been a layer for evocative narrative elements. As with the virtual camera, there is no “natural” listening position in a video game space, but like the camera, the sound “tells” the space to the player. Sound implies the position of a virtual listener in the game world and shifts the player into that position. Any audible element has to be designed and implemented in the game space to support the positioning of the player-listener. Like the presentation of the visuals, this use of sound leads to a certain perspective.

In cinema, sound can guide the audience’s perception of the image and the event, and as such it plays an important part in the diegesis of the perceived fictional world. This chapter describes how a comparable effect is achieved in games through four different elements from sound effects to the overall mix. Technically, video games can apply spatial sound, Dolby surround, and other formats such as THX; they can deliver live sound broadcasts, sound playing from a CD/DVD/Blu-ray, sound filtering, sound-generation, and real-time mixing, among other features. Thanks to this toolset, sound in games can reach the acoustic quality of film, depending on the hardware of the speakers and sound card. Four elements of sound in game spaces will be discussed in the following chapters: effects, music, speech, and soundscapes.

8.1 Sound Effects

Sound effects have come a long way from the early titles such as *Pong*, which featured the name-giving abstract sound effect; to the elaborate and multilayered sound design of modern computer games such as *The Lord of the Rings: The Two Towers* (Epps and Kojder 2002). The latter claims to have 130 sounds loaded into the PlayStation 2's RAM at any moment during the game (Boyd 2003). Their development toward ever more realistic soundscapes has been so successful that some already call for a revision of the trend.

Opposing a tendency to extremely naturalistic sound sources, Poole calls for less naturalistic and more artistic acoustic effects (2000, 80). He envisions such sound effects would work like the elaborate yet often highly abstract soundscapes of David Lynch's films. At the same time, Poole praises the limited sound capabilities of early interactive titles, which forced designers to develop unique and specific sound effects rather than quote realistic sources, thereby generating something entirely new that suited their limited capabilities (ibid., 80–84). His argument strikes a chord, as those early limitations have led to signature tunes and effects. The early phase of 8-bit video games was extremely limited in the use of audiovisual effects. Sound-effects design in landmark titles such as Miyamoto's original *Super Mario Bros.* was limited but became famous, even genre-defining. Those effects have been referenced in other media. That is why the movie *Super Mario Bros.* (Jankel and Morton 1993) quotes the distinctive sound style of the underlying video game, *Super Mario Bros.*, in order to reference the fictional world of the game. In this case, the level of abstraction provided the necessary unique identity, which itself does not simply mimic real-world effects. Marty O'Donnell, audio director for Bungie, argued for the sound design for *Halo 2* (J. Jones 2004): "Real-sounding is not *good*. It's just real. Real is boring. We want sound to be *visceral*" (Waugh 2005). To achieve this visceral effect, there is also an argument for at least associative/realistic sound design that mimics physical sound sources and behaviors. The recognizable sound of an artificial waterfall adds significantly to the sensual quality and presence of its visual representation in virtual space; the sound of a gunshot adds presence to an artificial gun being fired; the sound of a virtual car engine becomes much easier to read when it mimics real-world behavior (see, e.g., Rowland 2005). Exaggerating these sounds can emphasize their immediate impact. In these cases, sound not only helps to distinguish objects within space but also provides an association with a real physical sound and allows for the projection and fast comprehension of the simulated situation. This might support functionality; for example, the realistic sound of a virtual car in the *Gran Turismo* series can indicate the speed and

condition of the vehicle and thus support the player's comprehension of the situation. At the same time, sound can create spaces. Like in film, where sound "can solicit us to construct space" (Bordwell 1985, 118) and "personalize" (Bordwell, Staiger, and Thompson 1985, 54) this space, sound can characterize virtual space and objects within it. Police cars are identified by their sirens in films as well as in video game spaces (e.g., throughout the *Grand Theft Auto* series) and in the real, physical world.

The sirens have a dramatic, yet differently motivated impact in all three worlds. However, they are all based on the real-world siren model. All three use real-world references in the identity of a sound to simplify categorization. As objects become more and more distinct, game spaces can become more cluttered. Thanks to this kind of sound-guided categorization, objects remain legible, and surrounding space is easier to understand. Influenced by Kevin Lynch's work on cognitive maps, Darken and Sibert introduced and tested an "acoustic landmark" (1993, 3) to virtual spaces. Their experimental world showed that the combination of visual and audio cues enhanced orientation in virtual environments. This work is reinforced by other findings proving the importance of spatial sounds in a virtual environment navigation system for the blind (Loomis, Golledge, and Klatzky 1998) and Koh and colleagues successfully included spatial sound in their tests of virtual spaces as simulators for spatial training (Koh et al. 1999; for further reference, see also Loomis et al. 2002). These projects indicate how important the connection is between spatial navigation in the visual 3D world and the sound world. Some games use this connection and open the soundscape of a 3D game world to interactive exploration. The 3D video game *Enemy Zero* (Eno 1997) experiments with this setup.

Once again I find myself trapped in an alien-infested spaceship. Whenever I roam the corridors I explore the ship in a first-person point of view. But the visuals will not help me during an alien attack because the enemy is invisible. The only way to sense aliens is through an acoustic sensor device, modeled after motion-detection devices used in the comparable setting of *Aliens* (Cameron 1986). Any enemy in front produces a high sound; a low sound indicates an enemy coming from behind; and mid-range sound indicates an attack from the side. My relative position and orientation inside the virtual spaceship directly impacts this perception. Through the soundscape, enemies gain presence in relation to me, the player. In return, they increase the sense of my spatial positioning and orientation within the game space.

But not all video games want to simplify the reading of the game space—auditory or visual. Games that play with the element of horror, which is assisted by a certain dislocation of the player, can use the sound layer to cause

deliberate confusion. The highly abstracted and expressive sound effects of *DOOM 3* (Willits 2004), *Silent Hill*, or other horror titles already realize what Poole called for: imaginative nonrealistic use of sound effects as artistic expressions. These games often use extremely distorted or reversed sound effects to heighten the discomfort of the player. David Lynch used the technique of backward-played sound and action famously in the “red room” scenes of his *Twin Peaks* series (Lynch 1990–1991). The audience/player cannot place or fully identify these kinds of distorted sound effects but is forced to try again and again, as many of the other sounds (footsteps, closing doors, squeaking floors in *Silent Hill*; guns, explosions, technical machinery in *DOOM 3*) pull the player back into a realistic frame. The conscious waging of one against the other, the familiar against the incomprehensible, shapes the sound design of these titles and forces the player into an active-listener position that becomes an integral part of a highly engaging experience. *Silent Hill* incorporates this effect and integrates it into the game world itself. Early on in the game, the player finds a seemingly dysfunctional radio receiver that turns out to be an important piece of virtual equipment. Like the alien-motion detector in *Enemy Zero*, the radio operates as an acoustic enemy detector and emits white noise whenever enemies are nearby. The effect is enhanced by limited sight as the game often uses fog or light effects to restrict visuals. But white noise itself is defined as an equal use of all frequencies, and a listener cannot distinguish any single sound in a white noise signal. The effect is that the player of *Silent Hill* is forced to concentrate on a basically incomprehensible sound effect to deal with the game world. It is a very effective trap in the form of presentation. But even if the sound object is less obvious than seen in *Silent Hill*, the player cannot escape, for as O'Donnell argues: “The eye blinks when you turn your head to look at something else, but the ear never blinks. We are working hard with the programmers to make certain that there are no seams in the soundtrack—no moments of dead silence that will break the spell of the sense of place” (1997, 638).

O'Donnell acknowledges the importance of sound to create a “sense of place”—here in the context of the game *Riven* (Miller and Vander Wende 1997). This points back to sound as part of the telling of a space and highlights its value for a player's immersion in the fictional world. As Darken and colleagues discovered while looking for quantitative measures of presence in virtual environments: “for most mainstream applications, sound should be considered an essential component” (Darken et al. 1999, 13). Indeed, its absence usually causes irritation.

Any visible rain effect without the appropriate sound has to appear unnatural to an interactor, just as movements without the sound of footsteps or forests

that bar any audible birds leave an eerie feeling of artificiality. Sound effects are part of a virtual world's identity and they dramatize the individual object in the virtual space as well as the position of a listener within this space. As a result, spatial comprehension and dramatic contextualization are essential tasks of sound effects in video games.

8.2 Music

As Goldman wrote: "Music in film *mediates*. Its nonverbal and nondenotative status allows it to cross all varieties of 'borders': between levels of narration (diegetic/nondiegetic), between narrating agencies (objective/subjective narrators), between viewing time and psychological time, between points in diegetic space and time (as narrative transition). Finally, the connotative values which music carries, via cultural codes and also through textual repetition and variation, in conjunction with the rest of the film's soundtrack and visuals, largely determine atmosphere, shading, expression, and mood" (1987, 30; italics in original).

Music operates as a powerful but often hidden mediation tool (Lack 1997). Chatman even argues when watching a film "if we started *listening* to the score, it would probably mean that we had lost interest in the narrative" (1990, 9; italics in original). Like films, video game titles use specially composed and produced soundtracks to support the setting and evocative narrative elements. Trent Reznor is one example of an artist crossing the boundaries between media. He is a musician in the worlds of commercial music with his band Nine Inch Nails, film music, and game audio. In 1996 he collaborated not only with Lynch to produce the soundtrack for *Lost Highway* but also with id Software as video game music producer, when he composed the entire score and the effects of the original *Quake*. Reznor's industrial sound has left its mark on both pieces.

Even where the sound quality of film or television is not matched, musical motifs can still transcend, from film to video game, and connect both. The original *Star Wars* (Lucas 1977) soundtrack composed by John Williams is included in many franchise computer games, including *Star Wars: TIE Fighter* (Holland and Kilham 1994). Here, the reappearance of the film's soundtrack is of obvious inferior quality, but the recognizable musical pattern provides a unifying element between the film and the computer game. Players familiar with the film expect a certain fictional world to be connected to this soundtrack and are preconditioned to read the game as such. This expectation transcends media and can be used for dramatic purposes in the fictional virtual worlds. It also indicates the value of music in games for the creation of a context or atmosphere.

Combining the music with the moving image to set the atmosphere is more complex in games than in film. While the latter allows a picture-perfect match to the photographed action, games allow users to change the timing of events, demanding an immediate reconstruction of the musical score. That is why *Myst III: Exile's* (Saunders 2001) linear main orchestral scores are used only in the prerendered video sequences, where no interactive access is granted (Wall 2002). In games players decide what happens, where, when, and how. It is not easy for the musical score to predict, foreshadow, or support the event and set the necessary atmosphere. Bessel even argues that “too literal an attempt to adhere to film-music practice seems at the moment to be restricting innovation in this area” (2002, 142). With reference to the serialized musical approach of Boulez, Bessel praises the musical score of *Alien Trilogy* (Nagy, Michael, and Shea 1996) consisting of two independent sound loops that combine to unexpected results and form this title’s background score. He suggests that their changing sound combinations work in a “more successfully filmic manner” (2002, 139) than the linear, and clearly Danny Elfman-inspired score of *Medieval 2* (Shepherd 2000), composed by Andrew Barnabas and Paul Arnold. It should be added, both composers were clearly aiming to achieve an Elfman-esque film score, so the result is by no means accidental. Both titles represent different philosophies in game music. How to balance those poles? What are the expressive means of music for video game spaces and how can it incorporate the element of—especially spatial—interaction and exploration?

Some games depend on a combination of music and interaction: rhythm games let players participate in the event on the acoustic layer. In this very successful genre the order is reversed. The player has to follow the music in games such as the *Dance Dance Revolution* series, *Donkey Konga* (Endo 2004), or *Guitar Hero* (LoPiccolo and Kay 2005). Players follow a set of given patterns that are displayed largely independently from the surrounding visuals. They usually follow the z-axis into the screen, as in *Guitar Hero*; the screen’s horizontal x-axis, as in *Donkey Konga*; or the screen’s vertical y-axis, as in *Dance Dance Revolution*. But the patterns have little connection to other graphics displayed on screen. The surrounding space of the image and the game world can be reduced to eye candy as only the simplified track of music drives the action forward. Many of these rhythm games feature ingenious interfaces (dance mats, guitars, bongos, maracas, microphones, drumsticks) that shape the play space but are limited in their impact on the virtual space in the game. The interfaces are so specialized for musical purposes that other forms of interaction like navigation and camera control are reduced.

When these interfaces lack the direct appeal of the tangible “real world”—as in *Amplitude* (LoPiccolo 2003)—the result is far less engaging.

Amplitude—a direct predecessor to the far more successful *Guitar Hero*—included a range of features that would help make *Guitar Hero* so successful. Among other things, it featured rhythm units as visual cues approaching the player, to be reacted to. But *Amplitude*'s game space stayed highly abstract and the play space remained less activated due to the controller used. While *Amplitude* used the default Sony PlayStation controller, *Guitar Hero* invades the play space with a physical model guitar as interface. The PlayStation 2 version of *Space Channel 5: Part 2* (Mizuguchi 2003) uses the same physical controller as *Amplitude* but the directions here are less abstract and are localized in a fictional space, namely an alien-infested space station. Instead of abstracted symbols arranged along a single axis, they consist of the four directions up, down, left, and right, and a “chu” command that occasionally indicates a “forward.”

When playing the game I find myself in control of Ulala, the disco-queen-like space reporter. Ulala faces hordes of space aliens that need to be defeated in dance battles to proceed in the game. Dance battles start with the aliens presenting a form of dance instructions. Once the instructions are given, I have to control Ulala to follow them in the beat of the song. The situation is not unlike an aerobics session or dance lesson in virtual space: I try to repeat the rhythm and dance pattern correctly and Ulala dances a response to the alien invaders. Once a dance battle is won, Ulala proceeds to the next event. Aliens and heroine share a continuous dancing space. This spatial grounding ties the player more to the in-game world than the single-axis interaction in other rhythm games. Movements are localized dance steps of the virtual character. Still, I remain a slave to the rhythm.

In the case of *Myst III: Exile*, Wall addressed the problem of user-dependent tempo and cue moments by composing one type of music for predefined scenes with no interactive access and another for the interactive moments of the in-game events (Wall 2002). This is an approach taken by many game music composers but it separates the cutscene sections from the interactive ones. In *Myst III: Exile*, in-game music playing during user-interaction is generated by a special audio engine developed by Roland Gustafsson. Generative systems like this one, Microsoft's DirectMusic, LucasArt's older iMuse system, or SSEYO's KOAN X offer a dynamic change of a playing musical piece in relation to the user's interaction. With the help of these “adaptive audio” systems composers can prearrange rules that define the “scoring” of the final musical score in relation to the events (Whitmore 2003, 1).

A change of the background music in *Star Wars: TIE Fighter*, which uses the iMuse system, becomes a signal for growing danger immediately before the enemies will start another attack. This references the use of tension music in many films, including the *Star Wars* franchise, but it not only calls for heightened attention it also allows the player to prepare for the battle. The possible downside is that the music turns into an interface signal and loses some of its impact as a unique musical performance, not unlike the repetitive use of dramatic camera angles in games outlined before. Due to the distinct motif of the musical piece, the clip loses its value as a piece of a powerful but almost hidden tool (as outlined by Chatman for film music), and it becomes more of a foreground sound effect. Like the motion detector of *Enemy Zero* or the radio of *Silent Hill*, the tension music of *Star Wars: TIE Fighter* is a kind of enemy detector. Two things differ, though: using music for such a task means that certain musical motifs remain legible (in contrast, for example, to the white noise of the radio in *Silent Hill*) and in this instance the music is nondiegetic. While the player-character has to be equipped with the necessary virtual tools for acoustic enemy detection in *Enemy Zero* and *Silent Hill*, the music of *Star Wars: TIE Fighter* has no in-game representation. This, once more, quotes cinematic traditions but does not necessarily support the spatial qualities of the game. Orientation or position will not change the music, for example. The music is in danger of turning into a repetitive audio feedback, comparable to the beeps of an operating system that confirm a certain selection or operation. Although the acoustic signal can be a musical score quoted from cinematic sources, it is significantly different from film music.

An example of a hybrid of diegetic and nondiegetic use of music is *Clocktower 3* (Sadamoto 2002). The game is a survival horror title and includes a level staged in 1942 London that is thematically centered on the death of a young pianist. Not only is the sound of the piano playing used in the cutscene-like transition phase into this specific level, but players also hear it during navigation through the world and might assume that this is the specific level's musical theme. But it turns out to be more than that. In order to proceed in the level, players have to enter the theater and see the pianist playing. The main mystery of this level, aptly titled *A Little Night Music*, revolves around the death of just this young pianist. At that moment, the sound that overlaid most parts of the level exploration is reframed as diegetic. The result is a meaningful and dense soundscape that invites the player's imagination—it asks quite literally who the pianist might be and what her fate is. Whenever the playing stops, the player is to act accordingly. The music actively shapes players' fictional planes of the game world.

Other games, such as *Grand Theft Auto III* use a more traditional approach. *Grand Theft Auto III* gives players access to a range of predefined musical scores within the same game space. In the case of *Grand Theft Auto III*, these scores are made available through the interface abstraction of a virtual car radio from which players can choose their personal favorite station. Unlike the *Star Wars: TIE Fighter* soundtrack, the music becomes a diegetic part of the game world. Each station represents a certain mood and lifestyle: there are cynical chat shows and urban hip hop, country, and classic rock channels among others. The predefined style of each virtual radio station allows for a subtle characterization of the objects and locations within the world. The initial radio channel projects certain cultural connotations, some of which might be reduced to archetypical clichés, but they still add dimension to the game space. Whether it is a talk show, a classic music channel, or an R&B station, the player gets a glimpse into the background of the car just hijacked and its former driver. That the player is capable of switching stations is another element of the carjacking and possibly the final sign of their new ownership. However, if we accept music as an important element for the mood of an event, and mood as an influential element that shapes our perception, then the multiple stations of *Grand Theft Auto III* can also be reinterpreted as filters through which the player's mood and thus her perception of the game space are shaped. The radio stations are valuable forms of music implementation in games precisely because they are not adaptive but preset repetitive loops. In a next step, sequels to the game (and game modifications) allowed players to create own channels. Allowing the player to include a custom-made channel, then, is nothing else but the provision for an individual's own "filter" in the simplified form of a music collection. The player has entered the game world on the level of musical construction and includes his or her own cultural background into the game world. This leads to a new role for the player in the actual creation of music.

The user triggers music generation in titles such as *Rez* (Yamada 2001) or the *Quake III* modification *q3apd* (Oliver and Pickles 2003). Here, the user's interactions and/or the non-player characters' behavior call and arrange sound effects that form the evolving musical soundtrack. They add an interactive layer to the formation of the musical score. Notably, these titles have highly abstracted visuals to concentrate on the soundscape.

Through this interactive layer, the system-controlled loops already mentioned in reference to the *Alien Trilogy* have become available to the interactor and can be rearranged in new ways. As the player's input ultimately assembles the soundtrack, its timing and rhythm is highly sensitive to the user's actions. Music, in these examples, is an essential part of the gameplay and cannot be

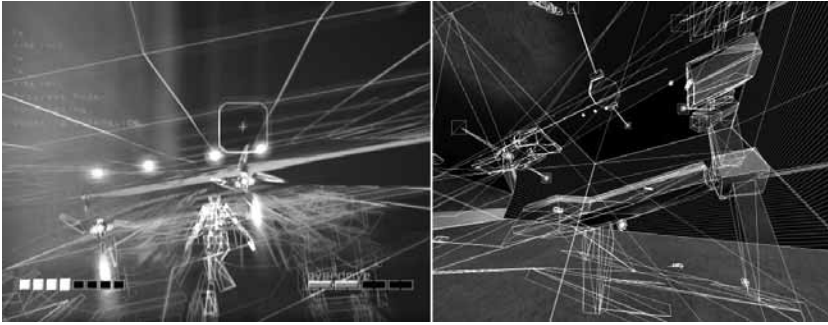


Figure 8.1 *Rez* (left) and *q3apd* (right): examples of highly abstracted game spaces with a focus on visual effects and audio

confined to a layer of presentation somehow distant from the main interaction. Rather, it can connect event to event and events to meaning, and encourage users to understand this meaning within the virtual space, just as film music “bonds: shot to shot, narrative event to meaning, spectator to narrative” (Gorbman 1987, 55). Music and the player’s interaction with it become essential for the creation and development of the game space. This is a parallel to the empowerment of the player in regard to the virtual camera, as discussed in chapter 7. If players in that scenario turned into camera operators, here they become composers and DJs.

In fact, Oliver’s *Fijuu* project (Oliver and Pickles 2004) and *Fijuu 2* (Oliver and Pickles 2006) is exactly this: a DJ mixing table in the form of a 3D space, where loops are spatial tracks and sounds correspond to distractions of virtual objects—all controlled by a PlayStation gamepad. Music and space manipulation have merged into new forms of virtual instruments that are distorted and twisted to form new sounds.

8.3 Speech

Harrison and Dourish argue that “the audio space is truly shared; we each speak and hear in the *same* audio space. The sound of my voice carries over the audio connection and invades your space” (1996, 73; italics in original). Their statement already emphasizes the value of speech in a shared sound environment. Our conversations are localized events that undergo changes in the voice in direct connection to their spatial staging. Instead of projecting the sound generation into the play space—as seen in *Guitar Hero*—the sounds are generated de facto in the play space and projected into the virtual environment.

Speech fills video game spaces as prerecorded, computer-generated, or transmitted live from other players. Prerecorded speech is the dominant form in practical game implementations as well as in advanced experimental games such as the immersive interactive drama piece *Façade* by Mateas and Stern (2005). *Façade* stages the domestic quarrels of a couple around an interactor staged as an old friend visiting at the wrong time. The interactor can move around in the couple's apartment and communicate with them via text input, to which the virtual characters reply via audio output. All the audio available to the characters is prerecorded (Mateas 2002). The prerecorded speech becomes a major part of the character's expressive behavior together with animations, facial expressions, and movements in space. It also becomes a major part of the production process. Creating sound recordings to cover each possible situation is a Herculean task and quickly can prove to be unfeasible under commercial conditions.

That is one reason why speech and sound effects blur in *Warcraft: Orcs and Humans* or speech is reduced to gibberish in *The Sims* series. *Warcraft* uses grunting vocal acknowledgements from its virtual characters whenever the user activates them with a mouse click. Speech transforms into a sound effect in a highly abstracted way, as an interface element to acknowledge the user interaction. Limited and abstracted as this approach might be in contrast to a performing intelligible virtual actor (as in *Façade*), it still adds character to the virtual figure as well as a certain feel to the overall title. For example, a virtual human will respond differently from a virtual orc or ogre in *Warcraft* and the range of different sounds adds an overall level of humor to the original *Warcraft* that was dearly missed in later installments. An even higher level of abstraction can be found in the voices of the sim characters in *The Sims* (Wright et al. 2000). All voices of the sim characters morph into sound effects that still carry emotional tension without conveying any meaningful dialog. Such a conversion allows the game to represent emotional states in the performance of the speech and to disregard the details of what specifically is being spoken. *The Sims* can entirely concentrate on style not on content of the voice. A reduction of speech to effect, thus, can enhance expressiveness.

In contrast to the repetitive battle music in *Star Wars: TIE Fighter*, each entity in the first *Warcraft* installations offers a range of acoustic responses that are fast and stylish. Because players constantly select different entities, each with a range of different replies, the result is a familiar soundscape, but a constantly changing realization of it. Instead of becoming repetitive and annoying, players can find themselves experimenting with this feature alone and testing the range and quality of the responses.

Meanwhile, speech generation still has limited expressive quality. The massively multiplayer online chat world *Cybertown* (n.n. 1995–) uses a non-spatial text-to-speech voice generation in a 2D/3D chat world. Although the visitor to *Cybertown* can choose from a set of voices, the lack of emotion and the impersonal results of the speech generation are apparent and confusing given the often very personal and intimate conversations in these chat worlds. In addition, the voices end up on a flattened soundscape that does not support the game space and stays unconnected to it. Other sounds in the virtual world of *Cybertown* can be spatialized, and the confusion between the two forms leads to mixed signals from the acoustic level instead of collaboration toward a unified sound experience. At the same time, the visual presentation of the *Cybertown* world can be either 2D or 3D, with an extra chat window operating in both interfaces.

Voice over Internet Protocol is less restricted. Players can transmit vocal messages to each other using technology like GameSpy's Roger Wilco or Microsoft's Xbox Live network. It is up to the user what is said, when, to whom, and how. Consequently, voice transmission has more in common with a live telephone conference than with directed cinematic mediation. It allows a highly interactive and unpredictable variety of possible genuinely interactive expressions that cannot be adjusted by the designer to fit into a dramatic order. Not everyone welcomed such an invasion of the "real" into the virtual world. In 2003 Richard Bartle ranted against the implementation of Voice over IP in role-playing games. He argued it would be too early to implement them in massively multiplayer online role-playing games precisely because it would project the "real" into the "virtual": "Adding reality to a virtual world robs it of what makes it compelling—it takes away that which is different between virtual worlds and the real world: the fact that they are *not* the real world. Voice is reality" (Bartle 2003). While it might be a difficult design decision how to incorporate the voice (e.g., Wadley, Gibbs, and Benda 2005), canceling the option entirely seems too extreme and a general tendency is heading more in the opposite direction. Designers of the massively multiplayer online world *Second Life* added a spatialized speech feature that mimics proximity in the sound transmission. It is not only a visual but also an acoustic character representation. The soundscape connects the play space of the individual player to the mediated space of the game representation. This supports the social networking and communication in *Second Life* and opens up new forms of interaction, such as a less rigid form of virtual theater, for example.

In comparison, another feature unique to the speech layer is rarely used in games: Chion's "acousmètre." The acousmètre is defined as a voice that is

“neither inside nor outside the image” (Chion 1994, 129) and that has “the power of *seeing all*; second, the power of *omniscience*; and third, the *omnipotence* to act on the situation . . . [and] in many cases there is also the gift of *ubiquity*—the acousmètre seems to be able to be anywhere he or she wishes” (ibid., 129–130; italics in original). Films often apply this feature, for example in the voice of the computer HAL in *2001: A Space Odyssey* (Kubrick 1968). Its use for video games is promising and only partially exploited. Titles such as *Max Payne* or *Prince of Persia: The Sands of Time* have the inner voice of the main character narrate the situation back to the player. But this is far from realizing the full power of the acousmètre—serving as the voice of the game system itself would better fulfill its potential. A simple example is the “game’s voice” in *Unreal Tournament 2004* that proclaims outstanding game performances to every player in the session. In that case, speech reaches into the last of the five planes: the rule-based plane. But the expressive range and especially depth is rather limited from the grunted announcement of a “double kill” to the ecstatic “ultra kill.” The use of speech has many parallels to that of music: it interconnects different spatial planes and is a powerful force for spatial reinforcement as well as expression within the game space. In the form of Voice over IP it provides a very simple and effective input option that draws the play space further into the virtual world. Thus, it is a genuine force to interconnect the various planes that define the video game space.

8.4 Soundscapes

Ultimately, sound effects, music, and speech have to be combined into one consistent, overall soundscape that has qualities of its own such as balance and timing between the different elements and their relation to the moving image. One key element in this balance is the use of on- or off-screen sound.

