			versa?	types?	
Technological	How do technologies affect the player spatially, and how can the player affect game technologies in space?	How do technologies enable facets of modalities and new types of space, and how do modalities affect technologies?	How do technologies enable kinesis and play rhythms?	Which technologies and technological products are enjoyable for which type of play pleasure?	How do color and context affect the application of technologies? How do game technologies affect the space of culture?
Phenomenological	What makes the game a unique space for the player?	What is the sui generis quality of the game achieved with the help of modalities?	What kind of unique kinesis and play rhythms do we trace?	How does the gamespace achieve a singular play pleasure?	How have context and culture affected the uniqueness of the game, and how does that uniqueness impact culture and context?

Table 8A

A draft framework for analyzing and potentially designing ludic activities as human practices in space.

Table 8B

Draft framework continued.

PLAY-GROUNDS: AN ARCHAEOLOGY OF LUDIC ARCHITECTURES

"There is a long cultural tradition of spatial games – games like hide-and-seek and treasure hunt (...) which, of course, go back centuries before the computer" (Mitchell 2007:408). Are spatial games, then, only to be thought of in terms of hide-and-seek and treasure hunts?

In the following pages, a number of architectural formats are presented and considered as spaces that allow for or embody play activities or even games – in other words, ludic practices in space well beyond treasure hunts and hide-and-seek. To a certain extent, this short inventory also serves to illustrate precursors to (ubiquitous) games – these precursors can serve as design metaphors that designers can consider for their work. Yet, the role of computing technologies is not the main focus of these discussions; games are sometimes referenced, but not always. Rather, we intend to present an archaeology of playspace and gamespace as a means to achieve the overall goal of formulating a ludic architecture – a non-exhaustive pool of possible spaces that represent ludic qualities. Pay special attention to links between entries, which are bolded and underlined to indicate that they represent interesting trajectories.

One inspiration for this episodic organization are the writings by Georges Bataille, the brilliant, crazy, and highly entertaining poet-theorist who interpreted architectural metaphor and form as means to cement an existing order and "literal manifestation of social structuration" (Leach 1997:20). In light of this view, architectural theorist Neil Leach deems Bataille "a theorist against architecture." But Leach is mistaken; Bataille, especially in the short and episodic entries in his still-incomplete Documents dictionary, aimed to express, often drastically, the way that architectures in and of themselves can express the soul of a given society – a kind of space, that is.

We call the following ludic constructions of space play-grounds, a term we borrow from Huizinga (1971:10) and prefer to the concept of the magic circle or Buytendijk's playing-field mentioned earlier in this work. Using the magic circle concept would be inappropriate, for our discussion aims to discuss the ludic qualities of physical spaces

rather than analyze these spaces as gamespaces. In the following episodes, games are only referenced where appropriate. As Alberto Iacovoni points out in Game Zone, a marvelous pamphlet on the interplay of play, games and architecture:

The term playground generally indicates the areas that are set aside in gardens and urban parks for children to play: delimited, controlled spaces that are protected from the intrusion of the adult world by a high rail fence (...). The desolation of these playgrounds is the mirror image of a society which leaves very little space to playing, unless it is behind a fence, beyond the box office of a theme park, imprisoned and neutralized within the confines of "free time" (Iacovoni 2004:19).

In this book, by contrast, the term play-ground expresses the possibility that play can take many forms and take place in many locations. Note that play-grounds are not immediately game-grounds, which is why we refrain from applying Salen and Zimmerman's concept of the space of possibility to our discussion.

The inventory of architectural formats is structured as follows:

- **first, we discuss the role of the previously outlined concepts of game spatiality in this inventory;**
- **we next discuss the overarching spatial principles of play-grounds in the context of the phenomenological ideas of utopias, heterotopias, and dystopias;**
- **finally, we present the inventory in list form organized according to the ludic quality of each play-ground – for example, what type of play does the play-ground program? Often, the form of the entry is that of a collage: it is linked to other entries or presented as a compilation of remarkable features. This allows readers, in a certain sense, to play and be inspired. The general organizational rule for the entries is architectural scale – from the mind to XXL scale (the World), and beyond.**

1. About Play-Grounds

In the following discussions, we will, time and again, include aspects from the analytical framework that combine playspace and gamespace dimensions. This means that we will refer to categories of enjoyment, to kinesis and play rhythms, and to aspects of game spatiality such as allegory, contest, narrative, type, perspective, and function. We consciously apply the latter despite the fact that it is derived from digital games because we consider play-grounds as being subject to the inherent digitality that games entail, and as being subject to an overall computerization of physicality as has been demonstrated with the game of REXplorer.

Before we begin our discussion, however, we will offer a few words on the concept of allegory. From Aarseth's (1997) point of view, the concept may only be used as a lens through which to view computer games. Yet, physical spaces can be allegories of other spaces as well. This is certainly true of built environments created during the Baroque epoch, where allegorical architecture symbolizes a structure of complexity wherein images and meaning are interwoven like a net to create illusionary spaces (Burgard 2000). Baroque architecture and landscaping – and the allegory as the epitome of Baroque design – are particularly interesting for us and will appear frequently throughout
our discussion.

How, you may ask, did we choose which entries to include in this inventory and which to exclude, especially given that the inventory is by no means intended to be exhaustive? Sometimes entries were chosen for their architectural expressiveness (e.g. the Trompe l'œil or Folly), sometimes for their unique designs (e.g. the Tessellation or the Panopticon). Some were chosen for chronological reasons, (e.g. Cave, Labyrinth (and Maze)), others for their ability to specifically express play, (e.g. Stadium, Kindergarten, and Playground), yet others for their imageability as cultural myths ("Nature"). All entries are archetypical, and their uniqueness is therefore discussed. Some of the entries encompass more than one type of play-ground. The Casino, for example, embodies qualities that can be found at the midway, the tavern, or the arcade; Bogost (2007) mentions this as well. Other major play-grounds may seem to be missing from our inventory, but are, in fact, present. The street, for example, is mentioned in the context of the urban Playground entry, and the (pleasure) garden and rollercoaster fall under the Amusement Park heading. The inventory is thus a play-ground in and of itself: its interconnections must be questioned and puzzled over by the reader, by you. Note that the results of the design and playtesting phase of REXplorer are woven into the play-ground entries where appropriate, as are some game prototypes the author has been designing over the past years.

This game-like linking of play-grounds represents an application of the connectivist learning theory introduced by Siemens (2005) and mentioned in the introduction of this work. Our ludic trajectories also take into consideration the videogame inspired learning theory of "conceptual playspaces" introduced by Barab/Ingram-Goble/Warren (2008), which suggests using game(-like) mechanics for structuring educational content.

1.1. Utopia

A utopia is a counterspace, an ideal society that is either intentionally established (Sternfeld (2006), for example, collected contemporary quasi-utopianist attempts in the USA in a beautiful photography book) or theoretically conceptualized, typically in a piece of literature. Early texts on the topic of utopia include Plato's De Republica and Jewish, Christian, and Islamic religious writings about the Garden of Eden, all of which can today be considered forms of political and religious utopianism. But the term utopia itself was coined by a book of the same name, written by Sir Thomas More and published in 1516.

In the book, the imaginary island country of Utopia – derived from the Greek ou-topos, meaning not-place – is described by a traveler. The island is home to a society based on a perfect socio-political and legal system. All aspects of communal living are perfectly programmed, there is no such thing as private property, religions are tolerated, and atheism is outlawed.

Two aspects of Utopia are most relevant to our context. The first of these is More's explicit intention to provide delight, which is expressed in the actual and full title, originally in Latin: "On the Best State of A Commonwealth and On the New Island of Utopia. A Truly Golden Handbook, No Less Beneficial than Entertaining."[21] _The second is the way that the island's capital Amaurotum was not only societally, but also spatio-constructively designed as an allegory of the perfect city. We would thus content that Utopia is a piece of fiction whose goal is to delightfully immerse the reader in the rules of a perfectly organized game. Utopia describes not only a physical space meant to entertain those who read about it, but also a perfect living space meant to delight those who inhabit it. A utopia programs perfect behavior and therefore, perfect enjoyment.

Zinsmeister (2004:78f.) traces the way that Utopia not only directly inspired Renaissance literature and design, but how the urbanistic designs depicted in the book also anticipate the ideal of the modular, gridded, controllable city, which, in combination with Leonardo da Vinci's Homo Vitruvianus, still informs an architectural politics of total functionalism and measuring. In a 2001 keynote address to the London based Sustainable Placemakers Forum, architect Bernard Hunt reminded his audience that "Such people as Ebenezer Howard with his book Garden Cities of Tomorrow, Le Corbusier with his Ville Radieuse, and Frank Lloyd Wright with Broadacre City set out utopian visions of a better world made possible by man's progress in placemaking – and, for better or worse, their thinking inspired their times and profoundly influenced the shape of development in the 20th century" (Hunt 2001).