Synchronizing off-screen sound with the image “is as basic to the syntax of sound film as the eye-line match or the shot/reverse-shot sequence” (Buhler 2001, 46). It is also a crucial element of the continuity of video game spaces, where the visible world extends into the audible, and where audio cues give indications of the virtual space ahead. The resulting navigable soundscapes are a crucial element of the acoustic composition as they form a kind of *mise-en-bande*—a term established by Altman for film (ibid., 55) but easily transferable to video games. While a cinematic *mise-en-bande* is a linear guidance for the audience, the soundscapes of games are flexible. A player’s spatial exploration is also a journey through a varying soundscape. Mixing any element of the *mise-en-bande* for a video game has to take this level of user interaction into consideration. It is dynamic and has to be aware that any off-screen sound

source might be any moment in the audible field, depending on the player's interaction. The play between visible and invisible, audible and silent, visible and silent, and invisible and audible is part of the game world experience and offers countless possibilities for evocative narrative elements.

Elaborate soundscapes can build up a dramatic foreshadowing, provide direct acoustic engagement up to the climax, and mark an end with a cathartic aftermath. The sound design of *DOOM 3* applies this in all its mastery. Christian Antkow is credited with the sound design for *DOOM 3* but Trent Reznor was involved once more, this time in the sound design of the game's earlier released demo.

In *DOOM 3* I steer a lonely space marine in a first-person point of view through a scary and hostile 3D world. Along the way I often trigger certain events, usually through sheer proximity to an invisible trigger zone. These are not only visual events that call for interaction—usually monsters jumping from the shadows that need dealing with—but also sounds. These sounds can include nondiegetic music, in-game sound effects, or diegetic speech from other characters seemingly active in the same haunted space station—often in their moments of death. Without directly changing my own actions or range of interactions, these sounds draw me deeper into the frightening game space. They are like a trail of breadcrumbs luring me into the setting and into the game world. The very elaborate soundscape is forced upon me, for I cannot avoid or cut short the transmission of death screams and futile rescue attempts of my fellow space marines. The voice recording is exceptional for video game standards and the grueling effects truly make me scared of the road ahead. I am primed to expect the worst, as the foreshadowing of deadly events is evident in their acoustic presence. But as much as I would like to avoid this stressful situation, I have to pay attention to every possible sound source to survive. Lighting is often reduced to levels that make enemies recognizable only through their grunts, so I find myself navigating the twisted darkness relying to a great extent on sound cues.

Like many other titles, *DOOM 3* uses highly energizing musical pieces to dramatize key enemy encounters, but they are only part of a larger soundscape evolving from all the different sources. Once the frantic fight breaks loose, explosions, cries, weapons fire, footsteps, and music blend into an overwhelming soundscape. The panic and visual as well as acoustic overload of a well-timed attack then breaks away and the end of the fight lets me fall back into the silence of the mainly deserted game world. This change in the *mise-en-bande* provides an almost tangible relief before the eeriness of the silence starts to creep back in and tension builds once more.

As with interactive montage and performing cameras, we see that space and its exploration implies an empowerment of the player over traditional concepts—in this case of sound arrangement. A single prefabricated mix of a soundscape is close to useless in a 3D video game that demands a flexible and spatially rooted sound design of all the interconnected elements. The dynamic positioning of the listener is not an option but a fundamental design decision, just like the camera's perspective. Both are examples of a narrative positioning in 3D video game worlds; both tell space and situate within it.

Although the positions of the camera and the listener have been outlined as important elements for this telling, they do not necessarily have to be the same. Like many car racing games, *Colin Mcrae Rally 3* (Osborn and Lowes 2002) offers different viewpoints during the main gameplay: in a first-person perspective inside the car or “on the hood,” or in a following third-person perspective behind the car, but the listener's position remains the same. The player's visual position thus differs from his acoustic position. Rowland argues from his practical experience “that the listener should be situated to enhance the feeling of immersion rather than to reinforce the viewpoint of the camera” (2005, 7). The player's positioning in relation to the game event is thus divided into acoustic and visual. There is a distance between the two that, in this case, is used to maintain continuous immersion. The point is not whether Rowland is right—other racing games apply sound in different ways—but that his argument points to higher complexity on the level of the mediated plane. The separation into visual and acoustic perspectives can be applied to actively shape the fictional plane in other games, such as survival horror or sports. While the generation of a soundscape concentrated mainly on synchronization between sound and image to support the creation of the video game space, the distance between visual and auditory level within an interactive setting allows sound to become a counterpoint to the moving image.

Film sound has seen the call for a more independent use of the sound level, a “counterpoint” (Buhler 2001, 45, referring to Brecht and Eisler's use of music). Even Chion sees no “natural and preexisting harmony between image and sound” (1994; see Murch on xvii). Both meet to achieve certain effects in film but are free to separate whenever they want to. The use of music in *Clocktower 3* stands out as one use of this division in video games, and many other games from *Halo 2* to *Second Life* recognize the value of a complex soundscape for the telling of their spaces. However, it remains an area ripe for more exploration. For the creation of a soundscape this division can be diversified: sounds, music and speech can all generate different acoustic

perspectives that can be dynamically rearranged in their relation to the event and its visual presentation. The video game space can involve the player on multiple perspective layers at the same time. The mediated plane gains new facets that can be assembled into a more complex network, playing with diverse positioning of the interactor in relation to the game world. The acoustic telling of space in modern video games has become highly elaborate, not to simulate realistic worlds but to evoke dramatic game locations.

Effects of Narrative Filters

Both visualization and soundscapes point to the generation of a complex narrative perspective toward a narrated event created by the presentation. The narrative perspective emerges from the available interactive options, but also from the way the space is told to the player. The mediated plane works like a narrative filter between the rule-based plane and the play space. This narrative perspective is not derived from a general claim that all games tell stories but that all 3D games tell space and players comprehend the space and the way it is populated with evocative elements as a contextualized fictional space. It is a consequence of the games' spatiality. All 3D video games that offer interactive and navigable game worlds contain this narrative element.

The following section will argue that the narrative perspective opens up layers of guidance through focalization in games. For 3D games, these are not optional add-ons but ever-present effects in 3D game spaces.

Genette (1980) introduced many helpful tools that have been applied by games researchers. One of them is the distinction into "who tells" and "who sees." Mieke Bal developed the concept of focalization from this division and expanded it beyond written texts into other formats, including bas-reliefs, movies, and pictures. Because Bal includes visual storytelling, her approach applies more directly to 3D video games and is used here. Bal defines focalization as "the relationship between the 'vision,' the agent that sees, and that which is seen" (1997, 146). "That which is seen" constitutes the action and the objects involved in it; "the agent that sees" is the *focalizer*. These focalizers take different forms and shapes. "The subject of focalization, the focalizer, is the point from which the elements are viewed. That point can lie with a character (i.e., it can be an element of the fabula), or outside it" (ibid.).

Consequently, Bal distinguishes between the character-bound focalizer and the external focalizer; others refer to the same division as internal and external focalization (Omega and Landa 1996). The complexity of today's game presentation, as it has been outlined, allows for both forms and combinations of them, which open up a wide range of options in the arrangement of the evocative narrative elements.

9.1 Focalization in Games

In the beginning and throughout *Prince of Persia: The Sands of Time* (Mechner 2003), the character of the Prince is established firmly as the narrator as well as the main hero of the events. He “tells” the predefined linear storyline as a flashback. This limits the possibility space to such an extent that his narration can oppose and reject in-game actions realized by the player if they do not comply with his “memories.” For example, whenever the player fails and yet another virtual death stops the Prince in his progress, the Prince's voice might inform us, “That didn't happen.” The narrator contradicts the just-actualized event. In order to succeed in the game, the player has to perform the memories of the Prince. The game leaves it open how to perform them but binds the player to the linear string of events as dictated by the Prince's memories. Leaving this memory trail or failing the puzzles and fights along the way are not viable options (see also Rhody 2005).

While the acoustic telling grows from an internal perspective, the camera, the focalizer that “sees” these events is external. The game features a first-person point of view option but in this view no interaction is allowed except looking around. The dominating view is a player-controlled version of the following camera. As described above, the game can also fix cameras in space to enforce a certain perspective and offers fixed, predefined viewing planes. Like a visual help function, these cameras direct and focus attention on the pathway through the current game space. They tell the space and the path through it, they position the hero's and ultimately the player's quest. This camera work is predominantly that of an external focalizer.

Like *Prince of Persia: The Sands of Time*, the game *Max Payne* works from the premise of a memory flashback. Starting at the end of the game's fictional time frame, the player jumps back in time to retrace the hero's path toward the final battle. The game occasionally features the narrating voice of the hero that delivers a kind of inner monologue, and the disillusioned perspective of Max Payne adds a distinct noir style to the game. This “telling” voice is so strong that on one occasion, Max can reflect upon a nightmarish vision of him being part of a video game controlled by somebody else. The narrator displays

awareness of his own role in the textual process, addressing the player directly through the reference. He directly addresses the differences between the rule-based and the fictional plane via the mediated plane. In that way he reinforces connections between them and toward the player.

At the same time, the dominating camera is a mixture of following camera and over-the-shoulder shot—an external focalizer. The camera consciously plays with tropes from Hong Kong film genres in features such as the bullet time or bullet ride. Players receive mixed signals. They control the character of Max Payne and hear his internal monologue but at the same time they look at him from the outside. This might be a standard technique, for example, in film, but what is new here is that players control both layers. They direct the hero through his adventures as well as adjust the eye of the camera. Both actions are interconnected but separate. This gap between focalizer and object of interest allows for complex presentation. *Max Payne's* most versatile examples of focalization feature in the dream/drug sequences.

In these scenes I control Max as he revisits a spatially distorted vision of his own former apartment. I recognize the location because it cites the memorable first level of the game again. This level remained important because it introduced me to the hero's main motivation, the source of his internal wound. While I explored the apartment in the game's opening, a group of drugged thugs killed Max's family in the other rooms. No matter how fast I tried to catch up with them, I couldn't prevent this slaughter and I can't help but feel partially guilty. Did I do something wrong? Was there any way this disaster could have been avoided? The sequence offers a strong incentive to emotionally connect to the main character through the shock of the crime. It remains a central location for the virtual hero's personal story. When Max and I revisit this location as a distorted surreal copy in the dream/drug sequences, the context, shape, and relevance of the location clearly grow from the character, his past, his attitude, and his voice. The location also points back to my own relationship to Max and the game world. Technically, the visualization stays external in the form of an interactive following camera. At the same time, the focalizing camera tries to present Max's internal perception of the surrounding game world, distorted as if seen while on drugs. It includes color filters, paths of blood, distorted architecture, and foggy abysses that have no counterpart in the realistic style of the rest of the game. The camera still looks *at* the hero but the images are seemingly filtered *through* his eyes. Notably, this form of presentation was continued and elaborated on in the sequel *Max Payne 2: The Fall of Max Payne* (Järvillehto 2003), in which dream sequences are repeatedly used, for example to introduce new chapters in the game.

The same effect is applied and enhanced in *American McGee's Alice* (McGee 2000), where the whole game is set inside the heroine's mind. Like Payne, Alice had a traumatic experience that changed her life and shaped the state of the game world. In the opening cutscene Alice fails to alert her family that their house is on fire and her parents die in the flames. The event implants a guilt complex into Alice, which ultimately extends into the whole game world. Mirroring Lewis Carroll's creation of an imaginary Wonderland within Alice's creative mind, McGee throws the player into a horror version of such a world distorted by guilt.

The final battle in *Alice* has to be read as one against her own guilt and evolves over multiple stages. First, it is a battle against the Queen of Hearts, the monster staged as the ruler of the game universe who seemingly perverted Alice's once-peaceful Wonderland. But her role changes as Alice destroys different versions of the shape-shifting enemy, only to discover and ultimately defeat "herself" at the heart of the final version. After the destruction of herself, Alice's internal fantasy world—the virtual game universe—disintegrates and a ring of stones floating in empty space is all that is left of Alice's "deconstructed self" and her internal world. This is the arena for the final fight, set in a dark world without end in sight. Here, Alice battles an almost shapeless monster: a manifestation of her guilt complex as it rises in the center of the



Figure 9.1 *American McGee's Alice*: Alice finds herself at the heart of evil; the caption reads: "If you destroy me, you destroy yourself!"

stone ring. Finally, at the end of her adventures, Alice faces her true problem. The game literally forces her to “face” her destructive feeling of guilt, as the player can only fight the final monster by looking at it, constantly maneuvering on the last pieces of the navigable world that was Alice’s Wonderland.

Technically, *American McGee’s Alice* uses the *Quake* engine and much of its gameplay resembles the fast-paced action of this seminal first-person shooter (American McGee was a renowned level designer on *DOOM 2*, *Quake*, and *Quake II*). Interestingly enough, McGee chose to replace *Quake*’s first-person point of view with an external following camera throughout, with occasional cutscenes and a first-person point of view that allows for orientation but excludes further interaction. The camera is looking at Alice, but the game setting pulls the player inside the main character’s mind. Tim Schafer’s *Psychonauts* (Schafer 2005) also implements this concept of the hero entering an internal psychic world, yet in *Psychonauts* the player controls a character distinct from the worlds he enters: an explorer of others’ psychic worlds that can, at times, distort the perception of the hero to emphasize this perspective.

Like *Max Payne*, *God of War* (Jaffe 2005) situates its game setting in the flashback of the main hero. In the opening cutscene the hero starts at the “end of the line,” which happens to be at the edge of an enormous rise. In *God of War* this end of the line is located at the cliffs of Mount Olympus, in the contemporary *Max Payne* it is atop the skyscraper of the main enemy corporation—in both cases the only option left is to step forward into the abyss. The difference is that in *God of War*, Kratos, a fierce warrior, actually seems to commit suicide by jumping off that cliff. The moment the hero seems to hit the ground, the game transports the player back three weeks in the fictional game time. The player controls Kratos’s actions toward that end, which turns out to be just one more twist in the storyline. Like a lifetime of memories flashing by in the last moments before death, the biggest part of the game unfolds in this gameplay, which includes various perspective changes as well as internal flashbacks inside these memories. It also includes the hero’s family tragedy that shapes his motivation. In *God of War*, Kratos himself kills his wife and daughter, blames the gods somehow for this disaster, and rushes to revenge this injustice. Unlike *Max Payne*, *God of War* reveals this initial motivation to the player only bit by bit, in prerendered cutscenes that are unlocked at specific moments and commented on by an external narrator—clearly not in Kratos’s voice but that of a woman. Even more so than in *Prince of Persia: Sands of Time*, the camera is an external focalizer. Viewpoints are defined in space and react to the player’s movement through the levels, but the interactor has no access to the camera controls whatsoever. Players look

at Kratos but never through his eyes, and never gain camera control except when sharpshooting.

The hero initially remains more detached. While the immediate shock of *Max Payne's* or *Alice's* opening sequence draws the player into the hero's world, character revelations in *God of War* are fragmented. In *God of War* the player controls the main character but almost follows him through the linear game space. Over time one can build up a relation to this character, and although the initial killing of the family is not interactive the game features a scene comparable to the beginning of *Max Payne* later on in the quest. In one of the later levels, the player seems to get the opportunity to save his virtual family from copies of himself. But there is no chance to change the past; the family will die, as was the case in *Max Payne*. Again, this final fight is staged in the setting of the initial slaughter, a temple-like structure. While the fight continues, the original structure disintegrates and breaks into pieces until only small rocks remain, floating in some heavenly space. Like *American McGee's Alice* the core of the character is reduced to rubble, to a ruin that lacks any "way out." The player clearly plays the hero's "inner space" and finally reaches a close connection to him as the fictional plane literally copies Kratos's main dilemma.

Ultimately, *God of War* keeps the player at a certain distance from the character through the continuous external focalization. Unlike in *Max Payne* or *American McGee's Alice*, the hero cannot reflect upon his state as a game character. He remains a pawn and lacks the necessary independence to realize such a state. It is telling that at the very end the initial suicide is prevented and Kratos instead is elevated to Olympus to become a new god—beyond such mortal problems such as guilt.

Distinguishing between focalization and narrating voice in open structures, such as simulation or strategy games, can be more difficult as their "voices" are often less present or articulate. But a weakened voice/narrator does not necessarily imply a weaker focalizer. Because the camera has been detached from the in-game event, it can remain a strong narrating filter to the action depicted even if the events seem chaotic and overwhelming. In fact, many open-structure games offer strong and directed visual focalization.

Age of Mythology (Fischer 2002) loosely connects its battles along a storyline. One part of these campaigns includes battles fought in a dream world of the general-hero. In addition, there are interconnecting cutscenes to contextualize the next fight but no distinct narrative voice "tells" or comments on the battles. The freedom of the player to command the troops on the virtual battlefield is key to the battle simulation elements of the game. At the same time, the player controls the camera that presents the game space exclusively

from an external view. A crucial feature of the game is the instant repositioning of this camera. Players can teleport the camera to look at any location of the virtual playground, meaning they can focus in an instant on a new battle or check their bases. The feature is essential, because access and fast response to events spread throughout the game world is crucial. It is also a good example for detached camera and variable focalization based on interaction. To win a complex battle in *Age of Mythology*, I have to constantly shift focus from one location to another. Focalization is driven by me, the player, and is vital for the “open” gameplay, while the narrative voice can be watered down.

9.2 Control and Guidance

Focalization in video games cannot simply copy cinematic traditions. If it does, the result is a return to a linear format—the cutscene. In contrast, an interactive detached camera like Lakitu in *Super Mario 64* or the variable god perspective of *Age of Mythology* empowers the player to direct the view at any detail—significant or not. How can this freedom still maintain a focus on selected objects within the game world, as demanded by Bal?

Video games occasionally operate against the freedom offered by their interactive cameras to “structure” the view. For example *Prince of Persia: The Sands of Time* can automatically enforce certain camera positions when the system considers such adjustments necessary; *God of War* adjusts the camera only to the position of the avatar and even excludes any player influence except for sharpshooting segments. Such camera behavior is a clear example of focalization that offers powerful guidance via the visualization, but has to face some criticism. The limitations of the camera in *God of War* turn its virtual space into a film set with a clearly defined fourth wall. Levels do not have to be complete any more as players concentrate on the section that is visible in the camera. Because players cannot control the view and cannot turn around the viewpoint, no geometry will be found beyond the framing of the picture. The camera simply refuses to show this section. Players can find themselves running against the fourth wall of the camera lens that defines one borderline of the existing world. While this might enhance the cinematic control of the designer, it limits the player’s visual access to the game world. The focalizing forces can become quite literally an obstacle.

A less rigid direction of view tries to encourage instead of enforce the focus on points of significance. Drawing from Gibson’s “affordances” (1986), Fencott outlined the concept of “perceptual opportunities” (1999), which aim to structure the player’s perception of a virtual space via stimulating rather than

enforcing through the use of “attractors.” “Attractors are POs [= Perceptual Opportunities] that seek to draw the attention of a user directly to areas of interest or to situations that require action” (Isdale et al. 2002, 11–12).

These attractors can either repel (as “objects of fear”) or attract (as “objects of desire”). The overall model is an ambitious combination of presentational features and events, which complicates a proper validation. However, the notion of attractors supports the claim for evocative narrative elements and points toward an extension of these elements onto cameras and the design of the game world. In the case of presentation, affordances are a powerful tool to guide the player. The view might be interactive, but the game can call for certain perspectives through the situation of the gameplay. It can shape the *mise-en-scène* through its control over the space and the necessary action within it. This happens all the time in games, but rarely is acknowledged as meaningful focalization.

As mentioned for *American McGee's Alice*, the final fight exemplifies this focalization. In order to destroy the final monster, Alice has to look at it. Alice has to face and overcome her guilt. The player has to align the view axis via Alice onto the monster. When *God of War's* Kratos defends his family he has to “hug” his wife to increase her “life” variable. This is accompanied by a closing-in camera, which moves back once the fighting starts again. Kratos has to visually reunite with his wife and daughter and the camera work takes the player with him. *Max Payne* has to look at the bloody path in order to follow it through the dream levels. The hero has to deal with his past and the player shares the situation, immersed in the same distorted “inner” game world. The impact of this guidance of the view is so strong that Davis has even argued that *Max Payne* uses noir style in its camera work although it remains interactive throughout (2002).

Focalization in all three examples is also achieved via directed spatial design that concentrates on the bare necessities of the visual cue: the final stage in *American McGee's Alice* is a ring of rubble; the stage of Kratos's family-saving attempt in *God of War* is a hall gradually breaking into pieces and turning into an island floating in space; the apartment of *Max Payne* is reduced to a ghostly nightmare version of the original.

The effect of visual attractors, thus, is often accompanied by a reduction of the architectural space. *DOOM 3* can serve as one example that applies comparable concepts without any limitation of the camera control. *DOOM 3's* camera during interactive gameplay employs strictly a first-person point of view. Through the eyes of the main protagonist the player encounters a world that is dark and gloomy. The game's 3D engine was hailed as another evolu-

tionary development to attain higher levels of realism and dynamic lighting, but instead of presenting as many objects as possible all the time and showing off the new polygon masses, *DOOM 3* leaves much of its world in darkness. Only fragments of the game space are illuminated, but enemies can lurk literally behind every object. The game space overwhelms the player with ever-changing, highly detailed objects to focus on. Danger is omnipresent but the available visual pointers are fragmenting. Enemies can attack from anywhere at anytime, much like in a survival horror game. Finding the right visual and audio prompt is essential.

Playing *DOOM 3*, I find my health at a dangerously low level, and I'm running out of ammunition as I steer my space marine into a twisted corridor with hidden corners, where flickering lights cast dancing shadows on strange machines and sparks cut through volumetric fog that fades into the darkness of other sections. I know only too well that some monster is out there somewhere, but the mix of darkness and dynamic lighting makes it difficult to focus on any one object. My attention is drawn toward multiple points at the same time. The sudden appearance of the monster—and if there is one imperative in games such as *DOOM 3*, then it is the continuous promise to deliver that next monster—demands complete attention. In a shock moment I have to bundle all my scattered attention and deal with the approaching enemy. Focus shifts from all other objects to concentrate on the attacking beast.

Film audiences might miss the introduction of the monster (or close their eyes in fear) but still enjoy the rest of the show without any disruption. Missing the arrival of an enemy in *DOOM 3* usually leads to an untimely death, signifies failure, and brings with it the punishment of having to reload and play the sequence again. To “survive” in the world of *DOOM 3*, a player has to remain glued to the game world, constantly filling in the blanks left by the pieces of visual cues, expecting the worst. You cannot look away when the monster finally attacks but have to focus as fast as possible on the new challenge. *DOOM 3* illustrates that in video games focalization is not only a “pushing” technique as it is in film, but also a “pulling” one. It can pull precisely because the camera is interactive and players can search the game space for more information. Because the camera is interactive it can support dynamic focalization. The object to focus on becomes a directing force, and the relationship between focalizer and focused object is strengthened, not weakened, because it is dynamic and interactive.

Focalization uses the operation of the presentation elements as narrative filters that provide a form of perspective toward the events as they unfold on

the virtual stage. The focalizer can serve both masters: the directing designer and the interacting player. It operates as a narrative guide through the game universe, an application of the narrative filtering identified in the preceding chapter. It has the power to increase a game's drama without forcing it into a linear cage. Genette's initial distinction of "who tells" and "who sees" grew out of a literary tradition in which the "telling" was a given. Bal untied them further with respect to visual media. Video games rip this distinction further apart through the element of interaction. Yet, while the interaction is supported, the focalizing power of the presentation remains at work and can even grow in importance.

Focalization as developed in the context of interactive camera work helps players to comprehend any given game situation, contextualize the event, create strategies to address it, and ultimately interact with it. In that way, the process of comprehension, planning, and action positions the narrative moment of focalization right at the heart of the game, as a powerful way to engage with the game space. It stretches between all the analytical planes and draws them closer as it becomes an effective and active part of the encounter of the game space.

Presentation is a condition for the creation of video game spaces. These spaces combine elements from architecture and film and depend on the mediated plane to become accessible for the player. Presentation is therefore a precondition for meaningful interaction with them. Games might remediate cinematic techniques and their spaces might apply filmic forms of visualization, but they do so in order to implement and support the interactive access available within this space. Often both are intertwined, as seen in the camera control and editing examples. That is why we cannot discuss presentation of game spaces from a cinematic perspective only. Like movies, games are part of the moving-image tradition in their visualization, but they have their own clearly established traditions that are closely tied to interaction. This development is ongoing and the examples presented are only a select few from the immensely rich field. They nevertheless highlight the importance of taking presentation in video game seriously, base it in the game space and its conditions, and connect it to a game's functionality.

These forms of presentation are not neutral, and the way we encounter game spaces is not neutral. Whether it is the camera work, the editing, or the sound, each adds a form of narrative filter to the game environment. Because presentation is dynamic and often interactive, this filter is neither simple nor static. Furthermore, it is constantly at work, adjusting and guiding the player without directly blocking interactive access. In that way, it provides a form of structure. Focalization is one form of this guidance.

If one is pressed, then the question of whether presentation is as valuable as functionality is a chicken-and-egg dilemma. One cannot interact with the game without the necessary layer of presentation, and without the interaction the presentation might as well be that of an established media format. But when both presentation and functionality are interconnected, the results are very effective game worlds where the textual process is supported in ingenious ways.

III

Functionality

The *functionality* of video games describes what a player can do in a game and how. It is a product of the rule-based proceduralism of digital media, which allows for the dynamic use and change of game data. A lot of systems apply procedural techniques, including artificial intelligence, interactive fiction systems, and simulations. Here, the focus will remain on space; thus a game world is approached as a spatially defined condition for interaction.

Architectural Approaches

This chapter builds the bridge from polygon game worlds to architectural theory. It combines architectural concepts in a basic framework, which is then used to look at a number of sample structures. Architecture helps describe how a game world can gain significance and a quality or “place,” which is at the core of the last chapters of this book. Depending on their interaction with the world, players change their positioning toward these environments and take on a role. This role, its limitations, and its possibilities are discussed before part III introduces story maps. Story maps offer a model to understand the player’s overall comprehension of the engagement with the game world.

A designer of 3D video games uses evocative narrative elements in the virtual space and the interactive access to stimulate the player’s participation and comprehension of the game world. One way to arrange this stimulation is the structure of the navigable virtual space. How then does space connect to the work of evocative elements? What processes can be shaped by a spatial design and how might they influence a player’s comprehension of game events? What is the functionality of rule-driven, architectural game spaces?

It is the use of and interaction with the game world, or any other space, from which the character of the space can evolve. As Alexander recognizes: “*A building or a town is given its character, essentially, by those events which keep on happening there most often*” (1979, 66; italics in original). Like digital game worlds, architectural space comes to life through the way it is used, and specific structures can help particular patterns evolve. But this is not a one-way connection. At the same time, patterns of use reflect on architectural arrangements. Learning from architecture, 3D games can assist concentration on

certain patterns of events and make others less likely to occur. They can also realize that the ultimate target has to be meaningful usage of these space, which means that they might be literally taken over by players and remodeled by their activity. How can architectural theory be applied to video games and help to identify and enhance the properties of video game spaces?