Venturi/Scott Brown/Izenour (1977:134) state that Vitruvius held that architecture is a question of firmness, commodity, and delight, and that Gropius – or maybe only his Bauhaus followers – taught that firmness (structure) plus commodity (program) equals delight (form). In this reading, then, form is equal to delight. But can applying the suburbanizing principles of social reformist Howard actually and inherently produce delightful dwelling? We can tell that Howard's garden city model inspired Walt Disney's original urban designs for a city in Florida called EPCOT, in which everyone "will have the responsibility to maintain this living blueprint of the future" (Disney 1966). And let us consider: Do Le Corbusier's principles of seriality and modularity (Le Corbusier 1975:59) really guarantee environmental enjoyment in the sense of a play or game experience?

At least one thing is sure: functionalism caused the Situationists to break the rules, to invent and practice their own rules and thereby create psychogeographically-reflected play-grounds for the drifting player-flaneur of dérive (see also the Society entry in the inventory below). Hou Je Bek (2007) describes how computation can take hold of this practice and become a critique to functionalized space in itself: The Universal Psychogeographic Computer (UPC) suggested by the Dutch group socialfiction.org lets participants solve a jigsaw puzzle or calculate the number Pi while taking a walk: during the walk, participants follow walking instructions written in pseudo computer program code (Hou Je Bek 2007:308f.).

There is a clash between, on the one hand, play-grounds that only allow for delight and

playing because they have been totally functionalized and therefore exist perpetually on the brink of dystopia and, on the other hand, play-grounds that come into being because they are intended to serve as a critique of the other, quasi-dystopic play-grounds. And yet neither type of play-ground can exist without the other. This conflict can be traced in movies such as The Truman Show, which "anticipates the computer game The Sims (...) and thematizes the closed and fully controlled space of life-simulation on the basis of a normative canon of values and consumerist strategies for success" (Nohr 2007:470).

The conflict is certainly embedded into the way we design nature and the way we feel overwhelmed with the designedness of our environs. The PS2 game Shadow of the Colossus (2005) features a twist on this conflict. In it, a battling player-hero must climb, fight and slay harmless colossi that are completely non-assailing, often with the help of the surrounding environments of ruins and geological formations, see Figure 8. The game, then, is really about "man versus nature, the player versus the environment as represented by the colossi" (Thomas 2007a:461); it has been described as "perhaps the most extraordinarily and unearthly of evil videogame architectures (...). Lairs within lairs." (Rossignol 2009). Because the player avatar kills the behemoths, one could argue that the player becomes the evildoer himself, transforming an untouched utopian setting into a dystopian one by the way of playing the game. However, because in order to play the game, the design of the game forces the player to kill (and, in the very end, punishes the successful player for his wrongdoings with death), it is the game designers who ultimately induce evilness and moralistic dilemma into the player's actions, interweaving them with the game's architecture.

That colossi, albeit less (or presumably) evil ones, are intended to please and astound the masses has been shown by the utopianist drafts of French Revolution architects such as Étienne-Louis Boullée and Claude-Nicolas Ledoux. Whereas Ledoux's architecture parlante has been accused of being representative of the Ancien Régime (which funded his work to a great extent), Boullée preferred the grand and abstract yet still playful and revolutionary design gesture. His 150 meter (500 ft) high perforated Cénotaphe sphere for Sir Isaac Newton (Figure 9), which simulates the spherical surface of the starry sky, stands out as an example of an architecture expressive of its purpose and as a stage of enlightenment that offers play pleasures such as vertigo, adventuring, and problem-solving. It is an allegorical dramaturgy that is also a technological statement of utopianist immensité.

Utopian cities and spaces rather often represent the notion of an enlightened-delighted, perfect, superhuman society that has battled nature by design in an attempt to achieve perfect square form-functions and perfect superhuman circles and spheres. But perfection is not what we get: "In reality, architects and builders have no choice but to proceed in the opposite direction. In the absence of an ideal society, they turn their attention to the shell, the city itself, as an ideal form. And in the twentieth century, this is increasingly replaced by themed entertainment, arcades, mega-malls, and amusement parks" (Herwig and Holzherr 2006:15). And, one might add, by the digital game, either virtual or, increasingly, hybrid.