Numerous analyses of architectural structures define elements or patterns connected to particular qualities that affect the inhabitants. Elements have been defined ranging from basic geometric shapes (e.g., Ching 1979) through interconnected patterns of use (Alexander 1964, 1979; Alexander, Ishikawa, and Silverstein 1977) to cognitive structures (K. Lynch 1960) and social spaces (Hillier and Hanson 1984). Unifying these categories is beyond the scope of this (and probably any) book. The patterns and elements do not assemble into one singular structure and cannot be forced into a fixed “meaning.” Ching explicitly excludes such an attempt (1979, 386), as do Lynch (1960, 9) and Mitchell (1990, 204). Alexander, however, addresses the task of matching meaning, structure, and use when he proclaims: “There is one timeless way of building” (1979, 7) that encapsulates all fundamentally active patterns. “The quality without a name in us, our liveliness, our thirst for life, depends directly on the patterns in the world, and the extent to which they have this quality themselves. Patterns, which live, release this quality in us. But they release this quality in us, essentially because they have it in themselves” (ibid., 122).

Alexander’s universal combination of meaning and structure focuses architectural complexity in one holistic concept. The all-embracing presence of this “quality without a name” renders it problematic but nonetheless inspirational. Alexander makes this theory more concrete in a collection of spatial patterns (Alexander, Ishikawa, and Silverstein 1977). Chapter 10 does not seek to define a single “language of architecture” but to identify a framework of spatial understanding on different levels, which can be applied to game spaces.

First, it will develop its model from an assembly of various architectural theories and try to interconnect their key features in an admittedly simplified model. Then, it covers some specifics that are outside the scope of traditional architecture but integral to the nature of virtual space. Chapter 11 will apply these theoretical references to some examples drawn from typical game-like spatial structures.

10.1 Preparing the Model

Influenced by Heidegger, architectural theorist Norberg-Schulz (1980, 10) starts his analysis of space by dividing architectural space into two classes:

human-made space (settlements) and natural space (landscapes). Natural places are identified as landscapes with extension and surface relief, whose characters are defined through texture, color, and vegetation. Human-made spaces show human beings' understanding and shaping of the natural space that they build in. "The existential purpose of building (architecture) is therefore to make a site become a place, that is, to uncover the meanings potentially present in the given environment" (ibid., 18). These human-made places relate to natural spaces in three different ways:

- They make the natural space more *precise*—including the visualization of the natural space, the understanding of it, and the resulting building in it; for example, where the natural space indicates a direction, a path can be created.
- They *complement* the natural space—adding what seems to be lacking in the natural space; for example, a canyon might be crossed by a bridge built to allow further access.
- They *symbolize* the human understanding of nature—including the translation of acquired meaning of a space into another medium: "The purpose of symbolization is to free the meaning from the immediate situation, whereby it becomes a 'cultural object', which may form part of a more complex situation, or be moved to another place" (Norberg-Schulz 1980, 17, still based on Heidegger). For example: the Golden Gate Bridge has become a cultural icon beyond its functionality as a connecting bridge reproduced in various forms and media.

All three effects are interconnected in the process of creating a place. Before one can build a bridge or any other structure that uncovers the qualities of the given space, one has to understand that a certain spot is a good place for such a structure. Such an understanding depends on a "reading" of space, a concept that leads into the realms of spatial recognition and cognitive mapping.

Cognitive maps are complex mental interpretations of a real or fictional environment, and its components that live in the fictional plane. Roger M. Downs and David Stea argue that "cognitive mapping is a process composed of a series of psychological transformations by which an individual acquires, stores, recalls, and decodes information about the relative locations and attributes of the phenomena in his everyday spatial environment" (qtd. in Kitchin and Freundschuh 2000, 1). The process for generating such a map differs from observer to observer. Kevin Lynch refers to the "light of his [= the observer's] own purposes" that is responsible for the generation of differing maps from

the same environment (1960, 6). We can already add that for video game spaces the presentation is an essential part in this “light.”

Each observer’s cognitive map is unique. A tourist and a local police officer might read the same city structures—for example, the Golden Gate Park—but their cognitive maps differ completely, reflecting their subjective perspectives, individual experiences within the city, and the conditions of those experiences. However, Lynch analyzes the way observers create such a cognitive map of a city and extracts five shared elements that define evolving cognitive maps for different individuals:

- path—evoked, for example, by images of streets or rail tracks;
- landmark—evoked, for example, by monuments or historic sites;
- edge—evoked, for example, by rivers or seashores;
- node—evoked, for example, by crossings; and
- district—evoked, for example, by suburbs (K. Lynch 1960, 49–83).

These five elements are distinct parts of the mental image of a spatial structure that help observers to generate a cognitive map of the environment. Depending on the observer’s position, a single spatial structure can have different connotative elements attached—for example, a bridge might be a path to use for someone standing on it, a landmark for orientation for someone far from it, or—if too low—an edge for a ship trying to pass under it. Perspective, positioning, and the “light of the purpose” profoundly influence these assignments and the generation of the cognitive map. As these factors change, cognitive maps are constantly updated and rearranged. During the exploration of a physical space “nothing is experienced by itself, but always in relation to its surroundings, the sequences of events leading up to it, the memory of past experiences” (*ibid.*, 1). The resulting cognitive map ties spaces together in a meaningful way, assembles events in a spatial order, and positions the human in relationship to them.

Here, Alexander’s “pattern language” is a good reference point. As unifying as the “quality without a name” might be, Alexander also recognizes that every culture, every subculture, and in fact every member of a culture, can and should have its own collection of “patterns.” But he also argues that shared pattern systems can be identified. His collection of 253 patterns is one of these pattern systems. It consists of spatial hypotheses of which some, he claims, have qualities of archetypes. “In this sense, at least a part of the language we have presented here, is the archetypical core of all possible pattern languages, which can make people feel alive and human” (Alexander, Ishikawa, and Silverstein 1977, xvii). The patterns differ widely in size, from large regions

inhabited by two to ten million people (pattern 1: Independent Regions) to “what kinds of things to pin up on the walls” (pattern 253: Things from Your Life) (ibid., 1165). One of the more archetypal patterns is that of arcades described as ambiguous spaces between the inside and the outside of a building that—through their ambiguity—make the building more “friendly” (ibid., 581). Arcades are described with a perspective to how a visitor might encounter them and in terms of “paths,” “places,” and “edges.” For example, Alexander, Ishikawa, and Silverstein argue that “to establish this place as a territory which is also *apart* from the public world, it must be felt as an extension of the building interior and therefore covered” (ibid., 582). Kevin Lynch’s principles reappear in the details of such a pattern. They materialize in detailed spatial observations.

Ching concentrates on visible architecture and provides detailed definitions of those visual properties at work in architecture that can be applied to evoke the images leading to more complex forms such as Alexander’s patterns or Lynch’s key elements. He defines “visual properties” as consisting of “shape/size/color/texture/position/orientation/visual inertia” (Ching 1979, 51). The resulting combinations of properties are manifold, but Ching establishes limited ordering principles, among them:

- Axis—A line established by two points in space and about which forms and spaces can be arranged.
- Symmetry—The balanced distribution of equivalent forms and spaces about a common line (axis) or point (center).
- Hierarchy—The articulation of the importance or significance of a form or space by its size, shape, or placement, relative to the other forms and spaces of the organization.
- Rhythm/Repetition—The use of recurring patterns, and their resultant rhythms, to organize a series of like forms or spaces.
- Datum—A line, plane, or volume that, by its continuity and regularity, serves to collect, gather, and organize a pattern of forms and spaces.
- Transformation—The principle that an architectural concept of organization can be retained, strengthened, and built upon through a series of discrete manipulations and transformations (ibid., 333).

These ordering principles determine the visual properties, which then can evoke Kevin Lynch’s “mental images.” In terms of design, a bridge, for example, consists of various visual properties arranged in a special way: arcs, beams, surfaces as shapes, pillars of a certain size arranged in a certain repetitive pattern, concrete or metal as colored textures, all occupying a given

position and orientation within the surroundings. These ceilings, pillars, and pathways can add up to make an arcade “friendly.”

Various examples have demonstrated that virtual space is filled with evocative narrative elements that help to transform its arbitrary origins into meaningful worlds. In the design of these game worlds, combining Ching’s theories with those of Lynch and Norberg-Schulz is strikingly helpful. The visual properties of a video game space correspond with the immediately visible geometrical information in a game world and can be analyzed and designed in accordance to Ching’s principles. Indeed, the modeling functions of a 3D creation program like *Maya* copy Ching’s “visual properties.” They can also be encountered in structures that might follow Alexander’s pattern. In combination with interactive events and explorations, these structures can evoke certain readings of a space. These readings use Lynch’s definition of the main structural elements and lead to a mental image of the space for the visitor—a cognitive map. Based on such an understanding of the space, the player forms a new interpretation of the virtual world. Here, Norberg-Schulz’s outline can describe the possible nature of this evolving relationship to virtual space. The combined model presents a connection from the single evocative spatial element and its visual appearance to the overall context that is projected into a space.

Although this brief overview of architectural theories cannot hope to offer an in-depth evaluation of their claims, in summary, it provides a way to describe how evocative spatial features can affect a player’s perception and interaction. But having prepared the architectural vocabulary for game spaces, one immediately faces another challenge: virtual space is not restricted by the same limitations as the physical space on which these architectural theories are based.

10.2 Expanding the Space

Due to their mathematical nature, game spaces can be encountered in ways that Norberg-Schulz did not foresee for physical spaces. Two new features are the *destruction* and *construction* of space, which offer an addition to Norberg-Schulz’s three main activities in relation to space. The notion of destruction has a different meaning in an experiential game world due to the mathematical—instead of natural/physical—foundations of virtual worlds. Digitally created space can be “destroyed” and blown into oblivion without any significant consequences for the physical world. But unlike any other mediated space, only the interactive environments can make this destruction experiential to the player. One example points back to the bridge metaphor: the

first-person shooting game *Medal of Honor: Allied Assault* (Giolito 2002) positions the player in the role of a U.S. soldier in World War II and incorporates references to historical battle sites.

Once more I pick up the controller to win a war seemingly single-handed. The first-person point of view takes me back to selected battlefields. At one point in the game I receive the mission to guard a virtual bridge and prevent enemy access. If I fail to stop the enemy characters, they will destroy the virtual bridge and my mission is a failure. Historically, the setup quotes an important tactical moment of the World War II campaign “Operation Market Garden.” It shaped the progress of the Allies into Germany in the summer of 1944, when they had to cross the rivers between the Netherlands and Germany and needed connecting bridges. The battles ensuing have been the topic of films such as *A Bridge Too Far* (Attenborough 1977). The same theme of guarding a bridge also turned into a powerful metaphor for the German antiwar film *Die Brücke* (Wicki 1959). A number of visual cues and a wide range of thematic references remain in *Medal of Honor: Allied Assault*. In fact, the game’s origin itself points back to Hollywood and Steven Spielberg, who is still credited as creator of the series. The *Medal of Honor* series clearly aims at a dramatic depiction of World War II with a focus on atmosphere and action. Still, few of the critical notes that defined similarly themed movies remain in the game, which concentrates more on heroism and pure action. My virtual killings of enemy soldiers to save that bridge are never questioned in the same way that similar actions are, for example, in *Die Brücke*. *Die Brücke* tells the story of some students, who are positioned as the last line of a senseless defense against the approaching superior Allied forces. It concentrates entirely on the stories of those German troops that remain faceless and nameless opponents in *Medal of Honor*.

The difference in relevance is also apparent in the use of space in the game. Unlike any physical demolition, the destruction of the game bridge is an interchangeable game state. If I fail in my guarding mission, the same scene restarts and the bridge is intact once more. The restart not only resets the event time of the game world but also the spatial setting, the event space. In a world where spatiotemporal settings are game states and basic variables of a rule-based system, the buildings fade to mere possibilities. This applies to in-game architecture as well as any other “body” that inhabits the virtual stage—including the player’s character. In *Medal of Honor*, as well as in most other first-person shooter games, the player-character can be healed—reconstructed—almost at will. That certainly changes but does not necessarily erase the significance of a virtual death. One earlier mission of *Medal of Honor* is another reenactment of the D-Day landing at Omaha beach.

As character Mike Powell, I find myself on a landing boat approaching the beach with no means to escape the counterattack. It is a claustrophobic and scary situation that—like the entire sequence—borrows moments from Spielberg’s own version of the D-Day attack in *Saving Private Ryan*. I reach the beach and try to use any cover I can find on my way to the cliffs, but I keep failing. Mike Powell dies again and again. Thanks to the reload function the virtual death can easily be dealt with and the game resets to the last save point. This surely is no realistic simulation as I cheat death constantly. But even with that cheat the experience of virtual deaths is overwhelming to the level of frustration. After Mike Powell has been shot by virtual snipers, killed by virtual machine guns, blown up by virtual mortars, and annihilated by virtual mines, I start to reflect upon the situation. The overall game might remain a kind of World War II theme park ride, but at that moment I get a glimpse of an antiwar message because body and space are interactive game states that I can play with. The shocking deaths of the historic attack cannot be recreated by either film or game but reinterpreted by both media to evoke some new understanding in their audiences—I find myself experiencing exactly this effect.

Computer values that give birth to the navigable space can be set to naught and the world might simply disappear, but the effect of that reset can be expressive and significant for me as the player. Through active participation in this world, the player can add to it and become a part of it—own it—even though it might all just disappear in the next minute. At times, players can revolt against such a data disappearance.

The player community of the beta-test for the online world *Uru* (Miller 2003) was told that the game would not launch into the commercial stage. But during the test, the online world had become the home for a great many social interactions and had turned into an important place for the players. Their virtual “home” was on the edge of oblivion. Players met and debated possible steps and literally emigrated from the *Uru* world into other online universes such as *There* (Harvey et al. 2003) or *Second Life*, where they recreated the locations of their *Uru* “home world” (Pearce 2007). This reaction points to another option in video game spaces—the creation of space. Instead of changing an existing virtual environment, these virtual emigrants created new spaces to inhabit based on the technologies provided by the system.

Digital space can be created and extended whenever desired and is not limited by any physical restrictions apart from the computer’s hardware and software. Good examples of this are procedural game worlds that create game spaces in real-time during gameplay. Procedural game spaces have been implemented in a small number of game titles, most notably in *Rescue from Fractalus*

(Fox 1986), as well as in architectural systems (e.g., Novak 1991, 1996b; Parish and Mueller 2001; Wonka et al. 2003), and art and research projects (e.g., Furmanski 2005). Modern games often use (random) level generators as space generators for new game levels, as implemented in the *Age of Empires* series and the *Diablo* series, but also in the classic predecessor for *Diablo: Rogue* (Toy, Arnold, and Wichman 1980). Wichman (1997) wrote, “Most of the existing adventure-type games had ‘canned’ adventures—they were exactly the same every time you played, and of course the programmers had to invent all of the puzzles, and therefore would always know how to beat the game. We decided that with *Rogue*, the program itself should ‘build the dungeon,’ giving you a new adventure every time you played, and making it possible for even the creators to be surprised by the game” (ibid.).

Yet the generation of space and the interactive access of the player to this world remained unconnected. Instead, level generators create more or less random game spaces.

The other extreme is world generation by players, as seen, for example, in *Second Life*. Here, the game space expands with a growing user base and gets more detailed the more this user base adds its own content to the virtual playground. In these cases, the world creation happens independently from the existing game universe, as seen in *Second Life*, or independently from the player, as in *Rescue from Fractalus*. Game space and agency of the player in relation to its generation are not balanced.

To change this, we started a research project, called *Charbitat—Game Characters and Procedural Spaces*, at Georgia Tech and incorporated this feature in our basic design principle (e.g., Nitsche et al. 2006). Unlike other games, *Charbitat* generates game spaces based on the player’s attributes and actions and not on predefined or random data. In the single-player prototype of *Charbitat*, the player controls a little girl on a quest through a vast—in fact endless—game world. As in other 3D adventure and exploration games, the hero is attacked by enemies, has to master the environment, and find certain key elements to overcome thresholds and to proceed. But in *Charbitat*, the way a player chooses to play (which enemies to kill, what path to chose) affects the gradual generation of the underlying game world.

The world of *Charbitat* is split up into tiles—each one about five hundred virtual meters across. Beyond the existing tiles is a sea of clouded emptiness. Whenever the hero reaches the borderline into this void and steps forward, a new tile is generated at that location. The player is creating the world as she plays through it. The result is an ever-expanding game space. This world is codefined by the player’s behavior. Depending on the actions of the player, certain values attached to the hero change, and these values are then mapped

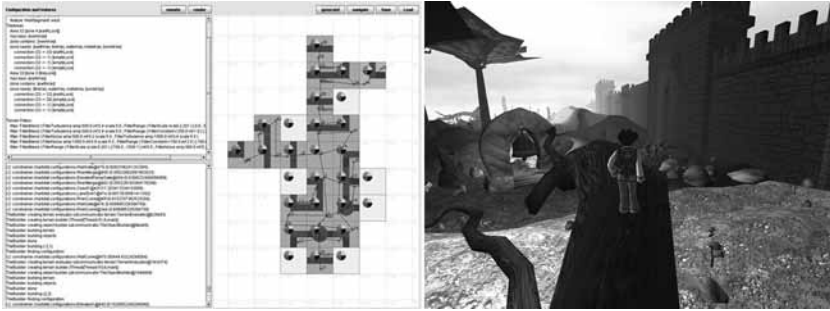


Figure 10.1 *Charbitat*: example of height-map generation and assembly into a tile-world in the underlying Java code (left) and actual screenshot of the 3D world (right)

onto the expanding game world. The in-game world is created for and in reference to the player while he or she is playing in it. Technically, *Charbitat* is a modification of the *Unreal* engine used for 3D world presentation and interaction, but whenever a new tile is needed, a parallel running Java application (coded by Calvin Ashmore) receives the variables from the game hero, generates a height map in dependency to these player attributes and the surrounding tiles, assembles the tiles in a grid-like map, and sends the information back to the *Unreal* engine, where the actual 3D world is processed.

The result is an ever-expanding game universe—a feature unavailable in physical space and outside Norberg-Schulz’s definition. The challenges that such a space poses are manifold. Apart from a whole range of gameplay issues, we faced questions such as: How can we find our way in an infinite space? How can we structure context between regions in this world? While the virtual bridge of *Medal of Honor: Allied Assault* is in danger of becoming an arbitrary variable, the same rings true for infinite game spaces like that in *Charbitat*. What started as an experimental game dealing with new forms of 3D space generation had to become a project about the generation of context to avoid meaningless worlds. In the case of *Charbitat*, the content was arranged in procedurally generated key-lock puzzles that form basic quests used to block off some section of the world and send the player searching for the key to overcome these thresholds (Ashmore 2006; Ashmore and Nitsche 2007). The positioning of thresholds and keys to overcome them evolved into a conditional network of structural elements for the player’s exploration of the game world. Enemies populate the virtual stage and dramatize the progress further and procedural camera work is applied to the spatial exploration.

Projects like *Charbitat* still refer to cultural spheres—in our case to references to Asian art and philosophy—but the space generation is player-driven

instead of designer-dependent. Beyond making a space more *precise, complementing* it, and realizing it as a *symbol* and cultural object, players have become masters of experiential space itself as *destruction* and *creation* have become forms of interaction on virtual space. Whether it is the virtual bridge in *Medal of Honor* or the infinite game worlds of *Charbitat*, these titles still contextualize their spaces, filling them with evocative narrative elements and assisting forms of presentation to support a meaningful fictional plane on the player's side.

Examples of Spatial Structures in Game Spaces

Even if players gain access to the space-generation process, some structure has to be provided either from the player or the system. A number of significant spatial structures will be discussed in this chapter to specify what practical shape the architectural references take in the world of video game spaces. These structures arrange the spatial units in their own way: paths, edges, and regions, as well as the use of textures, vistas, and colors, define their appearance and functionality. Based on the connection between the spatial logic of architecture and its implementation in game worlds, this chapter closes with an abstracted model for space-driven functionality. In many ways, this model is a large-scale version of the argument for evocative narrative elements in game spaces, one that projects them into larger terrains and levels.

“Playground” and “sandbox” are often used as metaphors for virtual spaces. Both are useful to describe certain capabilities of video game spaces, and both emphasize the placeness of game worlds. Yet these metaphors do not primarily describe a spatial structure. The massively multiplayer online world of *Second Life*, for example, provides tools for its users to create their own structure on patches of virtual property. The world functions like a giant sandbox that allows its inhabitants to form structures out of its rule system and already existent objects. Similarly, a given environment such as Liberty City in *Grand Theft Auto III* is seen as a playground because its open architecture allows for relatively free play. The differences between the two highlight the problems of the metaphors: they do not refer to the structures (initially open virtual flat terrain in *Second Life* versus a virtual city in *Grand Theft Auto III*) but focus on their use, which is very different in both cases.

Another problematic spatial metaphor often used is the concept of a game space as a garden. The garden itself has grown into a metaphor, most famously perhaps in the “Garden of Eden,” and the word has long spread beyond a simple description of a somehow landscaped piece of land. “Gardens are rhetorical landscapes” (Mitchell, Moore, and Turnbull 1988, 49) whose spatial arrangements suggest a quality that is absent in truly natural landscapes. This quality can differ widely. A garden of herbs serves a different purpose than a botanical garden, or a sacred garden, or a representative garden, or a narrative garden. These differences are implemented through different spatial designs. On the one hand, the garden “is a place that embodies the spirit of humanity in its association with nature” (Stein 1990, 40). On the other, one might see a form of garden in the temporal arrangement of cars on a parking lot, where almost every aspect is controlled by human construction (Groth 1990). A garden can be the smallest possible unit, for example a balcony, or a national park. In this way, a garden becomes a perceived quality itself. One person’s dump might be another person’s garden.

As a result it is exceedingly difficult to determine a single spatial definition of the garden. There are a great number of guidelines for the construction of gardens, from the *Sakuteiki* written in the eleventh century to the monthly publication of *Home & Garden* today. Neither describes a single spatial structure. Instead, gardens offer a conceptual filter through which one might experience space differently. They are individualistic pieces of art. The resulting spaces are often described as prime examples of “places,” which is a quality that will be discussed in more detail in chapter 12. The garden and sandbox metaphors might not be very precise, but they are far from empty. Two elements of gardens are the completeness of their microcosms within given boundaries—which parallels the restrictions of a game world; and the gradual revelation of their specific quality through exploration—which resembles the exploration of a game level (Gingold 2003; L. N. Taylor 2006b). Gardens become the door into the introduction of architectural structure and debate about the analysis of game space. Another door would be urban planning, for example. Both suggest specific uses of space and point to the value of spatial structuring, but they do not suggest any precise spatial format.

11.1 Tracks and Rails

One distinguished spatial form in video games is the track. In its purest form it is realized as a single axis. Although digital media allow instant teleportation, this axis and the movement along it remain important enough for Benedikt to ask for a “principle of transit” for cyberspace: “This principle

states that *travel between two points in cyberspace should occur phenomenally through all intervening points, no matter how fast (save with infinite speed), and should incur costs to the traveler proportional to some measure of the distance*" (1991, 168; italics in original).

The connection of points through movement in virtual space is elevated to a principle structure of cyberspace itself. In practice, this axis is transformed, twisted, and bent to structure movement along it. Racing games such as the *Gran Turismo* series incorporate visible racetracks and reconstructions of existing racecourses. The virtual levels mirror the real world's spatial limitations and the driving experience. They might simulate weather conditions, individual tire behavior, or road conditions, but they always lack other important elements of "real-world" racetrack design such as the safety of the spectators or the context of the site, environmental suitability, or corrosion of the track over time. They cannot aim for an architectural simulation but for a movement simulation and the overall game space's visceral impact. They reproduce the racing experience—the fast-paced, goal-oriented, and usually competitive striving to get ahead. Consequently, dominant features of the track focus on this visceral experience of racing space. The most basic racetracks feature straight lines with clear start and finish lines. Early Olympic races, for example, used stone markers to mark the starting point and end of a straight racetrack. The track itself excludes any visual diversions, obstacles, or intersections. Even competitors are confined to their own subsection of the track to exclude any interference. The structure aims to direct and confine movement and demands that the runner optimizes velocity and velocity only. "The racing track became the icon of modern functionalism, materializing the modern belief in the 'natural' hegemony of the straight line and the right angle. If this credo can be called the modern religion, then racing is its ritual" (Eichberg 2004, 3). The racetrack itself is a cultural place, much as the ancient Olympic games were a ritual that was tied to religious and spatial rites.

Oval tracks allow for a continuous race but keep the basic restrictions. Runners are only allowed to race on the designated path. Shortcuts or reversing direction at will are forbidden. The same applies to a pure video game racetrack: players have to minimize the time by optimizing mastery of track and interaction with the vehicle in *Gran Turismo 4* (Yamauchi 2004) or *Grand Prix Legends* (Cassidy et al. 1998) to win a race—not unlike a real racing driver. Players hardly notice the amazing backdrops of a track or the high-detail textures of the road in the latest *Gran Turismo* installment. They always strive forward to a destination beyond the current position.

The precision of any physical simulation in a game world is optional. The racing cars of *Grand Prix Legends* might attempt the accurate reproduction of



Figure 11.1 *Wipeout XL* (Burcombe 1996): the Gare D'Europe racetrack (left); *Wipeout XL* in-game view (right)

the historic engines but the hovering spaceship racers of the *Wipeout* or *F-Zero* series replace the Formula 1 physics with far less realistic models. Where they lack the necessary physical involvement that provided the tension in the realistic track design, they add a range of other features to the track to increase dramatic engagement. These include a flurry of bright colors to increase the perception of speed, twisted tracks not unlike those of a rollercoaster, exaggerated sound design, and far jumps to emphasize speed.

This results in different layouts for the necessary racetracks. While real Formula 1 tracks have to consider the limitations of the cars and conditions for the site, the new racing vehicles allow for new spatial layouts. Because the racing ships in *Wipeout* allow spectacular jumps, gaps appear; their ability for sudden turns allows an increase in sharp curves; looping and extreme deformations of the track became available; the absence of audiences led to floating tracks through futuristic environments. Despite all those changes, the basic premise of the race is kept intact: that of competitive spatial advance along a strictly predefined track. In many ways the unrealistic racing games are more elaborate in their spatial adaptation of the race experience than their “realistic” counterparts. The games might not be able to realize the factual physical racing components, but their tracks are designed to balance this through an emphasis on a spectacular restaging of the racing experience. These racing games remediate the racetrack into the virtual. Their track layouts emphasize moves such as drifting, jumping, and sliding, to capture, intensify, and lengthen key racing moments.

But games have adopted the metaphor of the track also in other form. So-called rail-shooters move or guide the player along invisible tracks that

allow little divergence from a given path. The world might appear to be accessible but can be navigated only in the confines of a very limited set track. Because this track's layout might not be clear initially to the player, this kind of approach includes an element of discovery. It is a guided journey along which the individual points are important. As a result, the game space changes completely. Instead of the highly functional and obviously restricting race-track, the invisible rail often uses a range of methods to engage the player with the track itself. These structures keep the rail interesting and engaging instead of pointing only to the goal. In one obvious racetrack design, the position of other competitors during a race is immediately visible. No obstacles are in place and no divergence from the given path is allowed. Invisible rails add excitement to the game experience by breaking these rules and guiding the player along some form of interactive theme-park attraction. Variations might occur, but the spatial design for the de facto exploration remains limited. Any player of the early *Medal of Honor* titles is taken on a ride along prescribed events and battles that demand not sheer speed but a range of different interactions. Speed might be part of the equation and time limits might apply, but time is not the single most important value. The game world is not optimized for velocity alone but for a variety of interactions. The track turns into something like an adventure obstacle course.

What emerges, in the case of *Medal of Honor*, is a new primary objective: exploration and survival in an often highly dramatized environment. Visibility can change constantly through the use of dynamic presentation and the functionality, and conditions of the game space change constantly too as objects appear and pathways change. Developers restrict players' progress to a given path (or limited paths) to manage the complexity of these encounters and arrange them as dramatically as possible. But the restrictions are not simply production-driven, unwanted necessities but can be used as valuable structural directives. In my battles through *Medal of Honor's* World War II scenario I find my way blocked by minefields, ripped open by explosions, and hidden in a fog of war. These limitations can provide valuable structure for a player's experience. Krzywinska has pointed out that "through the juxtaposition of being in and out of control, horror-based videogames facilitate the visceral and oscillating pleasures/unpleasures of anxiety and expectation" (2002, 217). She expands the question of control to horror-specific conditions but the same basic juxtaposition is at work in *Medal of Honor*. Being tied to the path of fate through the game world might restrict the player's impact on the world as such, but it is a valuable part of shaping the player's involvement.

Galyean suggested an abstract concept of a possible spatial structure for narrative in virtual spaces. He distinguishes between a "plot level,"

“presentation level,” and “viewer level” in his design approach. The plot level contains the “high level goals, intentions, and events of the story” and is detached from the rest of the environment (1995, 31). He suggests a “river analogy” to shape the events effectively on the plot level: “Instead of linking a sequence or branches and nodes, I suggest that paths through a narrative be more like a river flowing through a landscape. The audience is a boat floating down this river with some latitude and control, while also being pushed and pulled by the predefined flow of the water. . . . This constrains the user to stay within the banks of the river while giving him/her the ability for continuous interaction” (ibid., 58–59).

Although the river is introduced as an analogy and not necessarily as a direct spatial structure, it implies spatial structuring of the exploration along a limited number of given path(s). One does not know where the journey might end and how to master the surprises behind the next bend of the river because the structure and the ingredients of the space might change at any given moment.

The restrictions of tracks and rails might affect the range of available choices and restrict interactive access to a shadow of its potential, but if the restriction is a meaningful part of the desired experience, then these spatial forms offer valid structural means to the game world. Whether they show their structure through enhanced visual cues, as in the *Wipeout* series, or hide them with even more visual distractions, as in the *Medal of Honor* series, tracks implement a guiding force in the game world. The interaction with this structure can vary from sheer speed to gradual exploration, but the spatial construct allows for a dramatic shaping of this interaction. This is the difference between the jumps in *Wipeout* and the unexpected yet prescribed events in *Medal of Honor*. Tracks thus can locate the spatiotemporal conditions for any such appearance very precisely as they restrict exploration beyond the given boundaries. They map a dramatic structure onto lines.

11.2 Labyrinths and Mazes

The growing complexity of track arrangements leads into the discussion of another important spatial form in digital media: the labyrinth. Labyrinths play with the notion of hierarchy as they lack outstanding visual cues that can support orientation and instead often feature repetitive rhythms of recurring patterns. At the same time, and unlike the hidden rails of *Medal of Honor*, the labyrinth usually puts its restriction on display. Exceptions are mirror-and-glass mazes where even the walls have to be found. Architectural theorist Kevin Lynch agrees that exploration of the unknown—as seen in the hidden

rails and the labyrinth's paths—can provide joy: “This is so, however, only under two conditions. First, there must be no danger of losing basic form or orientation, of never coming out. The surprise must occur in an over-all framework; the confusions must be small regions in a visible whole. Furthermore, the labyrinth or mystery must in itself have some form that can be explored and in time be apprehended. Complete chaos without hint of connection is never pleasurable” (1960, 5–6).

As with the design of tracks, the spatial arrangement of the labyrinth needs structure to be pleasurable. Eco argued that there are three types of labyrinths, to which this chapter adds a fourth type:

- The *linear* or *unicursal* labyrinth that consists of one single path.
- The maze that offers branching and *multicursal* forms.
- The *net* or *rhizome* in which each point can be connected to any other point (Eco 1984).
- The *logic maze*, a conditional maze that depends on changing access conditions that shape the available space.

As will be explained in the following paragraphs, the three first forms coexist in video game spaces and apply spatial structure to position narrative elements within them. This effect will be illustrated in a discussion of the video game *Zanzarab: The Hidden Portal* (Nitsche 2002). I was involved in the title's production and had full access to the design documents. This allows a complete look at the construction of the game's space beyond the player's experience and into the factual maps and level design decisions (Nitsche 2007b).

The dramatic setting of *Zanzarab: The Hidden Portal* mirrors many other fantasy settings for video games, movies, and novels. I control a teenage girl, Amy, who has been called from her “real” home in London to save a magical



Figure 11.2 Unicursal: Chartres cathedral, twelfth- to thirteenth-century labyrinth (left); multicursal: Hampton Court maze, planted 1702 (right)

parallel world: Zanzarah. While exploring the game universe, I realize that the overall game world is divided into three main sections: (1) the London “reality”; (2) the magic quest world of Zanzarah; and (3) the separate world of the virtual fairies, which can be accessed via the quest world. Throughout the overall quest I find hints that flesh out an underlying backstory. It seems that these three worlds were once united but got separated. Their discontinuity is the source of all evil. The main objective for Amy and me is to reunite the separated worlds through her unique ability to access all of them and fight evil on every level.

Zanzarah’s main game world, which hosts the central quest, is an example of a multicursal maze where players can explore the world freely but may become lost. These levels include forests, gardens, or cave structures that provide ample opportunity to lose one’s way. In these levels, the player meets various evocative narrative elements such as characters, thresholds, and useful objects. Their arrangement within the maze provides a certain structure for the player’s exploration and sets new directions. The game often sends players on extended searches and they have to retrace their steps and return to former locations, crisscrossing paths already taken as they progress.

In order to progress through the game, I have to fulfill certain tasks that unlock more options within a growing network of accessible locations. In many ways, this arrangement of narrative elements presents a unicursal path overlaid onto the maze. Their conditional combination is the main quest the designer has envisioned for an “implied player.” Although not strictly linear—there are parallel options/tracks available and manifold distractions—this projected quest winds through the world with many elements of a unicursal path. A simple walk-through would document this path’s various twists and turns and force it into a linear description. In practice, players have to

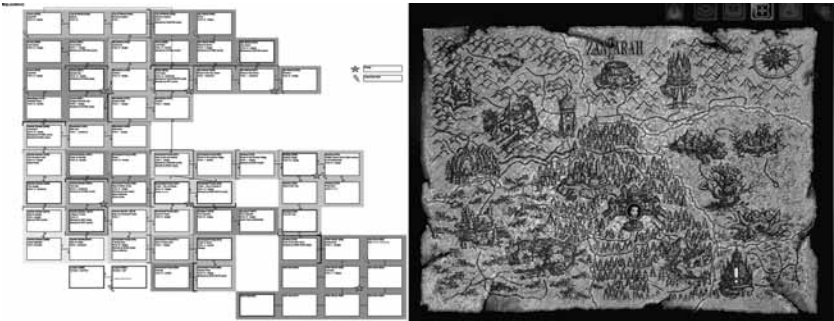


Figure 11.3 *Zanzarah* design document: excerpt of the rule-defined game space (left); in-game map (right)

constantly negotiate whether to strictly follow this solution or divert from the main quest and explore more options. Occasionally, it is even necessary to leave the main path. Amy's fighting powers depend on the development of all the fairies she collects during her travels through Zanzarah. These fairies start off as weak low-level characters but can be developed and improved through continued training and fighting. Certain faerie conditions can be the key to overcoming a specific obstacle or hostile enemy character; thus I have to increase my faerie arsenal. The best way to do that is to roam through the game world sections that have been unlocked so far and find new challenges and fights to train my fairies. I have to divert from the main quest to reach a certain condition in order to proceed.

At other occasions, players might be confused about what the central quest is and diverge into different adventures. The preimplanted quest might be seen as Ariadne's thread laid out by the designer through the game world and picked up by the player—or left aside.

Information and evocative elements are spread in a certain pattern that helps to shape the gaming experience. Using maze-like structures was a logical consequence of the gameplay implementation. *Zanzarah* certainly did not follow a fundamental pattern or academic framework but was implemented with a "gut feeling" for what seemed right and feasible.

As discussed earlier, the monomyth is one possible guideline for such a shape. *Zanzarah*, like many other titles, includes key elements of this unicursal pattern. The separation between the "real" London and the "fantastic" world of magic simulates the passing into the world of the adventure, the design document mainly assembles thresholds that have to be overcome with the help of either certain abilities or items, many non-player characters have specific pieces of information to help the player locate the preplanned quest, and the ultimate reward in *Zanzarah* is the reconnection of the separated worlds—a healing of the initial wound. To clarify: these are the preplanned evocative elements and not the game's "story." Any player's personal experience and narrative comprehension of the game world differs from this path and is generated only through individual play. However, the reference to monomythical motifs in the layout of the pre-envisioned quest illustrates how designers can map one on the other.

Finally, *Zanzarah* also offers a reference to the concept of the net in the quest world's connection with the numerous battles that happen along the way. Every battle is staged within closed environments that are part of the third section in the game: the fairy realm. Players access these spatially distinct pockets via teleportation and have to face enemy characters in a first-person shooter setting.

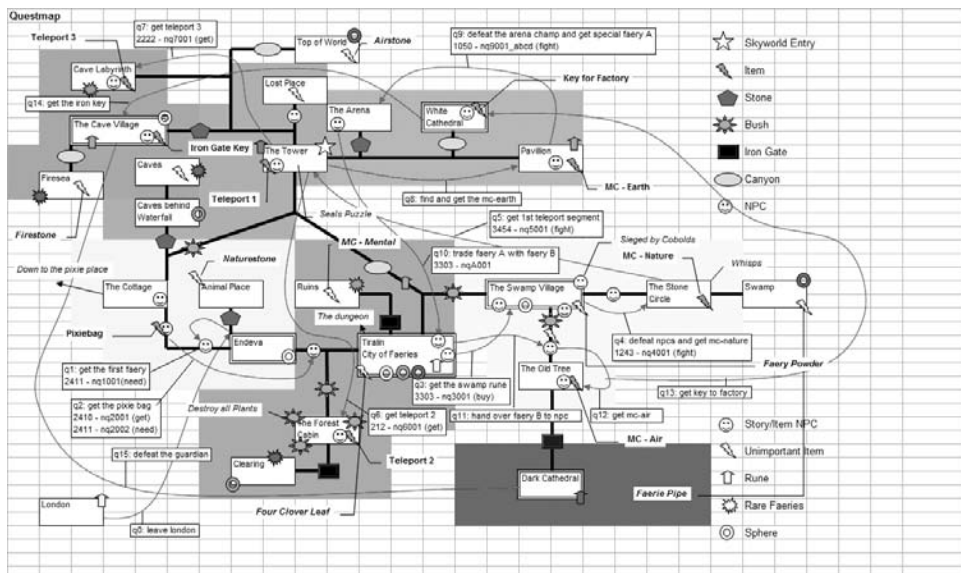


Figure 11.4 Zanzarah (design document excerpt) illustrating quests within the game world: curved lines indicate origin of a quest and the area that allows for its completion; icons represent specific entities such as characters, treasures, and blocking threshold guardians

I steer Amy past an unsuspecting rock formation in the Northern icy lands of Zanzarah, when a tiny aggressive faerie jumps right out of the solid virtual rock and challenges me. If I accept the challenge the camera follows the fairy as she returns back into the virtual rock. The control scheme changes from the exploring Amy to the fighting fairies, and I find myself in a different subworld that seems to be somehow interwoven with the main quest world. Depending on the outcome of the fight, I am teleported back to the quest world or the “real” world of the London home.

Teleportation and the almost arbitrary encounter of the battle arenas in the quest world carry the notion of the net, where any point of the world can be connected to any other location. Notably, all three labyrinthine forms exist in parallel and players have to travel through all of them in order to play Zanzarah to its full extent. This parallel use of the various forms answers to Aarseth’s call for a reformulation of the labyrinth in digital interactive media (1997, 5–9). Aarseth refers to Doob (1990) when he suggests that parallel use of different labyrinthine forms points back to older medieval interpretations of the concept of the labyrinth. Any player of Zanzarah encounters a similar spatial understanding through the sheer multiplicity of

the maze formats. How *Zanzarab's* game space interconnects paths, connections, and single locations points to the concept of "striated" and "smooth" spaces.

Deleuze and Guattari established a distinction into striated and smooth space illustrated by the different tokens of two board games: "The 'smooth' space of Go, as against the 'striated' space of chess. . . . The difference is that chess codes and decodes space, whereas Go proceeds altogether differently, territorializing or deterritorializing it" (Deleuze and Guattari 1987, 353). An important difference is their understanding of lines and points: "The smooth and the striated are distinguished first of all by an inverse relation between the point and the line (in the case of the striated, the line is between two points, while in the smooth, the point is between two lines)" (ibid., 480). The principles of smooth and striated are applied to a wide variety of fields, including presentation ("Smooth is both the object of a close vision par excellence and the element of a haptic space. . . . Striated, on the contrary, relates to a more distant vision, and a more optical space" [ibid., 493]), music, and navigation (ibid., 477). They grow from and feed into a wider discussion of social phenomena.

Borrowing the initial distinction, one can observe that a game world like *Zanzarab's* combines both types. It demands a player to constantly switch from one spatial approach to another. This flexibility is fully expected by Deleuze and Guattari, who envisioned both spatial concepts in constant transition into each other. It has also been traced in other games like *Civilization* (L. N. Taylor 2006a), and Ryan comes to a comparable conclusion for hypertext (2001b, 262). Again, the constant renegotiation of the player's position is key and the multilayered quality of the game space opens it up for dynamic engagement.

Supporting this openness, each world in *Zanzarab* can itself become a narrative element, a distinct part of the player's experience. All three worlds offer not only different interactive features but are also presented in different ways. The "real" London home is a form of player inventory where important elements are stored and have to be picked up to continue the game. It is presented in sepia colors and the camera is a typical following camera that also affects the directional movement of the avatar. The "quest" world uses the same camera but offers the main narrative elements in the form of characters, puzzles, thresholds, and collectible items. It is presented in full color. Finally, the "battle" sections switch the player to a first-person point of view and lack any quest elements. They concentrate entirely on the fighting action. These battle locations in *Zanzarab* differ significantly from the labyrinthine structures and take more the form of arenas.

The quality of any labyrinth or maze is also dependent on the form of its presentation. In classical architectural labyrinths and mazes Ching's visual properties ("shape/size/color/texture/position/orientation/visual inertia" [1979, 51]) exist, often in monotonous repetition without significant differentiation, and spatial cues are minimized (as in mirror or glass mazes). This is what complicates the reading of the space and makes navigation in a labyrinth so difficult.

Because game spaces depend on the camera, the legibility of any maze, thus, also depends on the camera work. The hallways of *DOOM* are reduced to 2D labyrinths presented in a 3D first-person point of view from within the maze. Once the camera delivers an all-revealing overhead view of the structure (see, e.g., in *Pac-Man*), the function of the structure changes. Switching the camera from the first-person point of view to the overhead navigable map view in *DOOM* (as outlined in chapter 7) also changes the space from a clearly forward-directed trajectory through the corridors to an all-including regional overview. Smooth and striated meet again in this constant double-exploration of the game world.

The *Pac-Man* maze is experienced in its whole condition at once, which mirrors the representation in arenas that often have wide-open vistas that try to simplify the spatial perception. In the arena the task is to solve a set problem, such as a fight, a dance, or some other form of skillful performance. The presentation of the skill dominates over a less predictable exploration of space. A labyrinth, shown in an overhead view, mimics this focus on skills and reduction of spatial exploration because every path is revealed, no surprises lurk behind dark corners. The task in a labyrinth, shown in an overhead view, is comparable because every path is revealed. Players cannot get lost; instead the game space becomes a puzzle to solve with all pieces visible and all paths laid out. The challenge is the best possible performance in a fully presented space.

Logic or multistate mazes address this challenge and complicate it through logical puzzles. One does not solve the task simply by navigating or dealing with some objectives encountered in the space, but through careful analysis of the implemented conditions between spaces as such (Pegg 2003). The labyrinth/game space is completely revealed but is a complex puzzle in itself that needs to be processed. Consequently, the various forms that these puzzles can take have been used for learning (Madden and Howley 2003), and embedded in their logical systems one can find computational problem-solving strategies (Hearn 2006).

Roger Abbott, a pioneer of the logic maze, created multistate walk-through mazes as navigable attractions. Notably, one of his references for the logic

maze is the “Colossal Cave” game space of the original *Adventure* with its conditional linking and the option for changing conditions (for discussions of *Adventure*, see, e.g., Nelson 1995 or Jerz 2007). Indeed, the conditions of the mazes remind one of hypertextual node structures, as seen, for example, in Abbott’s *Bureaucratic Maze* (2003). The maze is built around five physical desks located in an open room—like spatial nodes on a free playing field. Each desk has an own label.

When you enter the maze you are given a form that says, “Take this to the desk labeled *Human Resources*.” You look for the desk with the nameplate *Human Resources*, you hand in your form to the bureaucrat at that desk, and he gives you another form. This one says, “Take this form to *Information Management* or *Marketing*.” Hmm, there is now a choice. Let’s say you decide to go to Information Management. You hand in your form and receive one that says, “Take this form to *Employee Benefits* or *Marketing*.” You decide on Employee Benefits where you receive a form saying, “Take this form to *Corporate Compliance* or *Human Resources*.” (Abbott 2005)

Labyrinths emerge not only as structures that form one typical form of game levels, but also as results of the exploration of virtual space. The virtual journeys of players criss-crossing the available space can be interpreted as the creation process of a labyrinth of experienced locations. Their movements form a spatial practice, and this practice leads to a labyrinthine space. To keep this structure as dynamic as Abbott suggests, these game worlds need to be highly procedural. The procedural world generation in *Charbitat*, for example, might be able to provide the necessary complexity and dynamic world. The narrative model of the quest emerges again from the conditions that structure the movement that are spatially restricted and thereby shape the player’s experience. As such, labyrinths remain compact, evocative narrative environments.

11.3 Arenas

Arenas are mostly open structures with one dominating demarcation line: the surrounding enclosure, which is essentially a datum in Ching’s definition. In contrast to the labyrinth, they feature few visual clues that draw attention to the place as such. Instead, they provide the canvas for a performance. Whether it is a football pitch, a boxing ring, or the coliseum, arenas provide relatively free movement in a contained space with high visibility, while labyrinths restrain movement to a complex space that complicates comprehension. As a result, the arena’s spatial arrangement often supports events such as battles, dances, or speeches that demand skillful operation of the avatar, often in collaboration or competition with others. Stone, for example, highlights

arenas' value when she refers to video games as “arenas for social experience” (1998, 15; italics in original). In contrast, the space of the labyrinth can itself become the very opponent to overcome, and individual mastery of the maze can dominate any social engagement.

We cannot simplify the labyrinth as solely a challenge to the individual and the arena as strictly a place for social activity. Too many cooperation modes in games from *Gauntlet* (Porter 1985) to *Dungeon Siege* (C. Taylor 2002) engage players in co-op play in the exploration and conquest of mazes and labyrinths. But arenas display their own spatial intricacies.

In *Zanzarah* arenas are used to stage the fighting sequences. They are separate locations outside the quest world with a different interaction design. Multiplayer functionality is reduced to these arenas, and players meet in only these secluded environments to prove their mastery in ongoing battles.

Arenas' spatial conditions differ wildly from labyrinths or tracks. Labyrinths offer few orientating reference points in a repetitive and disorientating structure; pure racetracks offer little else but these orientation points that mark start and end position, invisible rails hide their own shape behind numerous of those markers along the way. However, a virtual arena is often less exploratory and more of a contained location. Arenas in games either reduce their functionality to a sheer backdrop (as seen, for example in the arenas of many classic fighting games such as *Tekken* or *Virtua Fighter*), or they include objects in their design that follow specific rules to address spatial balance. A game such as *Quake III: Arena* can become frustrating if one player or one team gains an unfair advantage through spatial design. Instead, no player is allowed to get a lead over another through the game world alone. All players in a *Quake III: Arena* match have to be able to reach the supporting items in time and use them. Height condition, visibility patterns, distances to objects—every element of spatial design is balanced.

The result can be a kind of mirrored game world where both sides start at opposing, yet equally designed ends of a map to guarantee a fair setup. *Quake III*'s map *The Longest Yard* is a “capture the flag” environment in which two opposing teams of players try to reach the base of the other team, steal their flag, and bring it to their own base. Collaboration and individual skills during the attack are the keys to success, as neither side has any advantage over the other in the architecture of the game world. *The Longest Yard* map even features equal lighting conditions to balance visibility. Both sides have main lights at their bases; no player can hide in a specific shadow spot or sneak through hidden passages. At the same time, the level consists of numerous jumping pads and small platforms floating in open space. Any navigation error is immediately punished with certain virtual death, and mastery of space is a



Figure 11.5 *Zanzarah*: a spatially restricted battle arena (left); the open spaces of the quest world (right)

necessity. This game world is a classic arena combined with spatial challenges that are meticulously balanced.

But balancing a map does not depend on such mirrored spatial conditions. The most acknowledged, most played maps of the *Half-Life* modification *Counter-Strike* are not symmetrical. These structurally unequal maps can be balanced through different objects and objectives within the map. How to balance level design has been the point of many debates not only between players but also creators (Tagliaferri 1996) and analysts (Bartle 2004; Byrne 2005). The balance of these complex arenas is ultimately a work of art that emerges from the game design process. The different forms of balancing can be illustrated with basic differences in spatial design in *Quake III*'s "capture the flag" mode and *Counter-Strike*.

Both games pose two teams in opposition to each other, navigating the game world to reach certain locations and fulfill certain tasks there. *The Longest Yard* sets them up as opposing teams with exactly the same task for both sides. In contrast, *Counter-Strike* divides the teams into one of counter-terrorists and one of terrorists with different objectives to achieve against each other. Where counter-terrorists have to infiltrate the hijackers' hideout, free the virtual hostages, and lead them to safety, terrorists have to hold their position and keep their hostages captive; where terrorist have to attack, plant a bomb in a designated area, and prevent counter-terrorists from defusing it, counter-terrorists have to prevent this undertaking; where counter-terrorists have to guide a single virtual VIP to a safe spot, terrorists constantly ambush their attempts. *Counter-Strike* teams have opposing goals but not diametrically so. The level structures incorporate these differences. Consequently, they do not offer any mirrored stages but balance the spatial interaction asymmetrically. Access, visibility, and navigability are variable throughout the environ-

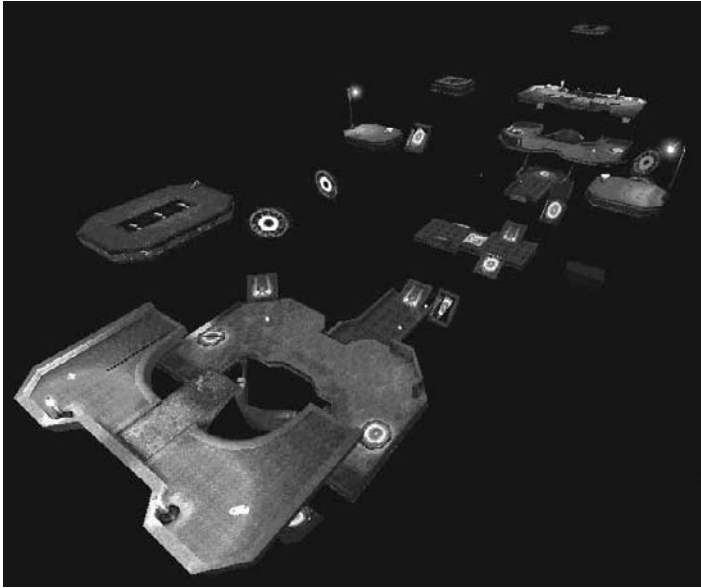


Figure 11.6 *Quake III: Arena* in the *The Longest Yard* map; mirrored spatial structures for opposing teams

ment and far from symmetrical. For example, terrorists hold hostages usually in virtual interiors and the counter-terrorist coming to the rescue often has to pass some open territory to get there, often exposed to virtual snipers. Alternative routes might be single-path structures that can become central choke points of condensed action.

The *cs_militia* map of *Counter-Strike* was created by Andrew Aumann and uses a hostage-rescue setting. It clearly can be dissected into tracks, open arena-like spaces, and even small maze-like interiors that illustrate the dynamics of such an asymmetrical map. In contrast, players of *Quake III: Arena's* *The Longest Yard* always start with the same predisposition, the same opposing goal, and the same spatial configuration. Tactics in *The Longest Yard* still depend on spatial design. For example, the level features special sniping platforms, but this design is equal on both ends of the map, and action differs because of varying spatial behavior not because of asymmetric level architecture.

The Longest Yard might be a clearer arena structure than *cs_militia*, but experienced players of both maps know the spaces in great detail. Because these maps are played again and again, neither offers any exploration or surprising details after the initial encounters. Thus, a player's approach to *cs_*

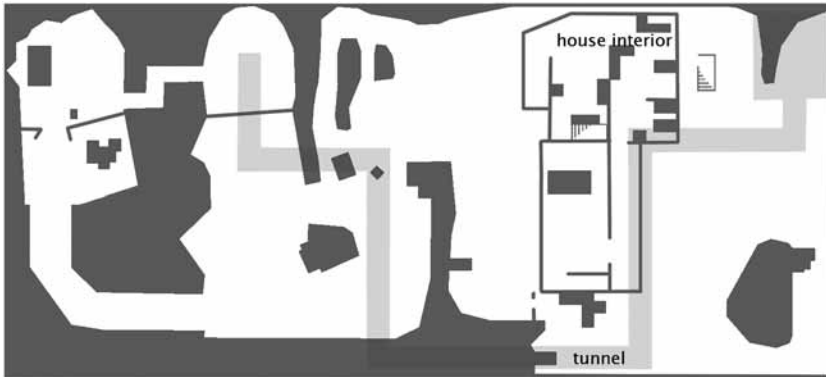


Figure 11.7 *Counter-Strike*: a simplified view of the *cs_militia* map ground level and tunnel system

militia mirrors an arena principle, although its structure is a mixture of various forms. Where the gaming condition is not equal, there the spatial conditions must not be equal or they would continuously favor one side.

11.4 Driven by Space

So far, architectural structures have been combined from the smallest possible level (see Ching 1979) to the larger contextualization of space (see Norberg-Schulz 1980). Tracks/rails, labyrinths/mazes, and arenas come to life through these architectural details and foster certain forms of interaction. While this arrangement might not be complete—for example, a different argument might work at the level of the room and house and concentrate more on relations of inside and outside—it nevertheless provides a set of spatial patterns.