1.2. Heterotopia

In his 1967 lecture Of Other Spaces: Utopias and Heterotopias (Foucault 1997), Michel Foucault investigates how space becomes institutionalized and how structures of power are demarcated. Foucault is, in fact, looking for those places in society that actually lie outside of society, but which can still be localized. Foucault is looking for spatial arrangements of the everyday – cinemas, cafés, beaches – that are simultaneously "represented, challenged, and overturned" (1997:352). Foucault, we could say, is looking for societal play-grounds.

He finds that we cannot localize utopias – they have no real space and are totally perfect, rendering them unreal spaces. But society does have spaces, spanning various ages and contexts, that fit Foucault's profile – realized utopias that "perform the task of creating a space of illusion that reveals how all of real space is more illusory (...) forming another space, another real space, as perfect, meticulous and well-arranged as ours [is] disordered, ill-conceived and in a sketch state" (1997:356). Foucault's examples of these heterotopias – simultaneously demarcations and inscriptions of the everyday – include the museum, the brothel, the cemetery, and the epitome of all heterotopias,
the ship.

The ship floats – moves, in fact, in tune with the rhythm of the ocean – from port to port. The ship is a closed program poised in the infinite, dramaturgical space that is the ocean. Along with the ship come dreams of economic growth, treasure, and desire.

From the beginning of its existence down to the present day, the ship has always been a reservoir of our imaginations.

There is an enduring heterotopia that Foucault could not and did not identify: the played. In other words, the realized play-ground of play pleasure (see the Playground entry above). When not played on or with, a play-ground remains an empty space – it needs a player, and sometimes one or more spectators, to come to life. Although the played play-ground is, formally speaking, demarcated from everyday space, using Foucault, we can read it as a heterotopian other feeding from and mirroring the everyday. We can thus think of playing as a heterotopian practice or, to extend the concept of Lefebvre's veçu, as a form of veçu miroité, i.e. mirrored lived space (1991).

This much we know: Just as Foucault has identified heterotopian types, we can identify heterotopian forms and programs typical of the computer game. To name a few, we will mention the tennis court, the dungeon, the mansion, the carnival, the castle (see the Castle entry), the shadow path, the panzer, the small town, the mushroom kingdom, the noir urbanity, the island, and the planet (see the World entry). Heterotopian computer game forms can also be abstract; think of geometrical space, sonic space, and, of course, mirroring Foucault's metaphor of desire, the space ship. All these heterotopian types program but also cater to a particular set of ludic activities. The dungeon programs and caters to role-playing in a system of maze-like tunnels wherein treasure is hidden and monsters such as trolls may be encountered and battled. The space ship programs and caters to six degrees of freedom-floating, trading, and encountering other space ships, species, and specimens of space.

In computer games, any given space can become a heterotopian space of simulation – as long as this heterotopia defers to the game's design and rules and, ideally, simultaneously programs ludic activities set forth by the game's design.

1.3. Dystopia

Utopian thinking and writing has given rise to the creation of anti-utopias as well. If utopias typically manifest counter-everyday spaces that supposedly provide their inhabitants with a happy life, then dystopias are societies characterized by extreme negative qualities such as repression, poverty, hunger, violence, or environmental hazards – challenges, we could say, to be overcome. Early milestone fictional dystopias include Aldous Huxley's Brave New World from 1932 and the classic silent film Metropolis by Fritz Lang from 1927. The latter is set in a Gothic skyscraper corporate urbanity state, where desperate underground workers (the "hands") sustain the lives of the ruling and privileged class (the "head") that lives high above them in luxury.

Many videogames have embraced similar and explicitly dystopian themes. Consider, for example, the first-person shooter role-playing game BioShock (2007). In the brutal and disquieting but highly moralistic game, the player roams through the beautifully inscenated, Art Déco-inspired underwater city of Rapture. Rapture was originally intended as a Garden of Eden by its builder and overseer Andrew Ryan, but then became populated by aggressive, genetically modified mutants and robotic drones. In other words, it transformed into a flawed utopia in which ordered society collapsed. By the way of the decaying narrative architecture, the player is led to believe that is is Ryan he must eliminate. Yet, "as the story unfolds, it becomes clear that, although you [the player, spw] will inevitably kill Ryan, his architecture tells you nothing about the nature of the enemy you face. Indeed, the true enemy has nothing to do with the stylized nature of this lair at all" (Rossignol 2009).