Through such patterning, space structures the evocative narrative elements and a player's experience of them. This space dependency might be called the space-driven model for content assembly. It provides an abstract model for space as the structural force of interactive events. Here, the virtual stage becomes a canvas, and the structures used within it, the tracks, rails, mazes, arenas, or others, are large-scale evocative narrative elements. Logical connections are still crucial but are combined with their spatial context.

The space-driven model for content structuring tries to simplify and abstract the phenomena outlined in sections 11.1 to 11.3 to search for a way of designing new game worlds and analyzing and evaluating existing models. Spatial logic is seen as an additional guiding force for behavior and can be

applied to exploit the narrative potential of virtual spaces. The focus here is on the use of space that shapes possible events and their visualization. In contrast to physical space, where architects can hope to incorporate features that evoke connotations and patterns of behavior in visitors, game designers can shape the functionality available at any given location more directly and therefore determine more precisely the characteristics of the event space.

Possibilities of engagement are directly built into the spatial structure. They are “emplaced,” as Foucault would have argued (1998), by their distance and relation to each other. Through emplacement, a game world designer can create what Warren Spector termed “possibility spaces” (see Jenkins and Squire 2002, 70) in a spatial sense. These provide intriguing problems and tasks as well as means to solve these problems and complete the tasks. The concept of the possibility space originated in math and is here applied to virtual architecture. In this case, a possibility space describes the options made available to the player through spatial conditions at a given moment in the game experience. The deeper such a possibility space is, the more options are provided. These options can be realized by the player into actions.

Heim argues along the same lines, stating that a “good virtual environment . . . is not an object seen in and for itself but an environment that blends into the user’s activities” (2001, 6). Heim argues for an active spatial structure that provides the interaction with an “atmospheric flow,” which, according to him, can influence user behavior. Heim exemplifies his statement with the online worlds of *V-Zones* (n.n. 1995–) and *Active Worlds* (n.n. 1995–; Heim 2001). However, both of these platforms are technically limited in their “blending” into user activities and are not goal-driven games but environments for communication and virtual meetings. More goal-related environments often use stronger spatial structuring.

To provide a simple example, one can refer back to Norberg-Schulz’s and Heidegger’s example of the bridge. Bridges can be found in many game worlds, although gravity is optional and bridges could be one of those structures that become obsolete once characters can fly or jump over any obstacle. Instead, they often have been adapted as spatial structural objects to channel interaction. A virtual bridge’s positioning, creation, and use become variables as the building process, uncovering, and usability of such a structure become conditions of the dramatic setting of the game, as seen in the preceding *Medal of Honor* case. Here, we will add another game realization of a bridge structure.

In *The Legend of Zelda: Majora’s Mask* (Miyamoto 2000), I will eventually direct my exploring and questing hero-character to a bridge that cannot be crossed because of a constant wind that blows me over the edge. Only after I

have resolved more quests and found more items to improve my abilities can I use those new features that reveal to me the source of the problem: a giant becomes visible whose breath causes the wind. I have to deal with this obstacle before I can use the bridge as a path. The spatial design and the conditions that regulate access to the bridge are evocative narrative elements that demand and structure further exploration of the virtual space. In *Medal of Honor* I defend the structure itself in a single and distinct level, while in *The Legend of Zelda: Majora's Mask* I experience it as one spatial element in a continuous world that consists of a tightly woven net of evocative narrative elements.

Ultimately, the space-driven model provides an abstraction of the spatial structures discussed, but it helps to highlight space's importance in the creation and management of any "possibility space" that otherwise might be seen as a merely conditional, rule-based interaction design question. Rules of the game can be written into the playing field, and when game space is structured, rules are structured to shape possible actions in this environment. To highlight and contextualize this simple but important fact requires the spatial model.

Virtual Places

Virtual space is a product of human knowledge and depends on logic, software, and hardware development. It lacks geographical, zoological, and most physical dependencies that heavily impact real-world locations. A digital space has no immediate context with other surrounding spaces because it can be developed separately from them, independently from building regulations or limitations in terms of height, depth, or width. It is a world defined by a universe of coordinates. That is why at its core and at the moment of its creation, it is spatial but not a place.

In order for these data visualizations to become meaningful, they have to be engaged by the player. Through the active work of the player, through comprehension and interaction, the masses of polygons can transform into places. A *genius loci* is often defined by subjective experience of the location. To establish some measure, three indicators for placeness are suggested: identity, self-motivated and self-organized action, and traces of memory. All three have been discussed as significant issues in the creation of placeness in the “real” world and should provide an entry point into the discussion of the virtual place.

12.1 Identity and Place

Laurel argues that in order to reach “Virtual Reality’s highest potential, we must reinvent the sacred spaces where we collaborate with reality in order to transform it and ourselves” (1993, 197). Laurel strives for a placeness through sacredness in virtual worlds as defined by Eliade (1987). This approach drove her *Placeholder* project that allowed interactors to enter a mythical space, filled with symbols and narrative motifs relating to aboriginal culture. The

importance of virtual worlds for sacred concepts has been debated since the early days of cyberspace enthusiasm (Benedikt 1991), and Wertheim reveals that religious and pseudoreligious elements are quickly established in cyberspace's promise of the "New Jerusalem" (2000, 255). Such promises of virtual heavens occasionally can filter through into perceptions of the physical world.

At times, these promises are taken too literally: A group around Yitzhak Hayut-Man plans to recreate the historic Third Temple as a holographic projection hovering over the Temple Mount in Jerusalem. Their idea builds on religious tradition in the waiting for the coming Messiah. Massive laser cannons are supposed to project a 3D image of the virtual temple in the sky above the Dome of Rock, beaming the "heavenly Jerusalem" into the sky over the real, existing city. Although religious as well as technological leaders shun the plans, the vision as such is an example for the still-vibrant hope for the power of a heavenly virtual world. At the same time, it is an example of a view that is detached from the traditional understanding of a physical place.

In physical space, the quality of (sacred) placeness is a holistic principle. According to Norberg-Schulz, the term describes the perceived meaning and quality of all the elements that form the place: "We mean a totality made up of concrete things having material substance, shape, texture and color. Together these things determine an 'environmental character,' which is the essence of place. In general, a place is given as such a character or 'atmosphere.' A place is therefore a qualitative, 'total' phenomenon, which we cannot reduce to any of its properties, such as spatial relationships, without losing its concrete nature out of sight" (1980, 6 and 8).

He basically reapplies Heidegger in this case, noting that places are fundamentally important for man's dwelling and "his identity depends on his belonging to places" (ibid., 6). The spatial structure of any place not only has to facilitate orientation within it but also has to contain "concrete objects of identification" (ibid., 21). As Norberg-Schulz argues, "*human identity presupposes the identity of place*" (ibid., 22; italics in original). This connection of space and identity provides a basis for identifying placeness in virtual worlds through virtual personae. It is the basis for the argument about identity in video game worlds: if human identity is tied to the character of inhabited place, then the forming of one or more virtual identities can serve as an indicator for virtual placeness of the game world in which I form them. This raises the question of what defines such a character. Based on the player-centered approach in this argument, it becomes evident that such a character does not depend on prefabricated history but on the level of connectivity that a player might develop toward the virtual over time. The character is not filled by the backstory provided by the designer but by the localized actions the player conducts with it.

Eliade mentions “privileged places” like the place of birth, and the place of one’s first love, that form “holy places” in one’s “private universe” (1987, 24). Likewise, Bachelard characterizes the house as a “privileged entity” for the study of “the intimate values of inside space” (1994, 3). A direct transfer of these places into game worlds is difficult. Players are not born in the virtual space, nor will they die there. Fundamental spatial definitions are fluid in game worlds. Notions of inside/outside are less defined in virtual worlds where collision control is an optional feature and the value of walls or other separating demarcations is questionable.

Still, a virtual character’s home inside a multiplayer world, the place of a significant gain or loss, of relevant encounters and revelations, of a first encounter with an outstanding in-game character—all encourage the assignment of some of these personal qualities onto the game space and form the player’s own identity at the same time.

Techniques to establish this identity can be seen as techniques to create placeness. As Wertheim argues: “Despite its lack of physicality, cyberspace is a real place. *I am there*—whatever this statement may ultimately turn out to mean” (2000, 229; italics in original). If “*I am there*,” then there has to be a *there*, which means that place has to exist in the virtual universe because “*I*” exist there.

In return, the specific identity that “*I*” has attained in this space is an indicator for its placeness. If a player has developed a consistent identity in the online world of *Everquest*, then the virtual space of *Everquest* has become a “place” for this particular player through the process of identity creation. For a new player, the consistent massively multiplayer world of *Everquest* might be a beautiful playground to explore, a space to master. For the longtime player, the game world has also become the home for countless social encounters with other players. Complex social structures emerge in the combinations of online players, adding even more depth to each singular character (T. L. Taylor 2006). The individual player can experience the game space as a place for dwelling rather than merely a territory. That can lead to some confusing backlashes as seen, for example, in an obviously lighthearted but telling post on the forums for the massively multiplayer game *Horizons: Empire of Istar* (Bowman and Jones 2003):

A while ago, when ice was down i created a char on Earth, just to look around and have something to do while i waited . . .
I never got around to deleting it, now i wonder, what will happen to it once the servers get merged? . . . what’s the max character limit /shard? . . . will it mess things up? (Maelowyn 2004)

Even if in a comic way, the comment shows that real and virtual player identities can—at times—swap places. Turkle describes comparable effects in students, whose identities seem to split into the various windows active on their desktop, whereby real life (“RL”) is nothing but one option of the self (1996); and T. L. Taylor traces criss-crossing offline and online family bands in the world of *Everquest* (2006, 55).

We cannot simplify in a formula that “more inhabitants means more place,” but through its variety a vibrant online community provides the possibility for multilayered “social meaning,” which has been identified as a key element for placeness in multiuser worlds (Harrison and Dourish 1996). Findings that the sheer number of players present through their user-avatars seems to be a criterion for a vibrant world (Donath 1997; Taylor 2002; Matsuda, Miyake, and Kawai 2002) support the view that (mediated) human presence turns mere virtual space into more characterized places. Much has been written about—and addressed in a far more specific way than possible here—the social communities that evolve from these worlds (see, e.g., Morningstar and Farmer 1991; Dibbell 1999; Schroeder 2002; T. L. Taylor 2006). The argument, here, is that these kind of social networks feed back into the virtual locations in which they are practiced and situated.

The element of place is not limited to multiplayer worlds, either. Single-player game worlds are also inhabited spaces, concentrated entirely on one interactor. A player can still create a personal identity in them. Games can evoke places through narrative elements, which invite players to form a unique identity and project the necessary meaning into the game space.

Deus Ex is a game played entirely in a first-person point of view with the player controlling JC Denton, a bioengineered superhuman on the quest to uncover a worldwide conspiracy. The keys to the first-person presentation are the numerous cutscenes in which the player and the hero often face snippets of a larger philosophical discussion. This discussion aims to encourage a player to define a personal stand toward the game world. At the ending of *Deus Ex* the player finally has to decide the future of this virtual environment. As the main antagonist, a virtual AI character named Helios states: “We are our choices.” Apart from the obvious philosophical implications, this statement also refers directly to the gameness of *Deus Ex*, in which the player gradually connects to the character and the world. The player’s choices not only shape JC Denton, as one can choose between numerous nanotechnological “upgrades” to Denton’s body, but also the whole game world. Morpheus, a separate form of the main antagonistic Helios AI, clarifies the role of the virtual character in one of the cutscenes of *Deus Ex* further:

Morpheus You are a planned organism, the offspring of knowledge and imagination rather than of individuals.

JC Denton I'm engineered. So what? My brother and I suspected as much while we were growing up.

Morpheus You are carefully watched by many people. The unplanned organism is a question asked by nature and answered by death. You are another kind of question with another kind of answer.

JC Denton Are you programmed to invent riddles?

Indeed, Morpheus is programmed to invent riddles for the players in order to bind them to the game universe in which the question is answered through interaction. These riddles, as seen in the preceding excerpt, can ask the player about the nature of the main character. They can transcend into questioning the play space and include references to the relationship of player and avatar/“planned organism.” In both single- and multiplayer environments, the player's experience is a unique one filled with personal qualities that get assigned to the virtual.

Because video game worlds provide operational spaces that encourage players to engage them, find their own identity in relation to them, change and customize them, and develop a history with them, the question of a player's identity in relation to the game world and its placeness are directly interconnected. As in the physical realm, the question of place is a question of identity. And as in the physical world, actions are shaping forces for both of them.

12.2 Shared Actions and Goals

A player's actions do not necessarily conform to the designer's intentions for the game space. In fact, the more complex the game world becomes, the less a designer can predict the unfolding activity (see, e.g., Morningstar and Farmer 1991). This loss of control does not contradict the process of generating a place. On the contrary, rich game worlds can provide for evolving cultural behaviors in order to grow into self-contained virtual places. They do not depend on carefully prearranged dilemmas like the one in the Morpheus scene, but on the evolving transgressive or emergent play performed by the players.

The Dogtown area in West Los Angeles was not intended by its architects to turn into the Mecca of the skateboarding community. However, it gained a new cultural significance through this unexpected use. Its spatial structure was reclaimed in new ways by the skaters and its function remodeled.

Streets, curbs, benches, and handrails changed their functionality, and the skater introduced an unexpected new layer of meaning to the space through innovative and unexpected use. Other examples include street running and graffiti. The same can happen in virtual worlds. A virtual bridge in Vana'diel, the world of the massively multiplayer online world of *Final Fantasy XI* (Ishii 2002) can turn into a significant spot because players decide to leave their characters there when inactive. Not intended for that use, the location gains a new function, meaning, and value through the player's behavior.

In these cases, it does not matter whether players fulfill the designer's expectations or behave as nonconformists; their activity shapes the space in both cases. Player action in game spaces infuses them with new meaning. Because engagement with space is at the heart of this new use, this meaning can allow for a higher quality of placeness in these environments. This engagement can feed a player-infused circle of cultural production as Matsuda, Miyake, and Kawai argue: "User-created culture can become new content in the virtual world and also attract other new users" (2002, 17). The goal becomes to create a self-sustaining virtual society that is based in the virtual



Figure 12.1 *Final Fantasy XI*; section of the virtual city Jueno with inactive player-avatars

world. The formation of societies and interdependent activities to form larger cultural scenarios is a core concept of a number of online worlds, including *A Tale in the Desert* (Yelon and Tepper 2003) and *Second Life*.

Another reflection of that phenomenon can be found in the way that established cultural events transcend into online game spaces. For example, players staged virtual dance events in parallel to the real-world *Bon* dance festival in the *PAW²* project. The event was entirely player-organized and coincided with the traditional Japanese time for that festival. Christmas celebrations are staged in *World of Warcraft* and Easter egg hunts are held in *Everquest*. Reports on marriages as well as divorces are legion in worlds such as *Second Life* or *Ultima Online*. The significance of the digital community can become so strong that real-world events are organized, such as meetings or conventions, where the cultural traditions established online can spill into the physical world (e.g., T. L. Taylor 2006). The shared practices of the virtual place that shaped individual as well as communal identity enter the physical world in these real-world guild meetings and themed conventions.

Player-defined actions like these are self-motivated and self-organized, and thus relate to essential interaction with space as outlined by Norberg-Schulz. Adapted from Heidegger, Norberg-Schulz's main relations between inhabited and uninhabited space can be interpreted as different kinds of interaction of players relating to the virtual space. They map out the process of turning the space into a place. These actions signify how players make a virtual space more *precise*. They can *complement* it, so that virtual space might *symbolize* some cultural object. As outlined earlier, we can add *creation* and *destruction* of virtual space to these three.

Building a structure, adding to a landscape or changing it, are dramatic functions in titles such as *SimCity* and *Age of Mythology* as well as in *Ultima Online* or *Second Life*. Players make the space more precise for a certain interactive situation when they decide what to build and where to build it. This is the case for successful power management in *SimCity* as well as for the strategic preparation for an enemy onslaught in *StarCraft*. It also indicates a way to complement the existing space. Players opening a new shop in a certain area of *Second Life* or establishing a tavern in *Ultima Online* imagine the selected spot to be a good one for the specific enterprise. For them it seems to fill a gap in the predesigned game world that needs addressing.

The use of virtual space to symbolize some shared connotation points back to the plane of the social space and a growing history of a game space. Shared social practice—of multiple users as well as single ones—can infuse such qualities into the game world. If it becomes a shared practice to meet at a

certain location in the game world, chances are that somebody will build a gathering space at this meeting. In that way, the entrance world of *Alpha-Worlds* grows into the virtual doorway to spaces beyond, or spatial practice might raise one virtual tavern in *Ultima Online* to fame while another—with exactly the same defining variables—remains insignificant. Bing Gordon, chief creative officer at Electronic Arts, argued at the 2006 Living Game Worlds symposium at Georgia Tech that *Ultima Online* provides an outdated game engine, yet “350,000 didn’t want to leave Ultima Online only because of the houses they owned in there.”

Likewise, a location in a single-player game can become a valued place when it manages to trigger a projection of cultural references into it. These differ from player to player, but examples might be found again in the game world of *Deus Ex*, where the player starts the adventure on Liberty Island in the pedestal of a ruin of the Statue of Liberty—a spatial representation of a world in turmoil. An even more critical pointer is found in Liberty City, the simulated virtual city of *Grand Theft Auto III*, which does not recreate any existing real location but references a mixture of urban patterns to create the “worst place on earth.” Yet one is encouraged to buy virtual real estate in this world, utilize the restaurants, gyms, clothing shops, hideouts, and numerous other locations. These connotations are preimplanted by designers but can be embraced by players as they make these spaces their own. They inhabit and conquer the space gradually through their personal actions, following their own goals, forming a place from the provided polygon structures.

12.3 Machinima as Memory

One indicator for this assignment of significance to any space and action are the memories bound to the place and the event. Reflections of memory manifest in numerous forms: as posts on community message boards; as stories told on personal websites or official game publications; as screenshots, comic strips, or—more recently—as moving images in the form of Machinima.

These formats quote traditional media: short stories, visual art, photography, and short films, among others, each with their own tradition and structure. At the same time, they offer glimpses into those shared cultural moments that evolve during play. They are indicators showing how players picked up certain evocative narrative elements provided by the game world and made sense of them within the game world. Machinima stands out among these retellings as it uses the moving image to present the narrative. Generally, Machinima is described as filmmaking with a video game. The game itself becomes a production studio and the game world a virtual film set.

The term “Machinima” is a combination of “machine” and “cinema.” Originally suggested as “machinema” by Anthony Bailey in 1998, the term was accidentally misspelled and wildly publicized as “machinima” by Hugh Hancock, head of the Machinima production group Strange Company and editor of the Machinima web portal machinima.com from its launch in 2001 until 2006. Various definitions of Machinima have been introduced with slightly different emphases on the main ingredients: real-time virtual worlds, animation, interaction, and cinematic visualization (see, e.g., Hanson 2004, 60; Kelland, Morris, and Lloyd 2005, 10; Salen 2002, 99; Marino 2004, 3). But the format is still flexible and evolving. As long as no balance between the different poles is established, it is less helpful to approach Machinima as a new media format. Instead, it remains a production and playback technique that can shift between different final states such as theater, animation, game, and cinema. Machinima can lead to a range of different results but usually shows some connection to the game world from which it derives.

Because Machinima is generated predominantly from within video game worlds and is still in most cases produced by players, it provides a good indicator for their interpretation of the game world. It is often connected to the technological as well as the cultural universe of its underlying game engine. Especially in the form of pure in-game Machinima, which records events as they unfold during the gameplay, Machinima reflects the mediated space as seen by the player and generated by the rule-driven world of the game engine. This mediated plane is still different from a player’s fictional space and the memories themselves, but it indicates the significance of those in-game elements that were selected for the recording and how a player’s actions relate to them.

Like most cinematic forms, Machinima is a conscious selection of elements by its producer. In that way, the piece provides indications for a player’s perceived meaning of a game space in a certain situation. Not surprisingly, we see Machinima used to document social events such as online marriages, protests, or art events in virtual worlds. For example, Natural Selection Studios is a Machinima production studio for events in the online world of *Second Life* that specialized in personal and business-related videos.

A Day at the Ironforge Bank (aka *Ironforge Bankers* [Daddar 2005]) sees Daddar, a skilled *World of Warcraft* player with a highly specialized character, killing the guards of the Ironforge bank, a prominent location in the virtual game world of *World of Warcraft*. He recorded his actions via a live screen capture, edited them, added a soundtrack, and released the result as a Machinima piece that became immensely popular in the community. The virtual bank robbery has no impact on the game world, guards and bank

accountants will respawn, no game quest can be completed, and no virtual money is gained. It was an entirely player-driven-and-motivated action that stages the bank as a meaningful target of a heist. Instead of an in-game bonus, Daddar received a boost in the social metagame and his robbery became legendary in the player community.

A Day at the Ironforge Bank is a short video film and not a game. On the one hand, it features traditional cinematic techniques that reference established visual storytelling traditions to dramatize the presentation (Nitsche 2007a). On the other hand, it also exemplifies the significance attributed to the virtual space. The Ironforge bank is worth looting—even if no in-game bonus can be gained—because of the cultural significance of the space and its relevance for the player community. Many other players share the same understanding of this virtual cultural space. That is why Daddar's performance was widely recognized as an amazing stunt—one that inspired players to model their virtual characters after his. The Machinima stands out as a documentation of his heroic undertaking and helps to imprint it onto a shared memory that, in turn, can grow those virtual social spaces. As long as the story is told and remembered, the bank in Ironforge is the one that Daddar attacked. The functional space of the virtual bank becomes a cultural connotation because a story is associated with it. The Machinima, thus, indicates a new placeness for this location.

These forms of Machinima are traces of memories of events in the virtual world formed into traditional storylines. They mirror the growing significance of games and gaming as cultural practices. Game places grow with the emerging history of the virtual spaces that help to reference and localize the interconnected memories of a player community.

A number of real-world cultural practices transcended into game worlds as described earlier. Likewise, Machinima has been used to reenact historical events from the physical world. One example is the *Paul Smith Battle* (n.n. 2005) that uses the game engine of *America's Army* to restage the fight that led to the death and posthumous Medal of Honor awarded to Sgt. Paul R. Smith. The game engine of *Rome: Total War* has been used in TV series like *Time Commanders* (BBC/Lion Television 2003) or *Decisive Battles* (History Channel 2004) to reenact historic battles and their strategies. At the same time, Machinima can be used for more personal and highly individual memories such as bladeninja's *A Tear Drop* (2005), addressing the suicide of a family member. Or it can serve political statements as seen in the widely discussed *The French Democracy* (Chan 2005), which provides a perspective on the Paris riots of 2005 generated entirely in a game engine. Games and game platforms become expressive vehicles for “real” cultural issues. Finally, Machinima can

mirror the significance of the virtual space as a hybrid of real/historic and fictional/virtual. When Jim Munroe takes a walk on the streets of Liberty City in *My Trip to Liberty City* (Munroe 2003), he describes his journey as a real-world experience of a virtual space. He blends typical tourist behavior and fictional cityscape by taking the game world seriously.

Placeness is not a quality of a virtual space per se, but one that can be achieved for it through the inhabitants: the game's players. Virtual placeness has to be earned. The indicators presented here showed that virtual places can be traced in the changing character identity, self-motivated goals and actions, and memory recollection of localized game world events.

A final caveat: not all games depend or support such a placeness. Few players will experience the labyrinth of *Pac-Man* as a place with its own genius loci. The original *Pac-Man* barely supports any of the aforementioned signs of place creation. Likewise, players do not have to embrace a new identity in *Tetris* but stay "outside" to beat the game they face. It is also difficult to form creative new goals in the given universe because of the relatively limited interactive range at hand. *Pac-Man* features cutscene intermissions, but most Machinima created from it is repetitive or purely strategic. The single-screen predefined viewpoint does not allow for more elaborate camera work. The game world remains spatial but lacks the quality of a place. That does not devalue the game, but it does decrease the spatial and place-like significance that the game world can achieve for the player.

Players “in” the Video Game Space

If there is one central question that derives from the creation of virtual places, then it has to be that of the role of the player in relation to them. The notion of “identity” was introduced through architectural theory but has been debated in virtual worlds for some time. Sections 13.1 and 13.2 will look at the player’s position in a meaningful game space. They will consider the question of presence in game worlds. What is the player’s position in relation to these environments? A core argument here is that the player is a performer but can participate in the game world in more than one role. This allows for a multifaceted exploration of the virtual world and the game’s setting.

13.1 Forms of Presence

Presence, in the context of this investigation, is understood as the mental state where a user subjectively feels present within a video game space as the result of an immersion into the content of the fictional world (in reference to Slater 1999, 3). It is a mental phenomenon based on a perceptual illusion.

A number of researchers have concentrated on the idea that a state of presence should be connected to the illusion of a nonmediated experience (Lombard and Ditton 1997). In this case, players do not see the interface any more because they feel present in the world beyond the screen. How this is achieved and how the effect might be measured are somewhat unclear. On the one hand, correlation between high presence and physical reaction to the virtual environment has been proven in experiments. For example, acrophobes might experience fear of virtual heights (Hodges et al. 1995) or flight simulators can generate a feeling of motion sickness. Psychological therapy has embraced this

new direction, for example in virtual reality exposure therapy that confronts patients with virtual presentations of their feared conditions. In fact, every day on the very real commute to Georgia Tech, I drive past the Virtually Better offices in Atlanta that offer virtual therapeutic sessions, for example to treat the fear of flying (Rothbaum et al. 2006). This particular fear can also be addressed in real-life staging using a real airplane. The latter might be more expensive but would still provide the necessary conditions. In other cases, certain fear conditions cannot be recreated so easily in reality. In a single case study, Difede and Hoffmann (2002) describe the successful use of VR technology to address a post-traumatic stress disorder in a witness and victim of the September 11 attacks. The VR recreation in this case included different sequences that depicted fragments of the disaster. They were of varying levels of detail in their presentation, starting from a simple model presentation without sounds, then one without explosion, up to a full sequence that depicted the disaster with all presentational means available.

In order to work, these virtual environments have to evoke some fear in the user and presence seems to support this effect (Schuemie and Krijn 2005). The effect of presence seems to work but the findings about *how* presence works are not yet conclusive. Like “interactivity” the term “presence” is central to virtual environments—but still open for debate. Although there have been various attempts to measure the level of presence, so far no definite way has been established. Zeltzer introduced the importance of input and output for the emergence of presence (1992), but the debate over the concept of measuring presence as such is still unresolved (see, for example, the discrepancies between Witmer and Singer 1998 and Slater 1999).

From the vantage point of game spaces, we can argue that the activity and engagements in all five analytical planes, from rule-based to social, support presence. More precisely, the interconnections and interdependencies among them foster presence. To clarify: not every game immerses the player in a virtual 3D space. Some games reduce their spatiality and players get immersed not in the game world but in the playing of the game itself. This does not necessarily affect the level of immersion as the growing references from game studies to the effects of “flow” indicate. Flow has been introduced as a state in which a person is fully immersed in an action and highly focused to the extent that one can experience, for example, a loss in the feeling of self-consciousness and time experience (Csikszentmihalyi 1991). A player who reaches this level is clearly immersed in the game but not necessarily “present” in the virtual space. Flow is action dependent. The player has to concentrate on a specific activity. Presence has been traced to levels of interactivity, but is less task-oriented and more often discussed in terms of presentation.

Video game spaces cannot be dissected into either domain. A player only perceiving a virtual space lacks too much of the necessary interactive engagement and hardly differs from a cinema audience. At the same time, a player only interacting without reading the space is following sheer actionism and limits the flexibility of the event space. The textual process of the game is interrupted or at least complicated. At times, the action becomes so automatic and part of the player's memory that spatial references diminish. During my stay at Sony Cambridge, myths circulated of a game tester who could play a newer version of the classic video game *Frogger* with his back to the screen because he somehow memorized the pattern of the repetitive game. He had been testing this title too long and the fixated world of the frog had left its impact. These are exceptions where players have "grokked" the game until their fictional plane has reached the rule-based plane. Most players do not reach this level and their immersion depends more on the level of the fictional plane.

Both presence and flow support each other in video game practice (Takatalo 2002). The initial focus here will remain on presence but, as will be clear in the examples below, actions remain important elements in the generation of this player experience of presence on all levels.

A number of models to discuss presence have been suggested, like the six conceptualizations of presence as described in Lombard and Ditton (1997), and various practical investigations have led to further and more detailed models (e.g., Takatalo et al. 2006). For game spaces a helpful and basic approach can be adopted from Heeter, who distinguishes between three different forms of presence in virtual worlds:

- *personal presence* "the extent to which and reasons why you feel like you are in a virtual world";
- *social presence* "the extent to which other beings (living or synthetic) also exist in the world and appear to react to you"; and
- *environmental presence* "the extent to which the environment itself appears to know that you are there and to react to you" (1992, 2).

How do game worlds evoke these elevated levels of presence on the different planes outlined by Heeter?

The value of narrative elements for "personal presence" becomes obvious when comparing the use of interactive computer-aided design walk-throughs through virtual buildings with 3D video games. In the field of architecture, the walk-through simulations aim to give the audience a "feel" for their upcoming home/working space/leisure area, but they rarely offer any active

engagement with the virtual world. These simulations provide a limited moment of presence through their low level of functionality. Many architectural representations end up as linear movie clips of prerendered camera fly-throughs through the virtual world and even lack the interactive feature of navigation or locomotion, which has been identified as one factor to provide higher levels of presence (Schuemie and Krijn 2005).

Through their increased graphical sophistication, reliability, and accessibility, game engines have become relevant for architectural design and representation (see, e.g., Richens and Trinder 1999; Shiratuddin and Thabet 2002; Richens and Nitsche 2005), as well as for architectural reconstructions of historic sites (see e.g., Gaitatzes, Christopoulos, and Roussou 2001; Addison 2001; Champion 2003). Game levels can serve as references to physical structures. Environments such as the *VRND Notre-Dame Cathedral* (DeLeon and Gibbs 1999) using the *Unreal* engine or *München 4D* (n.n. 2002) using the *Virtools* engine claim to deliver accurate reproductions of their physical references. However, their interactive access to the virtual surroundings remains limited to exploration, to a virtual promenade as outlined in section 6.2. These worlds lack any elaborate functionality but allow the visitor to navigate the virtual world freely and the architectural walk-through becomes more of each player's own exploration. However, except for their footsteps, players barely touch the surrounding space. They are allowed to look but not to play with the game space. They remain visitor with little chance to inhabit, occupy, or affect the virtual space. All these fundamental techniques to increase the placeness of a digital world remain unexplored, and the experience turns more into a visit that is not supposed to leave any imprint. Not surprisingly, this approach was also used in real estate, for example by Miliano (1999), who used the *Unreal* engine to stage interactive walk-throughs through real property for sale. You can visit a game space for possible future acquisition of the real space, but you may not leave any trace in the home you visited.

Neither the visuals nor the sound design are dramatized to the same extent they are in games or films to deliver an engaging experience. Instead, they deliver a plain depiction of the virtual structures that aims to somehow simulate historic or "real" spaces. This reference to the real is a key element of their value and design. In contrast to this approach, video games can evoke drama and stimulate the player to have a satisfying experience with little or no reference to real physical buildings. Game worlds such as the ones in *Rez*, *Super Mario 64*, or *Final Fantasy X* have no ambition to depict architecture that can be reproduced in the real world but to give the player the feeling of personal presence in the dramatic fictional world these games create. They engage the player in very detailed activities with all kinds of elements in the game world,

increase their access over time and thus encourage further interaction, and constantly reward the player. They engage the player with the virtual world instead of hoping to achieve this effect later through physical implementation of the structures presented.

Referring back to the experiment with acrophobes and virtual reality exposure therapy, it becomes clear that a situation has to be dramatized in order to improve its impact. When testing a virtual environment's efficiency with the acrophobes, the specific dramatic involvement (the growing fear with growing height) was provided by the special condition of the group of participants (all acrophobic or with acrophobic tendencies) (Hodges et al. 1995). To evoke a comparably dramatic effect of threatening height in a group of non-acrophobes, one has to dramatize the situation and the role of the player within it through special functionality and presentation. In order to provide the acrophobic effect to non-acrophobes, Hitchcock used complex sound and camera work in *Vertigo* (1958) that consisted of a careful combination of camera movement and zooms to create a feeling of vertigo through the distortion of the space represented. Likewise, game worlds have to apply effective presentation to provide for comparably effective dramatization, and a number of possible approaches have been outlined in part II, especially in chapter 7. At the same time, the game worlds have to incorporate interactive access. It is not enough to experience the vertigo effect visually; the player wants to be able to dive into the space and engage with it. So, as outlined, the relationship has to be an active one to improve presence. *Superman Returns* (Peters 2006) allows players to rush through the virtual Metropolis. This rush is dramatized by additional visual stimuli as the picture references the visual phenomenon of tunnel vision to emphasize the speed effect. These elements support immersion, but are based on spatial design, reading, and practice transcending various analytical planes. Rushing through the virtual Metropolis is only one way to increase the player's engagement with the world. All other elements of functionality and presentation have to connect to improve players' immersion. In combination they provide for higher personal presence that activates and connects the five analytical planes of game space. It is in this combination that game spaces increase the level of presence in the environment.

"Social presence" can be best traced in multiuser worlds. In these game environments players constantly share locations with each other. The feeling of "copresence, a sense of 'being there together'" (Schroeder 2002, 4) can support their immersion. Notes T. L. Taylor, "In multi-user worlds, the power of embodied presence is also quite often directly tied to a *practice* of presence as a social activity. In this formulation, the inscription of self on the space becomes a socially mediated experience. Through action, communication, and

being in relation to others, users come to find themselves 'there'. It is through placing one's avatar in the social setting, having a self mirrored, as well as mirroring back, that one's presence becomes grounded" (2002, 44).

One creates the avatar and the avatar's persona not only for the other players but also for oneself (see also Stone 1998; McMahan 2003). Games allow for "countless ways of shape-shifting" (Murray 1997, 154), which introduce Murray's key pleasure of transformation to game worlds. Questions of role and identity overlap as players transform themselves through this projection onto a virtual character.

In single-player environments non-player characters can feed this projection by addressing the player directly as the fictional character, as seen in *Half-Life 2*. The player enters a role in relation to other beings in the game space and is immersed further through the development of this role and his or her embracing of these developments. Evocative narrative elements to support the characters also strengthen a form of social presence in single-player titles. These means can include forms of interaction (such as co-op play, or player vs. player play, or methods of player communication) as well as spatial design (such as public vs. private spaces) to support the social plane and to increase social presence in game titles.

"Environmental presence" can be traced in the reactions of a virtual space to a user's interactions. This is part of the interface abstraction in game spaces and includes architectural elements like opening doors or windows that seem to react to the player in the world. Other examples include a trace of the user-avatar's virtual footsteps or the shadow the user-avatar casts in the fictional world. Again, the connection of presentation and interaction is the most interesting one in these examples. Champion, for example, argues for a "virtual heritage" that consists of a change in the place in relation to user activities (2003). Here, the interactor literally leaves some form of trace in the environment, which is used by Champion to enhance navigation. Any such trace is an example of environmental presence and provides for a contextualization of virtual space. The strategy game *Myth: The Fallen Lords* (J. Jones 1997) uses a gradually changing ground texture onto which players literally inscribe their paths. The playground fills up with signs of maneuvers and bloodstains of past battles over the course of a game round.

Inscribing one's action into the game space visually emphasizes the connection between the game world and the inhabitants. While *Myth: The Fallen Lords* automatically adjusts the space and adds the tracks and traces in the game world, other titles make these inscriptions part of the conscious game-play mechanics. *Counter-Strike* offers the option to spray a virtual graffiti on the game walls to leave a personalized image in the space. The option became

a form of self-expression in the game world embraced by artists and activists such as Anne-Marie Schleiner. Her *Velvet-Strike* project (Schleiner 2002) provided players with certain kinds of prefabricated graffiti tags that can be spread in the *Counter-Strike* world but that are inspired by Schleiner's antiwar position. The game space turns into a canvas for the self-expression of the player-artist.

On the level of personal, social, and environmental presence, space and its presentation ultimately situate interactors into special contexts. Players are positioned as Heeter's model is realized on all levels. What, then, is the resulting player positioning in relation to the fictional world?

13.2 Player Positioning

It is not only the space that has to adjust to support player engagement. The player changes, too. Poole claims that: "In the cinema, the world is projected *at* you; in a videogame, you are projected *into* the world" (2000, 98; italics in original).

But this direct projection lacks awareness of the player's "transformation"—one's dramatic positioning in relation to the world. "You" are not directly projected into the fictional world of a video game space. Instead, you get access to distinct elements (e.g., an avatar) within it and from that a feeling of presence can emerge. This chapter will look into this access through positioning, not only on the level of the mediated plane but also for the rule-based, fictional, and social ones.

13.2.1 No Role

There are forms that seemingly let the player participate in the game as "you" as they hide the fourth wall of classic theatrical productions and immerse the player in the game world. In Alternate Reality Games (ARG), players follow hidden clues through a complex network knitted from any available data from webpages, telephone calls, Global Positioning System, film trailers, and other media sources.

Under the credo "This Is Not a Game," ARGs blend the players' play space with the rule-based and fictional spaces. In games such as *The Beast* (Lee 2001), players find themselves searching for fictional clues in real as well as virtual locations, from public bathrooms in Chicago to an extensive network of fabricated websites. *The Beast* originated as a publicity game for the release of Spielberg's *A.I. Artificial Intelligence* (2001) and consisted of a complex network of puzzles and relations, mysteries, and fictional institutions created by the game designers—called puppet masters. To solve the intricate puzzles, players

had to collaborate in large groups, forming a highly efficient social space. They hacked into websites and collected and combined fragments of information to solve the set mystery.

The blurring of the “real” with the “game” results in a shift of perception when individuals get so involved in the game that any distinguishing between game and nongame becomes difficult. Some players of *The Beast* blurred the demarcation line of the “magic circle” that describes the play space. They discussed the application of their grown framework for real-life problems such as solving the mystery of the September 11 attacks or U.S. government issues (McGonigal 2003b). In these cases, the layer of the social space has built up its own rules and systems. They become so dominant and vivid that these player-driven networks seem to look for new play spaces to reapply their rule systems.

A rule-based plane seems to invade and overlay one’s everyday real world and the definition of the play space becomes difficult as the dividing fourth wall disintegrates. Alternate Reality Games form pervasive gaming worlds in which players do not have to identify with a fictional actor, but can act as themselves in fictional settings. McGonigal (2003a) argues that players are capable of clearly identifying which action belongs to which realm, and that their immersion grows from a directed longing to believe, which is a conscious effort and would provide a clear distinction. She might be right, and the game events and spaces in Alternate Reality Gaming might be more clearly defined than its own “This Is Not A Game” credo suggests. However, any repositioning of the player as actor without restricting the new role is blurring the borderlines in the player’s performance. The playground might be marked (more or less clearly), but the role remains without such a demarcation line. ARGs are not following the same limitations of role-playing games but have elements of hidden theater where everyday life and performance blend.

According to Elan Lee, ARG designer, “If you look at a typical video game, it’s really about turning you into a hero; a super hero, a secret agent. It’s your ability to step outside your life and be someone else. An ARG [= Alternate Reality Game] takes those same sensibilities and applies them to your actual life. It says, what if you actually were a super hero, what if you actually were a secret agent? Instead of living in the box that’s your television or your computer, why not use your actual life as a storytelling delivery platform?” (see Ruberg 2006).

As much as “This Is Not A Game” is a tongue-in-cheek battle cry of ARG designers, it still highlights the diffusion of what is game and what is not, when a person is playing and when not.

Another special case is the Cave Automatic Virtual Environment (CAVE). CAVEs consist of a closed box in which the interactor stands, surrounded by rear-projected stereoscopic images that create the illusion of a seamless virtual space. The body is enclosed in space “in front” of screens. In fact, one does not see any space except the virtual playground and one’s own physical self. In the CAVE at Duke University I found myself playing a new version of *Pong*—not the original tabletop arcade machine, or the home console version using the television as projection screen. In this fully immersive 3D *Pong* I stood in the middle of a cross-shaped platform floating in space, holding a virtual wire-frame paddle attached to the controller in my hand. With this virtual paddle I hit back balls rolling toward me from all four sides. The setup brought back fond memories of the grid in *Tron*. Like Kevin Flynn (played by Jeff Bridges) who stepped onto the grid of his own program in Lisberger’s *Tron*, I (playing myself) stepped into the grid of the *Pong* world. No avatar is needed—no body but mine. But unlike the Alternate Reality Games, the CAVE has demarcation lines through its mediated nature. I can bump against the projection walls. When I started jumping, a scared operator rushed in to say that they were not so sure about the weight that the floor projection plane could carry. Too much body at the wrong spot and I might fall through the mediating plane into the projection room below. The CAVE cubicle is a spatially defined virtual stage for one performer. When I left the cubicle I left *Pong* behind with it. This is not necessarily the case in ARGs where the whole world can become a playground because the media applied are unrestricted and my role is not defined.

This is rarely the case in the video game spaces that form the core discussed here. Players navigate them usually through some form of virtual representation, for example an avatar. They always generate a certain relation to the world through the mediating plane, for example, as generals looking down onto the virtual battleground. This provides a structured point of access for participation in a video game. Users can feel present in the fictional world through such dramatic positioning, but they are not embodied in this world themselves. They cannot crash through the projection plane nor do they dissolve the mediating demarcation line of the computer as media. What, then, is the user positioning in a video game space?

13.2.2 Actors of One Role

Due to the given technical limitations, early analyses of player positioning mostly related to text performances, such as text chat (Wunderer 1999; Reid 1991) or MUD titles (Laurel 1993). Often these works envision future spatial possibilities from the limited text-centric pieces at hand. Murray (1997), for

example, addresses the break through the fourth wall practically by referring to MUDs, among other technology, and develops it with reference to highly (hyper)mediated future VR worlds such as the model of the Holodeck as introduced in the TV series *Star Trek: The Next Generation*. The Holodeck is a kind of science-fiction CAVE that strips out the boundaries of the mediating projection planes. Thanks to some future technology, the space extends indefinitely. Neither can I break through the ground projection plane, nor bump into the siding projection walls. This form has not yet materialized. What emerged instead is a widespread 3D spatiality of video games that is not experienced as a Holodeck vision but as a world of polygons presented via a mediated plane. This world is limited in its appearance and functionality and those factors shape the player's positioning.

The functionality of interactive digital media positions the player as a creative performing element inside the spatially located discourse. But this transformation is still defined by the mediating plane that allows it. The presentation through cinematic means allows the user to step into the spatial world of the action itself through the filtering eyes of the virtual camera. In doing so, interactors adapt to the dramatic positioning and step into a dramatic role in relation to the game space.

Black and White (Molyneux et al. 2001) translates concepts of sacred virtual spaces into a 3D video game world to support the player's dramatic role. In the world of *Black and White*, the user is positioned as an invisible god-creature worshipped by the virtual beings living on various islands spread in a seemingly endless ocean. Norberg-Schulz emphasizes the position of a real island as "a place par excellence, appearing as an 'isolated', clearly defined figure" (1980, 39). *Black and White* embraces this idea of isolated land formations. Spatially, these virtual islands are conceptual counterparts to the amorphous play space of Alternate Reality Games. On these islands, pillars of light indicate points of special interest.

Visually, these lights relate to Ching's principles of *axis* and *hierarchy*. In the setting of the game they represent a virtual axis mundi—the vertical connection between heaven and earth in the fictional world (see, e.g., Eliade 1987, 33–36). Consequently they support the player positioning as "god" as they reach up toward the heavens where the camera has positioned the player. Starting from its introductory cutscene, *Black and White* establishes a hierarchical relationship between the virtual god (the player, hovering high above the game world) and commoners (AI-driven virtual inhabitants of the world below). The light axes between them connect both in a symbolic and visual way that supports a stronger player positioning in this one role.



Figure 13.1 *Black and White*: lights assisting orientation and positioning.

But their value goes beyond a simple visual reinforcement of the player's positioning. Eliade offers the notion of a meaningful position—a mark—set by its sacred meaning: “The manifestation of the sacred ontologically founds the world. In the homogenous and infinite expanse, in which no point of reference is possible and hence no *orientation* can be established, the hierophany reveals an absolute fixed point, a center” (ibid., 21; italics in original). Techniques of orientation, therefore, Eliade sees as “techniques for the *construction* of sacred space” (ibid., 29; italics in original). The pillars of light in *Black and White* play with this notion. One way to create more light beams is for the virtual inhabitants of each island worlds to build temples for their gods (the player). These temples generate strong light beams that offer clear points of orientation. The better the player manages the game space and its inhabitants, the more followers the player has, the more temples will be built, and the easier it becomes to navigate. Eliade argues that these structures assist the orientation of the commoner—he is the one who generates such a landmark to establish the relation to the world. In *Black and White* the roles are reversed, as the player-gods need guidance through the digital world. It might be the

tasks of peasants and followers to build the temples, but it is the player-god who gains from the improved orientation.

In addition, smaller lights indicate unresolved tasks or reward options. These light beams not only provide help for spatial orientation, but they also indicate past and future activities. Because they offer entry points to subquests and reward points for successful interaction, they inscribe traces of a history onto the fictional world of *Black and White*. The resulting network contributes to the narrative and dramatic setting as well as the different layers of presence as outlined in the last chapter. It weaves the player into the position of the “god” applying any means available.

Being a god is a valid and widespread player role, but it certainly is only one among many possible forms of player positioning. During a panel at a film festival in New York I was seated on a stage next to other panelists on one side and a live rendered “Master Chief” on the other. The Master Chief is the virtual hero from the very successful video game series *Halo* and millions of players have slipped into this role while playing the first-person shooter game. In this case, the Master Chief was not here to fight but to talk. The character was the virtual alter ego of Chris Burke of the Machinima talk show *This Spartan Life*. Burke himself operated him live from a desk offstage. Instead of feeling out of place or between two worlds, the whole setup was quickly accepted by the panelists and the audience. It felt rather normal to be surrounded by natural and virtual panelists. In fact, it was more confusing to see the real Chris Burke hiding behind the curtain with his Xbox controller and voice headset and navigating the *Halo* commander.

Like me, most of the people in the audience had either seen or controlled the Master Chief themselves. We had already some form of personal relationship with him. He had already been our representation in the virtual world before. Because he had been our role, we had no problems in addressing him as a valid face of the hidden Burke. He fit right in on a panel filled with other participants from very real institutions such as MIT, Georgia Tech, and MTV. With growing literacy our reservations against virtual characters fade. We took this virtual character seriously when he provided expert opinion on video game cultures.

Chris Burke played the Master Chief on an Xbox console taking on the character, his perspective, and range of action. This fulfills claims of cyberspace researchers as stated in the early work of Laurel: any user should play a single virtual role. She originally compared a player to an actor playing a dedicated role on the virtual stage. This should be experienced in a first-person visualization (Laurel 1986)—a dictum followed by many VR research projects. Other projects offer variations of this basic demand. The *Acting in VR*

project at University College London offered virtual rehearsals in a first-person point of view (Slater et al. 2000). These virtual performances were intended to prepare actors for later performances in the real world. The project addressed problems of acting in such an environment, including the necessary interface that needed constant improvements throughout the project (ibid., 7). The virtual actors in that project had to be able to express emotion through body language and facial expressions. This is no easy feat. Avoiding most of the connected questions about facial animation and subtle body control, *Halo's* Master Chief, for example, hides his face behind a reflecting helmet and his body behind clunky full-body armor. However limited these expressions were, the concept itself seemed to be useful. Engaging the user as actor of one role in the events on the virtual stage is, indeed, a possible dramatic positioning. Countless games such as *Halo* or *Half-Life* have exemplified that. Countless others—like the *Max Payne*, the *Tomb Raider*, the *God of War*, or the *Prince of Persia* series—have shown that the camera does not have to be in a first-person point of view to connect the player to a single virtual role. Playing a game in one role is a valid approach and strong evocative narrative statement, but a single role is not an inherently necessary restriction posed by virtual environments, as one might assume from Laurel.

It takes a trained actor a long time to understand and act out a certain character, usually under the guidance of experienced directors. The *Acting in VR* project had a director specifically included in the team to support this process. The merit of Machinima performers like the ILL Clan or Burke rests within their abilities to deliver engaging improvised performances in virtual spaces. Their success grows from their expertise as virtual performers. Many virtual performers, like the members of the ILL Clan, have a background in theater and have developed their technique over the years. It is not only the mastering of the game space and the interface that makes them stand out as actors, it is also their basic understanding of acting as such, their sense of timing, fluent teamwork, and understanding of drama. Like traditional improvisational players, they are capable of switching roles and playing multiple characters. They step behind the idea of the “single role.” As in the world of real theater it can take a virtual performer a lot of time and practice to develop the necessary expertise.

Game players rarely want to wait this long in order to use game spaces. However, game players usually have neither a fixed script before entering a scene, nor a guiding director. It is the system that provides guidance and dramatic role through the interface. For example, the system can offer a choice of stock characters to the interactor as seen in the *Tekken* series on virtual martial arts. Once the choice is made, the interactor is confined to the chosen

user-avatar's limitations and abilities and its restrictions shape the player's access to the virtual world and the evolving discourse. Certain fighters have certain moves and abilities, and it is up to the player to discover and master them in the *Tekken* series. It is, however, up to the designer to make sure that all the different fighters remain balanced against one another in their abilities. Even if all characters are fundamentally based on the same model—as seen in *Counter-Strike*—it remains the designer's tasks to balance and restrict their roles.

If one selects the role of a counter-terrorist in the game *Counter-Strike*, one has to accept the associated demands of this positioning (diffuse bombs, free hostages, defeat terrorists). This shifts the player into a set position in relation to the game space and its ingredients. The shift can be abrupt—as in *Tekken* or *Counter-Strike*—or gradual. In the single-player campaign of *Halo* the player is gradually immersed into the game world. In the first mission, the main character lacks any weapon and is guided by a non-player character through the environment until an enemy attack starts and the player has to show that she has learned the first steps of controlling Master Chief by surviving the first crisis. Learning basic spatial navigation is the first task in this step-by-step shift into the virtual role, not fighting or control of in-game vehicles. Spatial experience and mastering and role creation and acceptance seem to be closely interrelated. The same rings true for *Half-Life*.

We wanted to make sure that Gordon [= Gordon Freeman, virtual hero in *Half-Life*] was a product of his environment and also had an interesting role there that tied into the game play in some way. . . . Gordon is supposed to be a bright young physicist, and the characters assume he is well trained for his tasks; yet the player really doesn't have a clue what to do, and the things they actually spend doing often amount to menial tasks. . . . The most important thing was to give the player a feeling of being constantly off balance, never quite sure of what was expected of them, to give them the task of continually finding this out for themselves. (Marc Laidlaw; see Isbister 2006, 220)

The virtual role of Gordon Freeman is set in a cultural context: he is introduced as a bright physicist and MIT graduate. These role elements are constantly enhanced as the player finds herself “off balance” and has to readjust to the provided role. To engage the player, the game does not ask him to develop a new character—as the *Acting in VR* project did—but to accept a very specific role with all its limitations. Theatrical actors concentrate and develop their wide range of expressive vocabulary in order to give life to a fictional character presented to a paying audience. In contrast, most character options in games work the other way around. They are extreme concentrations

predefined by a designer and an integral part of the fictional world. They are the interactive options delivered by the system and accepted by the user who can experience this pleasure of “transformation” (Murray 1997). Interactors are often allowed to change and customize their character, but principally have to adapt to the limited character options and interactive access offered by the system. These characters often feature few expressions beyond the necessary functions to play the game. They are not equipped for other performances and expression than the one they are optimized for, which complicates the development of new narratives (see also Perlin 2004).

Learning the rules of a game space to fulfill the demands of the game mirrors to some extent the rehearsal process of theater productions. An actor is learning the best possible performance during the rehearsal of a scene—an interactor is learning the best possible (or at least sufficiently effective) performance of a task in a game space. Both do so by repeating it over and over again. While the space of the film set in most narrative films is arranged to support the performance of the actor, the space of the game is shaped to guide the player’s limitations. It can be a friction zone for the character and localize its development. Mastering it is often the first challenge. When I enter the main laboratory in the heart of *Half-Life*’s Black Mesa complex, I am staged in the role of the research assistant Gordon Freeman. I have to conduct an experiment by pushing an unknown artifact into a central chamber. From a certain moment on, the space does not allow any other meaningful action than that. Even the path along which I have to push the cart with the material is clearly defined. Through my successful performance in the given limitations, I acknowledge and accept the proposed role in the game.

A comparable effect is at work when players learn play strategies to optimize their use of the game space in multiplayer game sessions. This kind of performance has aspects of a sport as well as of performance (Lowood 2005). Success here is the total and elegant defeat of the opponent. The more effective and unique a player’s strategy, the more it might be admired, but the task itself does not depend on an expression to be optimized but a strategy to be deployed. The character becomes a game token in this strategy.

Players learn the necessary jump length in *Super Mario 64*, the weapon performance in *Quake II*, or the fighting combos in *Tekken*. Such a task-driven approach does not attempt to express the emotional depth, inner struggle, or feelings of the character. Instead, this kind of problem solving often stays on the level of an athlete, a stuntman, or a chess figurine. These user-avatars perform tasks—they are not optimized to act out complex expressions and interactors cannot develop multifaceted characters as long as they lack the

necessary acting skills and the expressive vocabulary. Within these roles we can often trace cultural frames.

Half-Life's Gordon Freeman and *Halo*'s Master Chief are the independent, individualistic, and often lonely heroes that gain admiration by constantly proving their superiority. Isbister has traced this character back to the American tradition of John Wayne and Clint Eastwood characters. She contrasts them with the group-oriented, supporting, and differently depicted characters of *Final Fantasy X* that mirror traits of Japanese culture (Isbister 2006, 55). The interconnected character networks in role-playing games foreshadow the next section: how a player deals with more than one role in a given game world.

Indeed, Isbister's argument in character differences is shining through in their use of game spaces. The lone hero in the mentioned examples explores and conquers the technology-driven, hostile, often closed spaces of *Half-Life* and *Halo*. The group-oriented characters of *Final Fantasy X* wander through more mystic, slower-paced, colorful exterior landscapes. The differences are also present in the form of presentation: the complete dependency of the first-person shooter on perspective contrasts with RPGs relatively late move into full 3D. In these differences we can mirror Isbister's argument for different culturally grounded characters in the design of the game spaces and the spatial representation, but it is difficult to derive archetypical or visual standards from that without extreme simplification. For example, it was the Japanese game *Super Mario 64* that took the 2D game genre of jump and run and adjusted it to 3D game spaces, proving a possible 2D preferences of Japanese game culture dubious. Other practices show that even streamlined characters like the action hero Master Chief can become stars of long-running narratives.

The Machinima group Rooster Teeth performed all one hundred episodes of their immensely successful video show *Red vs. Blue* in the game environment of *Halo*. One of their main appeals grows from the fact that they project complex personalities in different Master Chief-like warriors, although these characters all look very alike with only differing color schemes. All Master Chiefs originally have the same roles, the same status, the same abilities, and the same mission in this online game. As they question all of this uniformity it is only fitting for Rooster Teeth to start the first episode with a question: "Why are we here?" Rooster Teeth questions the restricted spatial setting of the multiplayer *Halo* world that the avatars inhabit—as well as one's role in that world. The characters are trapped in their assigned roles and inside the simplified fighting arena to perform these roles, the multiplayer game of the *Blood Gulch Canyon*, but Rooster Teeth looks beyond those limitations. A mayor appeal of this very successful Machinima series is the fact that they are

struggling with questions that reach beyond this space and the given role within. “Why are we here?” is one part of the question “Who are we?” and reframes the whole game setting. Over the course of the show, *Red vs. Blue* develops its characters and their relation to a soap-opera-like network.

But given conceptual limitations can make it difficult to develop deep characters from games. Interesting hybrids emerge when this vocabulary is enriched, which brings us back to the role-playing genre. Most online titles allow for avatar customization and player-player communication that add individual touches to a character. An expert role-player in a multiuser world can invest a lot of personal efforts in the development of a coherent character, whose visual expressions remain restricted but are matched by a complex behavior and a growing character’s history. In that way, role-players can develop their expressive repertoire through extensive playing during which they enact the chosen role much like in an ongoing improvisational theater scene. Over time, many of the developed characters gain personal and shared histories.

“Avatar bodies don’t exist in isolation. They exist in context” (T. L. Taylor 2002, 44) and this context is codefined by the spatial conditions of the persistent game space. Enriching this context through a long-lasting consistent behavior can lead to the creation of a meaningful fictional character even though the expressive means of this character are still very limited. As the social plane sinks into the game space, placeness emerges from the virtual environment and changes the quality of the virtual world. The possible handling of that role reaches into the debate on gender roles in virtual worlds (Reid 1996; Stone 1996; Hayles 1996; Morse 1996; Herz 1997; Isbister 2006) and touches on wider social implications in the context of virtual communities (Rheingold 1991; Turkle 1996; Dibbell 1999; T. L. Taylor 2006). All of these effects affect the player’s role in the game space and with it their spatial conditioning.

However, the quality of “acting” and successful character creation is debated even among role players. Koster, designer of the multiuser online worlds *Ultima Online* and *Star Wars Galaxies: An Empire Divided*, posted his “Koster’s law” as follows: “The quality of roleplaying is inversely proportional to the number of people playing” (1999). His “law” implies that the larger a role-playing community becomes, the lower the quality of role playing overall. The consistency of the shared game space and the roles in it become ambiguous as the game cannot make sure that every player stays “in character” in relation to the game space due to the sheer size of the player community. Instead of concentration on the single role and its expression, a different term might offer help to describe the player’s role in this moment: the participant.

Players as participants shape the discourse but not necessarily as “actors” who aim to express a believable dramatic role in a performance. Like readers of a book and viewers of a film, participants in games are capable of changing their position. They might identify with one virtual character for some time, but are not confined to a single perspective and can spread their persona over a number of characters. They participate in the game space, its setting, and action, but remain flexible in the question of the role and perspective in it. A player of the real-time strategy game *StarCraft* is free to play one of three races in an interstellar conflict. The single-player campaign takes players through all three of them, interconnecting them effectively to one whole saga enacted by the player. One participates in the conflict from multiple positions/roles and understands the spatiotemporal conditions of the game world as well as the logic behind each of the opposing factions much better. Here, players are not grounded in any single role but still achieve a better understanding. *StarCraft* is a real-time strategy title with very limited character development. The effect can be even more dramatic when the character aspects are more important, as seen, for example, in the title *Indigo Prophecy (aka Fahrenheit)* (Cage 2005). In *Indigo Prophecy*, the player switches between different characters facing a conspiracy and each one holds different parts of the key to the final question. Players engage with the game world as detective as well as murderer, among other roles.

13.2.3 Active Participants in Multiple Roles

The variable narrative positioning of readers of books or audiences of films is a valuable element of these media’s narrative capabilities (for a discussion of perspective in film, see, e.g., Bordwell 1985; Wilson 1988, and for a discussion of narrative perspective in literature see, e.g., Genette 1980; Bal 1985; Herman 2002). Likewise, players of video games can use virtual characters as different windows to the game world. Each character can offer a specific perspective through special restrictions in functionality and forms of presentation. Each character can enact and interpret a certain action differently. Shifting the audience’s perspective toward the action offers itself as a higher form of evocative narrative element. A new role changes a player’s expectations of the game space; it offers new interactive options and shines a different light on the past ones. This widens the player’s comprehension of the game world and adds more layers to it. That is why these paragraphs argue for players as active participants in multiple roles to increase each player’s possible engagement in the game world. This does not imply an abolition of the idea of role as such—on the contrary. The argument continues for the need of a role as

such on a game world stage to position the player, but the role becomes a variable.

A variable player positioning implies flexibility and occasional distance from characters. Players have to detach themselves from one virtual persona, to leave one character behind and concentrate on another. Does this break engagement and propel the player outside the game world? One game series that uses a distance between player and virtual character is *The Sims* series. In *The Sims*, players are not staged as heroes in an adventure that addresses them but as controllers of an ongoing simulation between different characters that seem to live their life in a virtual suburbia. The positioning differs clearly from an Aristotelian idea of immediate engagement. Frasca relates this distance between the virtual character and the user to the theatrical principles of Augusto Boal (Frasca 2001). In *The Sims*, Frasca sees the user in a fixed position: as controller, who plays with characters like substances to be combined in an experiment based on the simulation settings in “non-immersive videogame playing” (ibid, 4). This decisively non-Aristotelian approach, he argues, allows for a different perspective toward the game world and new player experiences.

The theatrical concepts of pioneers such as Brecht and Boal questioned the established traditions of the stage as an off-limits and secluded space. In a comparable tradition, the camera work in the original *The Sims* does not pull players onto the virtual stage but can distance them from the represented virtual dollhouses in which the characters live. The visualization still provides a narrative perspective—that of the onlooking controller—but this perspective includes an analytical distance to the character. I look *at* the Sim character of a single mother with two kids and low income. The distance between player and virtual character is a powerful tool that not necessarily excludes players but involves them differently in the game world. *The Sims* can be extremely engaging and addictive precisely because *not* staging the player directly in the game world is part of its ingenious design. Finding one’s role in relation to the fictional world in this setup is a challenge. The player is participating in the Sims’ daily struggles and immersed in them but not as an actor on the virtual stage. Players can be highly engaged in the game and are likely to be immersed in the fictional universe (the virtual replica of a North American suburb), but they experience no significant level of presence in this world. They have a strong projected relation to it, comparable to our fascination with reality TV. We like our Sim because we look at him and not through his eyes.

The *SimCity* series takes this distance one step further. In *SimCity*, interactors shape the development of a virtual city in a game of urban planning and

management. Building a police station in one suburb might decrease the crime rate; building better transportation systems might improve the traffic flow; the city appears as a complex system that needs careful balancing. To be able to conduct this operation on the game world, players and their interactive options remain unaffected by the game space. They remain at a critical distance, which enables them to analyze the situation. Although they are addressed as mayors of the virtual city, power cuts to the town hall in the fictional world do not affect the player's interactive access. Traffic jams do not slow down the spatial navigation toward a hotspot that needs attention. A higher level of crime might ruin one's public rating as a virtual mayor but it never threatens the player's character directly—one cannot get robbed, killed, or run over in *SimCity*. The player is engaged but stays external to the game world.

Instead of seeing the player in a fixed, almost external position, Friedman sees the narrative perspective in *SimCity* as a constantly shifting one due to the game's functionality. Players participate in a wide range of planning and administrative issues to keep a virtual city prosperous and are constantly switching tasks. He argues that the player positioning changes so fast that a player ultimately identifies with the virtual environment "as a whole, as a single system" and that, as a consequence, the user identifies "less with a *role* than with a *process*" (1995, 9; italics in original). At other times he concludes for another simulation game, *Sid Meier's Civilization II* (Meier and Shelley 1996): "you do not identify with any of these subject positions so much as with *the computer itself*" (Friedman 1999, 11; italics in original). This points back to the computer as a tool and its rule-based technical aspects. In these situations, players look through the mediated plane and see the mechanisms underneath. The level of presence in the 3D virtual world is low, but the awareness of the underlying rule-based plane is high.

The necessary distance to the character implies a distance to the virtual space. This effect might be very helpful in certain game settings, but it is apparent that these game settings apply virtual space either as a distancing factor or they are not utilizing the full potential of real-time 3D game spaces. Conceptually, *The Sims* could be played in a 2D view. In fact, a basic 2D view is used by comparable titles such as *Creatures* (Grand 1997) and *Little Computer People* (Crane 1985). Sometimes players can explore the space much more in other engagements beyond the core gameplay. For example, *The Sims 2* includes Machinima production tools that turn the game world into a production studio. Machinima artists use these tools to narrate the virtual space and transform the flat playground into a deeper cinematic space. One cannot say the same about the use of space in the basic gameplay.



Figure 13.2 *Creatures* (top left); *SimCity* (top right); *Little Computer People* (left); *The Sims* (right); space is visually detached from the player

At times, a game's step from 2D to 3D reveals the necessary adjustments in functionality as well as presentation strategy. One example is *Lemmings* (D. Jones 1991), in which the player has to lead groups of seemingly suicidal virtual lemmings through a number of 2D spatial puzzles. Lemmings can have different abilities that can be activated by the player in order to direct the lemmings' spatial behavior and lead them through a level. Players can trigger their lemmings to block, build, or dig, but the game does not provide any elaborate control over the camera work. Visual exploration is not an issue because the levels are clearly laid out. Through careful planning and timed execution of these abilities, the player has to guide the lemmings through the specific level, solve the spatial puzzles, and lead the clueless lemmings to safety and into the next puzzle. As in *SimCity*, players remain "gods" and never enter the levels themselves. They do not become part of the game space but operate on it and its inhabitants. In a setting like that, the map can be the problem

itself and the player's relation to it remains fixed. But the very moment one adds operational 3D worlds, the conditions of the game change and a fixed player positioning outside the game world starts to give way to a more direct involvement in the game space. One of the numerous sequels to the original *Lemmings* game, *3D Lemmings* (Hall and Thomas 1995), copies the original's principal design but adds 3D virtual space as its main new gameplay element: in the game's introductory sequence a former 2D lemming literally discovers the third dimension. With that discovery, the conditions of the basic setup change completely and the player positioning is very different. The 3D game not only includes elaborate camera controls but also features a "virtual lemming" mode where the player inhabits one of the game characters.

The feature can become important at times, for example, when the default camera views cannot reach certain spots on the level. In such a case omnipresence and god-like distance are no longer supporting the necessary gameplay features due to the new spatial and visual conditions. The god-player has to descend into the virtual world and choose a role because the 3D space demands his presence.

Operational 3D spaces like the one at work in *3D Lemmings*, which allow the player to enter the playground with all its possibilities and restrictions, call for elaborate presentation forms that enable flexible player positioning in relation to the game space. As much as *3D Lemmings* quotes the game mechanics of its predecessor, it is an entirely different game due to its 3D game world and the resulting gameplay, the effects of the surrounding game space on the player's interactions, and the different game experience that calls for a new and flexible player positioning.

Players have learned to read changing camera viewpoints and user-controlled editing and understand fundamental features of game space presentation and changing positions within it. Through growing familiarization, a wider functional vocabulary can be applied that supports changing perspectives to suit the unfolding events. The player can play god and mortal lemming in *3D Lemmings* as well as killer and detective in *Indigo Prophecy*. Early on, such a variable assembly of multiple viewpoints visually and conceptually has been identified as a powerful option in digital media (Oren et al. 1990). But the new argument for the multitude of different viewpoints derives from the titles' spatiality and plays with the generation and understanding of space. It is not only a question of classic role-playing but also of spatial positioning. Multiple perspectives might be not a narrative option but necessary to understand a given 3D virtual space.

In the survival horror game *Siren*, the player has to lead various characters through a zombie-infested nightmare world. Control usually switches from

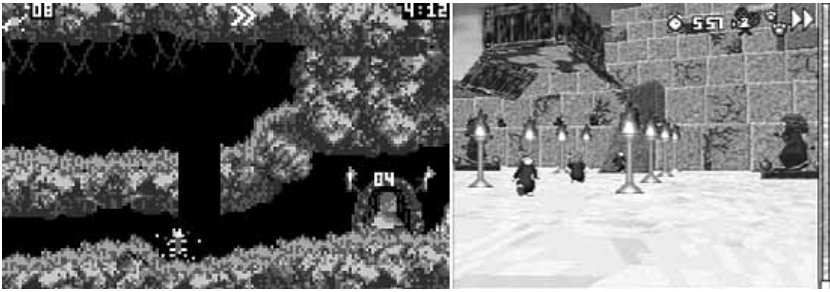


Figure 13.3 *Lemmings*; the original 2D world (left); 3D *Lemmings* (right) dealing with the third dimension

mission to mission among a number of main characters. Each time a new mission starts and the player's controls transfer to a new character, this virtual hero starts at a different time and space of the game setting. Only by playing all missions in the best possible way do the pieces of the jigsaw puzzle assemble to form a whole and the interconnections among the various states and characters become clearer. In one mission I might control an arrogant university professor, in another a blind girl and her dog, in yet another an old man. However, the events and character storylines only add up to the full picture of the haunted island when combined. But this is not the only way that *Siren* enforces the idea of player repositioning during gameplay. As discussed in section 7.8, I use the game's specific sight-jacking feature to temporarily inhabit my enemies. I constantly check nearby zombies' views and movement patterns to plan a route through these dangers. I zap from undead to undead to virtual hero to sidekick character to dog and back in what feels like channel hopping between different perspectives toward the same game space.

Players of *Siren* have to form an image of the game space through constant perspective change. *Siren* has been criticized for being too difficult in this regard and the problems of its presentation have been discussed earlier in section 7.8 on interactive montage, but it illustrates a fundamental understanding of how game world and flexible player positioning can depend on each other. Whether in the overall predefined setting or the single location, the "whole" is always fragmented into multiple viewpoints and positionings. Players are situated in the game space, but only through countless changes of the perspective can the player make sense of the game world in *Siren*. The value of a player as active participant in multiple roles reaches from the critical distance of *SimCity*, to the necessary role change due to the game functionality

in *3D Lemmings*, to the analytical, multilayered spatial reading of *Siren*. Because virtual space demands a positioning of the player in relation to it, functional 3D video game spaces significantly increase the push toward a role, and multiple roles can be the only useful way to convey the space—this may be via a critical distance or immersive engagement. Roles and the way they connect a player to a game world stand out as a player-focused approach to shape the game experience. Roles become complex and large-scale conglomerates of evocative narrative elements as they provide and exclude certain elements of the game world to the player. With a growing literacy in games a wider and more flexible approach to different roles emerges. Ultimately, functional game spaces encourage a dynamic usage of these roles. This illustrates a growing complexity of these titles. As players learn to read a game space as a complex spatiotemporal setting, multiple roles position the player in different perspectives toward the game world and assist in a deeper exploration of it.

Story Maps

Evocative narrative elements, flexible structural formats, guidance in the presentation, dynamic player positioning through functionality—all aim to support a meaningful game space. The following pages look at how they shape a player’s understanding of the game world. To discuss the players’ comprehension, we return to the notion of the cognitive map. As discussed earlier, players’ navigation in a 3D virtual world depends on the creation of a cognitive map of the space just as it does in the physical world. A *story map* is the result of this reading of the game space in combination with the directed evocative narrative elements encountered along the way. The game space, the events it includes, and the position of the player in relation to them are dramatized and contextualized. The narrative evocative elements at work do their best to affect the cognitive map. The result is the story map that consists of a form of cognitive map grown from the interplay of presentation and functionality, guidance and player positioning. Ultimately, every story map is a cognitive map that has been heavily influenced by evocative narrative elements as the player experienced them in the game space. To clarify this new term further, this chapter examines and exemplifies the importance of the cognitive map for virtual environments. The connection between narrative and cognitive maps has also been discussed in cultural studies (e.g., Jameson 1991, 1999), but the following paragraphs clarify how this connection in the video gaming context depends on a game’s spatiality.

Numerous experiments have been conducted that emphasize the importance of cognitive mapping in virtual environments (for an introduction, see Péruch et al. 2000). Concentrating on navigation in virtual worlds, Elvins, Nadeau, and Kirsh (1997) tested the importance of landmarks in virtual

environments and proved their effectiveness, especially in the setting of a virtual cityscape. They concluded that landmark features in their virtual world had to be in certain proximity to support users' orientation. Steck and Mallot also investigated the use of landmarks in virtual spaces and distinguished between local and global ones. Supporting Elvins, Nadeau, and Kirsh, their findings prove the value of both kinds of landmarks for navigation in virtual spaces (Steck and Mallot 2000).

Offering advice in the assembly of those structures, Vinson suggests various guidelines based on Kevin Lynch's work and argues that they help to avoid distortion from the graphically represented data. Among these guidelines are: a designer should arrange the environment's paths and edges in a grid-like form, the landmarks' main axes should align with the grid's main axes, and each landmark's main axes should align with those of the other landmarks (Vinson 1999, 283; related, see also Chen 1999 for spatial navigation of information visualization and Sparacino, Davenport, and Pentland 1999 for navigation of news through a virtual city space). Vinson is focusing clearly on basic usability issues. A dramatic impact—often the goal for game worlds—is not covered by his guidelines.

Darken works in the field of spatial recognition in virtual spaces, navigation, and wayfinding (Darken and Sibert 1996; Darken, Allard, and Achille 1998; Darken and Banker 1998; Darken and Peterson 2002). His work often refers back to the use of real-time 3D spaces as training areas for activities in physical environments, such as training for armed forces, comparing the applicability of virtual settings to physical ones. Again, the focus, by and large, is on the usability of these worlds mainly in reference to real-world tasks.

In the examples mentioned previously, Kevin Lynch's concepts were mainly used to present data visualization or to optimize orientation in virtual space. Many of those projects use 3D worlds as training spaces for real-world tasks, but they do not focus on the needs of video games that provide spaces for virtual drama. Video game spaces demand navigation and orientation, but they rarely present their content in the most open and immediately accessible manner. Instead, game worlds reveal their elements in an engaging and stimulating way. That is why section 3.5 suggested dramatic representation, comprehensible multilayered access, and timing/rhythm as additional features in game worlds and added them to more usability-driven criteria. That is also why a dramatic and dynamic player positioning replaces a neutral "user." Distortions, surprises, and disorientation when "losing one's way" restrict usability and accessibility but can enhance immersion and drama in a game. They can be devices to create suspense or other forms of pleasure. Because

game spaces have their own agenda, they operate in their own ways to support this kind of engagement.

The shape of the virtual environment does not have to be completely clear from the start or even fully explored by the end of the gaming experience, but it does have to evoke a striking impact. Video game spaces rightfully can be seen as mnemonic spaces, but they differ from the aforementioned projects insofar as the information in them is dramatized to achieve this impact. The density of evocative elements and the dramatization of space try to support a close net of engaging references in the player's cognitive map. In fact, the main value of such a story map in games is not navigation but dramatic contextualization. Players can be lost, but as long as they remain engaged, the story map eventually improves.

Games position their evocative elements to make sure that a location is not only a visual cue or a point in a coordinate system, but also can be a feared obstacle, a safe home base, or a crowning achievement. Strict guidelines as formulated by Vinson or Elvins, Nadeau, and Kirsh do not address this. Another element that is underrepresented in the mentioned projects is guided visualization. Instead of the first-person point of view, which dominates these research projects, video game spaces can come to life through complex cinematic mediation. The narrative filter of the camera can create a role as it situates spatial elements and events in relation to the player. Through its gaze, a certain identity and meaning can be assigned to each structure as well as to each event, almost independently from their geometrical form. The interactor, then, has become an active participator in often multiple roles. Unlike in the aforementioned projects, games can shift player positioning at any given moment. It is because of that shift that a player can make sense of the overall situation in games like *Indigo Prophecies* or *Siren*. This positioning shapes the story map because it makes sure that the event is read from a certain perspective. The reading is not only a product of the events and their spatiotemporal and conditional setting, but also shaped by their narration through the camera and positioning.

Like any cognitive map, a story map is a highly personalized interpretation of the data presented. But more than other environments, virtual worlds can shape the dramatic representation, which directly impacts the comprehension. The cognitive map in video game spaces is built on the experience and interaction with narrative evocative elements. Their presentation and functionality is not random but based on the rule-based plane. It is up to the designers of the video game space to deliver the evocative narrative elements that support the construction of the story map in such a way that the reading allows for a meaningful interpretation. It is part of the player's "work" to deliver the

comprehension of the game universe and to act upon it. In contrast to the cognitive map generated primarily for orientation, a story map aims not at an accurate understanding of Euclidian space but of spatialized drama and its setting; it combines navigation of drama, film, and interactive space.

Various researchers in the field of literary studies have targeted the combination of space and narrative. Brooks refers to a metaphorically spatial uncovering of plot elements in literary works, quoting a Sherlock Holmes story in which Holmes traces the original crime both spatially and temporally during his investigations that form the detective story itself (Brooks 1984, 26). Murray combines space and story (1997, 131–132), likewise, Ryan points toward the “text-as-world” metaphor in a model of the textual space as a “three-dimensional environment to be lived in, an area for travel, a landscape and a geography to be discovered in time. It is mapped by the bodily movements of characters from location to location” (2001b, 195).

But the closest literary concept to story maps is Herman’s theory of the *storyworld*. He defines “storyworlds” as “mental models of who did what to and with whom, when, where, why, and in what fashion in the world to which recipients relocate—or make a deictic shift—as they work to comprehend a narrative” (2002, 9). Herman describes the connection between narrative and his storyworlds: “narrative can also be thought of as systems of verbal or visual cues prompting their readers to *spatialize* storyworlds into evolving configurations of participants, objects, and places” (ibid., 263; italics in original). Storyworlds are seen as the cognitive results of the story-making process cued by the author and completed by readers. Herman indicates that Kevin Lynch’s structural elements of cognitive maps can be traced in them (ibid., 279) in a way that is parallel to the concept of story maps for video game spaces proposed here.

The difference between the concept of story maps and Herman’s storyworlds grows from their differing creation and spatial precision. Herman focuses on the creation of space through a linear literary-based system, while story maps evolve during the exploration of a visual descriptive and interactive virtual environment from which a narrative understanding of the space is generated. Space and spatial understanding in storyworlds are achievements of the discourse. In contrast, the virtual space in a video game world stages the discourse. The game space is not purely imagined, but is itself an expressive and functional element. Herman concentrates on the creation of space through a narrative. He does not investigate spatial systems and how they generate narrative.

Both approaches lead to cognitive maps that are heavily influenced by narrative. But there is a significant difference between a reader comprehending

a linear literary text evoking a storyworld, and a user creating a story map from the interactive exploration of game space. The precise visuals and functional architectural vocabulary describe the latter process much more accurately than textual descriptions that are the basis for Herman's approach. Because their spatial presentation is precise, virtual spaces can deliver multiuser 3D worlds that allow interactors to share a space and be active in it and in relation to each other—up to the highest detail. Players can understand the spatial relationship between each other as well as map the surrounding structures. The same precision cannot be achieved by literary texts, where the individual imagination rather than a shared visual cue create an image of a location.

It is possible to share a room in the text-based worlds of MUDs, but the spatial interaction between users enabled through literary ciphers stays wide open for interpretation. This is by no means a negative effect as players in a MUD can be highly engaged with their individual interpretations of the game world. It can be a highly motivating factor that these textual descriptions allow a wide range of possible interpretations. However, it is impossible to play a session of *Counter-Strike*, a multiuser computer game that relies on precise and shared spatial understanding, in any literary form that would provide comparable spatial functionality. Literary description is visually less precise than the visual-spatial description provided by the moving image. The processing of rule-based spaces allows the computer to provide such shared environments in which the exact position of any player, any structure, every single bullet and movable object are indisputably defined and can be shared due to this clarity.

However, although Herman stays within the literary tradition, his incorporation of cognitive science and his reference to spatiality emphasize the same connection of narrative and space that is made here. No matter how detailed the description of the world is, the player's comprehension of it is still a cognitive process and it is here that story maps mirror Herman's storyworlds.

Among the researchers who explicitly step away from literary texts and toward video game spaces, Fuller and Jenkins (1995) outline parallels between travel journals and travels in virtual locations. They point out the importance of a spatial structuring of content within a *spatially explorable* immersive game world, as opposed to a *textually described* world. Their comparison implies that cognitive mapping of the virtual space is necessary, as only an understood space can be translated into a travel log. Ryan refers to this approach: "If the body in space is the dominant theme of VR narratives, the most important component of the plot will be the setting, and the narrative structures will

be predominantly epic: the user will explore fantastic landscapes, navigate a space fragmented into multiple domains (the rooms of a castle, the diversified geography of an island, even the books of a library), take possession of virtual worlds through movement and action, or achieve intimacy with the environment” (2001b, 322).

Like this argument, Jenkins as well as Ryan connect the narrative elements with the spatial ones, arguing that one comes to life through the other. Numerous researchers have picked up on this thought (for an overview, see von Borries, Walz, and Böttger 2007). Friedman goes one step further, arguing that “computer simulations bring the tools of narrative to mapmaking, allowing the individual not simply to observe structures, but to become experientially immersed in their logic” (1995, 9). Friedman offers a comparable concept to the story map proposed here: “geography itself is not the protagonist; rather, the protagonist’s experience of geography structures the narrative” (forthcoming, 17). But Friedman’s conclusions that a map in a simulation is “the hero of the story” (*ibid.*) contradicts the concept of the story map proposed here. Space contains the triggers for comprehension, but it is not the hero of the story. A story map is the result of a player’s comprehension of the discourse with the video game space. It is not present in the game itself but evoked by it.

Finally, Champion combines vistas and encounters in virtual space to “memento maps” (2003), which are combined with the spatial cognitive maps. The functionality of memento maps covers the user’s memory of past events. Consequently, Champion argues for a virtual heritage based on past events (see also Champion and Dave 2003). Past events, indeed, form an important part of the story map, but in contrast to the “memento map,” any story map includes expectations and intentions by the user reaching into possible future events. In order to remain active in a navigable game space, players have to think ahead, project space, and drama yet to come. Game worlds are not only aimed to improve spatial navigation—a feature that Champion points out as the main feature of his model—but at the development of a past, present, and future meaning of the game world. Players select their own experiences and use them as personal navigation devices. The “memento map” with its focus on orientation and comprehension and organization of the past is only one half of the story map.

Story maps draw from the presented range of approaches but take an own position in this field. They are an extension of the established concept into the new domain of 3D game spaces. The following pages aim to expand the influence further into the social plane and demonstrate how past interactions and shared events improve the forming of the story map.

Places of Shared Stories

More than a decade ago, Provenzo argued that in the form of computer games, interactive digital environments “are redefining the symbolic underpinnings of our culture” (1991, 33). Thanks to their massive presence and impact on other media, the role of video games today has certainly come closer to that claim. Games have become widespread cultural artifacts. As a result video game spaces increasingly become places of cultural practice and cultural significance.

How do they incorporate this quality? This chapter will follow the development of story maps as they enter a shared cultural sphere.

15.1 Emergent Places

Establishing some form of hierarchy between the five planes of video game space depends on the perspective. If one starts from the player’s perspective, then one might argue that they seem to keep on adding to each other from the moment the computer is switched on. Players open up a play space and are confronted with the mediated world based on the rule-based plane. Through the discourse they shape a fictional world based on the given signs as well as their expectations and information collected from the packaging, commercials, and other media. They project some rules and logic into the image and adjust their interaction to that. While the original fictional plane is a highly unique one, the precision of the space’s presentation and the shared functionality allow for effective sharing of navigable and distinct space. Shared space offers players shared events that include shared evocative elements. Elements of the social plane are interwoven with all other analytical planes:

through the ideas of designers and algorithms implemented by coders, it is reflected in the rule-based plane; its specifics can attract a group of players whose use of these rule systems can outgrow the virtual and flow into the play space. In other words, video games as cultural artifacts are connected to the social underpinnings of our culture on multiple levels. Video game spaces offer the opportunity to anchor cultural practice precisely at a certain location and time in a 3D world.

The academic community early acknowledged the relevance of virtual space for cultural practice and social activities. Researcher did work to investigate the shaping of virtual communities (e.g., Bruckman 1992; Rheingold 1993), the question of a user's identity in this world (e.g., Turkle 1996; Stone 1998), and the awareness of other users present in the environment (e.g., Donath 1997); as well as the impact of digital media on society in general (see, e.g., Castells 1996, 1997, 1998 or Mitchell 1999). Recent work looked especially at massively multiplayer online role-playing games and investigated their social networking (e.g., Williams 2003; T. L. Taylor 2006), persuasive games (Bogost 2007), and the Serious Games movement. Each of these topics highlights cultural tropes.

In the field of video game spaces, many researchers have found social spatial behavior transferring from the real to the virtual environments. Social conventions have been found in text-based chat worlds as well as in graphical multiuser worlds (Becker and Mark 1998). The emerging social meaning has been identified by Harrison and Dourish as the effect that creates "places" from virtual "spaces" (1996). The placeness of a virtual space depends on the player's (social) interaction as the interactor realizes the potential meaning of the virtual space, comprehends it, and acts upon it. Virtual places are created through the whole of this experience.

Transfer of even simple social behavior into virtual worlds adds immense complexity. In multiuser spaces the interaction among players constantly changes the spatial conditions and mirrors social spatial behavior. A basic example is the distance between virtual bodies during their interaction. For example, the private sphere of the space encircling a single user-avatar depends on spatial positioning and indicates a spatial form of interaction that is directly imported from our behavior in the physical world (Becker and Mark 1998; Schroeder and Axelsson 2000; T. L. Taylor 2002). As in real life, players seem to acknowledge this personal space and the immediate surroundings of user-avatars seem to mirror real-life private spheres. They carry the notion of intimacy that can be invaded or respected through spatial behavior, and users tend to react if these spaces around their user-avatars are invaded. Such an effect clearly depends on spatial configurations: the positioning of different

user-avatars in relation to each other. It provides a notion of intimacy depending on the underlying game engine.

Other examples of spatialized social interaction in multiuser game worlds are: dance festivals that use the spatial movement of avatars (T. L. Taylor 2002, 48; Matsuda, Miyake, and Kawai 2002, 20), formation of virtual group assemblies (Becker and Mark 1998, 9–10), battle formations of player parties, or virtual demonstrations that become meaningful on the grounds of the sheer spatial presence of user-avatars in a certain location at a certain moment (from Morningstar and Farmer 1991 to T. L. Taylor 2006). Virtual demonstrations have spread throughout online worlds, whether in the early worlds such as *Lucasfilm's Habitat* or *Ultima Online* or more recent environments such as *Second Life*, *World of Warcraft*, or *Star Wars Galaxies*. Depending on the individual protest, a demonstration in an online world can expand upon the shared rule-based plane. Virtual demonstrations can actually break this rule-based plane by affecting the server. If large groups assemble at a single location, they clog up these world sections, slowing the game to a standstill. In-game spatial behavior, thus, can affect the hardware performance and by extension the rule-based space, and with it the playing experience of not only the players involved in the protest but every player logged on to that server. So whether it is at the Theed starport in *Star Wars Galaxies* or the Ironforge auction house in *World of Warcraft* where a protest is staged in the virtual game world also affects the underlying server, namely the Intrepid server of Sony Online in the case of *Star Wars Galaxies* and the Argent Dawn server of Blizzard in the case of *World of Warcraft*. In both cases, the demonstrations that were staged at these locations addressed in-game actions. A social issue, grown within the player community from a personal one to a shared cause, became a topic for all players as it forced itself upon the hard- and software of the rule-based space. On these occasions, the Theed starport or the Ironforge auction house form social places with relevance expanding far beyond their polygon structures. They constitute public spheres that stretch across all five planes.

With the growing interdependencies of virtual worlds and physical spaces, protests are no longer limited to fictional in-world issues. In January 2007 many inhabitants of *Second Life* gathered in an organized protest against a virtual office of the Front National, an all-too-real right-wing political party. The protest developed into a surreal battle fought with weapons only available in virtual worlds, from holographic displays to exploding pigs and gatling guns (Au 2007). They were a display of the creativity of the demonstrating users but they did not affect the virtual office of the Front National. Bullets and explosions left no traces on the Front; no polygon was destroyed. What was effectively brought to a standstill was the server that hosted this area of



Figure 15.1 The Martin Luther King Jr. sun over the site of the Front National protest in *Second Life* (Au 2007)

Second Life. The same problems of strain on the server mentioned earlier applied here too, but the protest also highlighted innovative ways in which massively multiplayer online games can react to political challenges. For example, to honor Dr. Martin Luther King Jr.'s work (as opposed to the anti-immigrant rhetoric of the Front National), a special sun was created for *Second Life* with King's face inset.

In the form of the sun image, a political statement was presented that carried throughout the whole grid of the online world, including the offices of the Front National. Virtual bodies—spectral objects like the sun as well as player-controlled avatars—shape space into meaningful arrangements. A strong parallel to Lefebvre's concept of space as product of social interaction becomes particularly apparent in these formations and interactions of human-controlled activists. But virtual spaces are highly directed in the way they can be used. Game masters can forcibly teleport avatars, change

access conditions, or even ban players. The protest against the Front National ended with the withdrawal of the virtual party headquarters and the victory of the protesting users. However, Linden Labes, the operating company for *Second Life*, can and did break up other demonstrations. Unless one hacks the main engine, the rule-based system and its controller can always suppress these kind of activities through their in-game restrictions.

15.2 Functionality in Social Virtual Places

These restrictions can take extreme form in the game design and be manifested in the game space. Some multiuser game spaces only allow virtual confrontations as their main functionality. Battle arenas are the sole spatial structures for the constant fighting in *Quake III: Arena*. Other game spaces focus on verbal user-user communication, enabling interactors to meet in virtual environments, trade objects, and chat with each other on the model of a communal piazza or marketplace as seen in the 2D worlds of *VZones*. The more recent *Habbo Hotel* (Karjalainen and Kyrölä 2000) uses the metaphor of virtual urban spaces to support its user community in their chat and customization activities. The now extinct *Cyber Park* (n.n. 1997) as well as the current *Second Life* offered a variety of ways to give objects, articles, or virtual money to other users, but largely excluded the possibility of stealing them. In contrast, the “capture the flag” mode of *Quake III: Arena* explicitly asks two groups of opposing players meeting in a shared virtual space to steal the enemy’s flag. The *Quake* series lacks market places and designated chat zones but features spatial structures that dramatize this action. These maps include narrow bottlenecks (choke points) or open areas that allow for specific game-playing styles that are part of this particular interaction. The same is true for *Counter-Strike*, which unlike *Quake* has a form of equipment shopping/selection in every round as it allows players to reequip their avatars at the start. But this “marketplace” is not a place but a temporal phase. One has only a short time to make the selection at the start of a new round. There is no visible piazza or market. If there are marketplaces in the virtual game world of *Counter-Strike*, as in the *cs_italy* map, then they are not for shopping but are only differently shaped parts of the battleground. What you see is not what you get because the action is restricted to fighting even though the locations can be places of more peaceful social interaction. Even though the functionality seems to simplify the spatial participation, playing these game spaces is still a spatial discourse.

A game of capture the flag in *Quake III: Arena* is, in fact, a complex spatial and logical negotiation between all the interactors and the in-world components. I am teleported into a closed arena together with two handfuls of other

players. We immediately split up into two different teams. Our goal: to steal the opposing team's virtual flag, battle in close-range and long-range combat, protect teammates, recapture our team-flag if it is stolen, and collect extra equipment spread throughout the virtual world to enhance our fighting ability. The battle is frenetic and constantly changes as my teammates rush forward or defend our base, but the better my team gets, the more directed and coordinated our actions become. In order to win we organize our interactions. An online session in a *Worlds Away* world or in *Habbo Hotel* also offers complex patterns of spatial and logical interconnections, where interactors go shopping in virtual shops, meet, trade goods, and chat with each other. Both kinds of world are defined by a limited number of functions—one might even say Proppian functions. Players form very different social spaces through the use of these functions.

Worlds that are more diverse and cannot be defined by a single dominating interaction can spread different functionality between separate locations within the same fictional universe. *Second Life* allows players to own virtual property and manage it, and to fill it with certain features like virtual amusement parks, shops, galleries, offices, or gambling halls. Access and functionality can be restricted to these separate elements. The world, to some extent, subdivides into regions optimized for specific functions. A different kind of zoning is found in the original release of *Ultima Online*, which allowed players to battle each other and computer-controlled entities in certain areas of the world (e.g., dungeons and wilderness zones) while the killing was disabled in “secure zones” that let users chat and interact in a peaceful way (e.g., the virtual cities). The same effect can be achieved through conditional instead of spatial settings. *Everquest* does not offer any safe locations but uses the conditional “Player Killing” switch that defines whether a user-avatar can kill and be killed by other user-avatars. But *Ultima Online*'s approach utilized the game space in a more elaborate and engaging way combining spatial structure with interactive access. It motivates the condition through an in-game distinction that works on the level of experiential space, not on the level of abstract condition. Players do not have to understand the Player Killing switch as a game variable, but the same rule is hidden within the virtual world's explanation and context. In a reversal of the unfulfilled promise of the marketplace in *Counter-Strike* that operates only as battleground, the city in the original *Ultima Online* has specialized interactive conditions that identify it and structure the game's functionality in relation to other game sections. Digital media can enforce such a spatialized condition and turn their worlds into pleasant prisons, where presentation and functionality can merge.

15.3 Quests in Social Virtual Places

The use of the multiplayer space is harder to predict than in single-player game worlds, but designers can still try to shape the exploration and activity in them. These structures often take the shape of preplanned events such as treasure hunts, quests, or communal meetings. But preparing one-off world events demands significant resources from the designer team. In the case of the early *Habitat* online world, it proved so problematic as to be “foolish and impractical” (Morningstar and Farmer 1991, 288). King and Borland report from the beta test for *Ultima Online*: “When the game opened, it was like the first few minutes at an amusement park, when kids pour through the gates to populate a park deserted just moments before. The killing began almost immediately, as players sought to gain instant points, experience, and levels. The ecosystem—plants, herbivores, carnivores, monsters, and anything else that moved—was decimated too quickly for any of the subtle balancing effects to show up at all. Literally thousands of programming hours were wiped clean at the hilts of the beta testers’ swords” (2003, 158).

Balancing a game world seems like a Sisyphean fight but there are elements that allow relatively clear structuring. Instead of controlling the game universe as such, one can concentrate on more specific spatial interactions.

One element of the outstandingly successful online game *World of Warcraft* is that—against Morningstar and Farmer’s view—it offers thousands of quests throughout its game space. While the in-game creative options are limited in comparison to other titles (e.g., it does not copy any complex ecosystem with any great detail and no users are allowed to build their own spatial structures in the game space) it has proven to be highly successful with players—so successful that it serves as a model for other online games seeking to copy this part of the formula. Notably, the originally rather open game universe of *Star Wars Galaxies: An Empire Divided* was adjusted toward a comparable quest-driven formula (Rausch and Kosak 2004). The resulting predefined content elements arranged by the designer team to shape the experience are a powerful and widely accepted approach to position evocative narrative elements into quests, but in lieu of the dynamics of player-inhabited social spaces the alternative is even more promising. Even the most advanced multiuser online world can contain only a limited number of predefined quests, and generating procedural quests in dynamic spaces remains the exception (Ashmore and Nitsche 2007). To stay interesting, this philosophy depends on user events and emergent play. Players use the evocative narrative elements during their interactions in a unique way and make them their own through

this usage. But other user-defined events can build on top of the already established structures.

As outlined in chapter 2, interactors can take control of the options provided to them by the game developer. They might decide to go on a hunt for virtual animals, make a virtual discovery journey through unknown territory, or launch a personal vendetta against another interactor in the virtual world. Or they might decide to use the game stage for unexpected activities like the aforementioned demonstrations. The potential for such events is merely provided by the virtual world's design.

Even very basic worlds with limited interactive elements offer the potential for interactors to form self-designed activities. The creators of the *PAW*² multiuser online environment refer to it as a “pre-Stone-Age world, which had almost no tools” (Matsuda, Miyake, and Kawai 2002, 23). This did not stop inhabitants from making creative use of what little functionality was provided. In the case of *PAW*² the avatar collision-control feature prevented characters from walking through each other. It also happened to allow one avatar to stand on top of another. Based on this fundamental setting, interactors developed user-defined events during which they created avatar pyramids (ibid., 20). These events form a playful social gathering in virtual space, determined by the user's interpretation and utilization of the game world. The imaginative use of limited resources illustrates the power of self-designated goals and adopts patterns from improvisational theater that allow users to apply given functions in multiple self-designed ways.

In the light of this player-driven structuring, the interactor finally can be enabled to shape elements of the spatial setting itself. To make the behavioral and spatial logic of a piece accessible to the player, the designer has to hand over the tools of content creation and give up authority over space itself to the participating interactors. With these tools, players can shape the virtual world, which then shapes comprehension and narrative. The evocative narrative elements become the expressive vocabulary for the player interaction. They do not carry any single meaning in themselves and do not impose any predefined story but can be arranged by users. In these cases players do not play “to be told” the space but to tell it themselves. Evocative narrative elements that once remained in a designer's exclusive control have to become accessible to the player. They become part of the vocabulary and the design of any virtual stage that might host a player-created *fabula*. In such an environment, the network of evocative narrative elements is not predefined in a predesigned package delivered by the designer within the space, but becomes part of the playing functionality or at least in some other way accessible to the player. Users can prepare and stage tension and drama without the inter-

position of direct designer ordinances. Koster, a lead designer of massively multiplayer online role-playing worlds, exemplifies this with one example from *Ultima Online*:

Once upon a time, there was a very pleasant little tavern, the Serpent Cross Tavern. Players could build buildings in U-O [= *Ultima Online*]. Players could set up these structures, and they made them into their own, and they told their own private mythologies and told their own private stories in 'em. One day, this group of people called S-I-N, "sin," that was their guild abbreviation, decided that they were going to walk around all the player-run taverns and extort money. They formed a Mafia. And they went from tavern to tavern, and they said, we're going to destroy this place unless you pay us. And they came one day to the Serpent Cross Tavern—, you know, they were really boastful about it. They destroyed a whole bunch of role-playing hotbeds, came one day to the Serpent Cross Tavern, and found an army waiting there that creamed 'em. Setting. Expressive setting. That could not have happened without the ability for players to reshape their space and create a location for a narrative. (2001)

The fights at the Serpent Cross Tavern, which is located in an area of *Ultima Online* called Yew, are recalled also by the attacking Sinister (Sin) guild:

Finally the town rabble of Yew began to try and organize our removal. Every single non-SiN in the Yew area hated us and wanted our heads. They formed together as a coalition of role players bound on seeing our demise a new guild named GSH. Our battles with GsH were the funniest ones, with wide-eyed tales arriving from each battle. (2007)

In Sinister's version the overall battle is won by the Sin guild. However, the point here is not the accuracy of the tale but rather that it remains alive and remembered as localized event in the game space by both sides. Even for the Sin members, these fights remain legendary and the location and its use memorable.

15.4 Story Maps in Shared Game Spaces

Although the evolving story maps for this particular expressive setting differ from interactor to interactor involved in the events, the unfolding activities in the *Serpent Cross Tavern* sequence follows the model of the monomyth. Such a reading might identify the Sin guild as a threat to the status quo of the current world (the "wound" that threatens to destroy the *Serpent Cross Tavern*); the violation calls for a response (the "call to adventure"), but it cannot be expected that all users of *Ultima Online* followed this call (a partial "refusal of

the call”); those who heed the call organize the opposition (leaders can be seen as “mentors”); they gather and prepare for the confrontation of the raiding party (now already in the world of the specific and self-defined adventure); reaching its climax in the battle (the “supreme ordeal” of this setting, during which the solidarity of the group, their unity, and effectiveness are tested); ending with the enemy’s defeat, the survival of the *Serpent Cross Tavern*, and termination of the raids (the healing of the world) due to the dedication of the defenders. All of these stages are realized on the virtual game stage and depend on careful timing and execution, but they remain player driven. From the perspective of the Sin’s history, the event reads as the final historic battle in *Ultima Online* won by them, not the Yew defenders. “After that it became pretty boring on Great Lakes. Nobody to fight, no one to kill, no new challenges” (Sinister 2007). In their perception, their quest to build a dominating battle guild also had reached its end, and without new challenges the guild players started to emigrate to other games and into new game spaces.

Without imposing a linear narrative path onto the user, the event develops as an epic multiparticipant quest, staged at a certain time and place defined by the interactors involved. When Jenkins argues “for an understanding of game designers less as storytellers and more as narrative architects” (2004, 121), we now have to expand this concept to the player, who arranged the evocative narrative elements through his or her spatial practice in the game world. This user-created event will stay part of the users’ shared history in the world of *Ultima Online* and was retold by external observers (and designers, as in the case of Koster himself). The story also adds to the virtual place the connotation of the home of this battle, providing a history and context for the *Serpent Cross Tavern* and the Yew region not available previously. It adds character and history to the location, turning it from a neutral space to a characterized place. In other words, the events surrounding the tavern serve to *symbolize* the players’ different interpretation of the *Ultima Online* universe, signifying the spatial structure as a “cultural object” of the resistance against (or for) the mafia-type behavior.

The significance of user-driven events also becomes evident in examples of negative social interaction in multiuser virtual environments. Dibbell describes the event of a rape in a MUD (1996, 1999), which left parts of the virtual community in this MUD deeply disturbed. But what can be generally considered antisocial behavior can also be an ingenious and creative driving force in games. A massively multiplayer-driven attack in *Eve Online* (Emilsson et al. 2003) saw a guild of assassins—the Guiding Hand Social Club—operating for an anonymous client to kill a prominent and extremely powerful game player-character, the head of the Ubiqua Seraph corporation. The

promised “kill” was documented in screenshots including the final one of the virtual body in space (Francis 2005). Few activities would seem to be less socially acceptable than a hired murder. It is the declared goal of the Guiding Hand to bring grief and to crush their targets—but it is done in a role-playing way in-game. They use methods only available in-game, such as character play, forums, or game voice chat (Ethic 2005). The actual attack is only conducted inside the game space. In this particular instance, the attack spread over a range of virtual locations and developed in carefully timed stages to have the highest possible impact. In contrast to the Serpent Cross Tavern events, this player-driven quest is described mainly from the perspective of the successful “bad guys.” The event as well as the following discussion added considerably to the Guiding Hand’s fame, or notoriety, and remains part of this community’s legacy.

If a game provides access to these fundamental building blocks of its design, then it has to guarantee the consistency of these building blocks to keep the evolving virtual storyworld, its events, and conflicts coherent. Expressive and functional elements implemented through visuals, acoustic, spatial, and action-based means have to stay coherent in order to allow a far-reaching change of the world itself without the danger of destroying its fundamental mechanics and threatening its established cultural identity. *Ultima Online* generates a virtual world based on a highly developed role-playing culture that quotes sword and sorcery themes. Only a defeat of the Sin guild within the rules of this fictional world provides for a meaningful event and story map generation. If the confrontation had included extra-diegetic elements such as special weapons not available in the fictional world of *Ultima Online*, the borderlines of the fictional world would have been violated. The same would be true if magic forces would enter the tech-driven universe of *Eve Online*.

“‘Abdicating authorship’ . . . doesn’t mean ‘abdicating responsibility,’ for creating the rules and procedures of the world is an act of authorship that defines the space” (Doug Church in Meadows 2002, 54; italics in original). The responsibility of the designer shifts from the prepackaging of the story elements into one *sjuzet* to the development of an expressive vocabulary that describes the individual virtual storyworld sufficiently, but also allows for a satisfying and creative player access. Event, location, and dramatic context are player-created and the designer has to provide the necessary building blocks for the player to become creative. The emerging spatiotemporal arrangements will still be translated into story maps, but through the countless permutations provided by players, they gain far more complexity and the possibility spaces expand greatly. At the same time, the world can become deeper and more locations have the chance to turn into places.

15.5 Places Forming Cultures

Players get familiar with new game spaces and learn to master them, learn to read them, and project meaning into them. What they finally find in these spaces, then, is a new and altered “self.” So when we look at the future of video game spaces, we have to look at the player. The cultural significance of a game space is instantiated by localized player activity. An event is not happening “on the web” but is localized in a game world. This has become obvious in multiplayer online titles, but also rings true in single-player worlds. Game spaces have become part of our cultural spheres. Virtual societies can have a “home” in a video game space—one that stretches across the various planes suggested here but can have a defined location in a 3D virtual stage. Not only is such a “home” the product of a creative process by the player but—in accordance with Alexander’s concept of the pattern language—it is also capable of affecting interactors and their behavior. It can become a place for socialization of the player.

In past decades, television has fulfilled the role of the “medium of the socialisation of most people into standardized roles and behaviors” (Gerbner and Gross 1976, 175). Critics have argued that this has led to a loss of a “sense of space.” For example:

Electronic media [= especially television] have combined previously distinct social settings, moved the dividing line between private and public behaviour toward the private, and weakened the relationship between social situations and physical places. The logic underlying situational patterns of behaviour in a print-oriented society, therefore, has been radically subverted. Many Americans may no longer seem to “know their place” because the traditionally interlocking components of “place” have been split apart by electronic media. Wherever one is now—at home, at work, or in a car—one may be in touch and tuned-in. (Meyrowitz 1999, 100)

In experiential video game spaces, the “interlocking components” are working again because the player can situate an event in time and space. Players might be “tuned-in,” but “in” the games they find a space. Video games relocate us to new worlds to immerse and engage in—but located we are. They provide narrative filters that prepare the stage for new roles available in these spaces. For better or for worse, we are transformed and situated into a new context, and we “know our place” in this situation. There are still many communication channels that do not depend on such relocation, but game worlds offer us digital realms that put the place back into our reach.

Although the existing game worlds differ from the envisioned cyberspaces, they still carry the value for cultural significance called for by early cyberspace

apostles. Their initial hopes for the digital realms echo in many current discussions in games research such as games “as art” or Serious Games. Ultimately, these discussions refer to games’ value as cultural artifacts. To position an event in time and space is to provide a necessary context for the growth of such cultural value.

Throughout this book we have encountered a range of elements that affect the creation, use, and experience of such a cultural space: from architectural sample structures, to the level of presentation, to variable player positioning, to the comprehension of space and spatialized events. These elements provide designers and participating players with a powerful toolbox to use in shaping their games. Evocative narrative elements are the necessary building blocks to implement structure and the player’s comprehension of them ultimately results in the story map, which paints a mental image of the evolving cultural landscape in the game.

The greater our familiarity with video game spaces, the larger becomes their relevance for socialization. And the final spatial structure that might close these observations, while offering a glimpse into the future, is the kitchen.

The kitchen is a central part of one’s home—in fact, the oven as place for meal preparation as well as heating can define the center and heart of a family home in many cultures. The kitchen is the space of social gathering, of undirected communication as well as clear, productive functionality. One might discuss important family matters or play drums on the cooking pots; both are acceptable behaviors in a family kitchen. It is the place we keep not only the necessary nutrition but also our stash of chocolate and ice cream. And it is a highly unique and personal place. The same variety of events and relevance can be attributed to gaming and game worlds. In both kitchens and game worlds, creation and “use” are difficult to separate and part of a whole experience. As the game worlds turn into acceptable cultural places, communities discuss and alter them with an ease that was not imagined before.

On a different level, the kitchen metaphor continues to apply when we talk about technology and literacy. Kitchen equipment helps even untrained cooks create meals with ease. Fridges, juicers, microwave ovens, bread-baking machines, mixers, and countless other appliances assist us in the creative process. In video games, this function is provided by game controllers, graphical user interfaces, game design, rule sets, and all the other elements that operate on the five planes describing game spaces. In the context of video game spaces, these technologies mirror the vocabulary and processes that allow creative players to generate new contexts, new experiences, and new game spaces. Players do not only consume (as in a restaurant) but actively create (as

in a kitchen). In the same way that a modern kitchen helps us prepare meals, game engines assist their players in taking over the virtual space. They encourage players to accept the challenge posed by dynamic game worlds and become spacemakers themselves. Traces for this development have been important factors in the role of online communities such as *Second Life* or *A Tale in the Desert*, and they are mirrored in the various networks that game console developers gradually establish. Although it might seem as if companies and commercial interests are pushing these models, in reality it is the growing acceptance of game worlds as cultural places that drives them. It is the players' growing understanding of the video game space as *their* space—not the company's space or the designer's—that is responsible for the change. As video game spaces have been established, and their colonization has reached a certain level, we see their inhabitants settling in—and changing the face of the virtual world again.

What these worlds provide is more than “fun” and more substantial than entertainment. To stretch the kitchen metaphor further: if we envision games as food, then we have to be aware of the nutrition they provide. There is always the need for a quick snack that probably bloats the body without any reasonable nutritional benefit but that satisfies a sudden urge. There will also be the deluxe frozen meal, the can of generic tomato soup, the rip-off “taste-alike,” and the cooking disaster. There will be large banquets and stellar achievements that change the way we cook (or play) forever. Without a doubt, there is always a need for a professional chef, whose experience will result in outstanding results. Unlike the playground, the kitchen features a clear hierarchy based on knowledge. Cooking also features steep and endless learning curves. But a “game world as kitchen” has all the tools available to support the necessary range of expertise and to improve each player. What really feeds players are not the recipes of any single established master game developer, but how they adapt these structures, use them, make them their own. If you are a player, the game world is ultimately yours.

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