Dystopias, whether stylized as in the case of Rapture or as lairs in themselves, are play-grounds that feature inherent conflicts and thus inherent goals for player-heroes to achieve in that they exhibit word-flaws or imbalances that the player must overcome in order to turn the dystopia at least into a regular, if not a heterotopian world. The dystopian play-ground that encourages the player to sustain the dystopian condition and to prevent other players from taking control provides an exciting reversal on this conflictive topos of overcoming given circumstances.

In consideration of dystopian worlds as a basic form of ludic architecture, we draw your attention to the following interview excerpt, in which ubiquitous computing theorist Adam Greenfield, now Head of Design Direction at Nokia, argues:

Cities are all about difficulty. They're about waiting: for the bus, for the light to change, for your order of Chinese take-out to be ready. They're about frustration: about parking tickets, dogshit, potholes and noisy neighbors. They're about the unavoidable physical and psychic proximity of other human beings competing for the same limited pool of resources...the fear of crime, and its actuality. These challenges have conditioned the

experience of place for as long as we've gathered together in settlements large and dense enough to be called cities.

And as it happens, with our networked, ambient, pervasive informatic technology, we now have (or think we have) the means to address some of these frustrations. In economic terms, these technologies both lower the information costs people face in trying to make the right decisions, and lower the opportunity cost of having made them.

So you don't head out to the bus stop until the bus stop tells you a bus is a minute away, and you don't walk down the street where more than some threshold number of muggings happen - in fact, by default it doesn't even show up on your maps - and you don't eat at the restaurant whose forty-eight recent health code violations cause its name to flash red in your address book. And all these decisions are made possible because networked informatics have effectively rendered the obscure and the hidden transparent to inquiry. And there's no doubt that life is thusly made just that little bit better.

But there's a cost - there's always a cost. Serendipity, solitude, anonymity, most of what we now recognize as the makings of urban savoir faire: it all goes by the wayside. And yes, we're richer and safer and maybe even happier with the advent of the services and systems I'm so interested in, but by the same token we're that much poorer for the loss of these intangibles. It's a complicated trade-off, and I believe in most places it's one we're making without really examining what's at stake (Greenfield 2008).

In contrast to the all too perfect utopia (that which pervasive computing may bring upon us) and the heterotopian space that allows for playing out alternative realities, dystopias provide pleasure by setting up entirely unenjoyable, i.e. frustrating places that must be playfully escaped, saved, destroyed, or equilibrated. Utopias, heterotopias, and dystopias can all be measured by their artificial and conflictive, i.e. problem-solving potential. Whereas utopias are idealized, hyper-artificial spaces that we may never reach (a problem in and of itself), heterotopias temporarily realize our imaginations. Dystopias, eventually, encourage us to be involved in their systems in order to partially or fully dissolve them. The interview excerpt discusses the way that, ludically speaking, the quasi-dystopia of the city can become a utopia that may turn out to be a dystopia.

In the following section, we will examine play-ground topoi that resemble qualities described in the above section, thus further problematizing the dialectics of ludic architecture between control and agency.

2. Possible Worlds

Hegelian philosophy suggests that everything starts with an idea, with a possibility, and that all that is real is just a realization of an idea. We can imagine playing. That is, with our minds, we can make ourselves believe; and this pretense is a signature feature of our very being. In fact, the basis of games is our capability to imagine a possible situation and to construct a new and secondary kind of reality, according to both Oerter (1999:9ff.) and Piaget (1951). Game designer Noah Falstein describes this practice as "mental fun": "We practice and improve our mental abilities in our leisure time just as we exercise our muscles and build social relationships" (Falstein 2004). We can compare Falstein's concept of mental fun to Jesse Schell's concept of games that take place in zero dimensions, i.e. without a board or a manifest site. As an example, Schell points to the conversational game Twenty Questions, in which Player One imagines an object, and Player Two asks "yes" or "no" questions in an effort to guess the object (Schell 2008:134f.).

What is the coordinate system of the imaginary modality? What is its locale, its program? Are possible worlds always subject to mental realms? In an investigation of immersion (induced by virtual reality) and the affinity of the immersion concept to theories of fiction based on the notion of possible worlds and ludic make-believe, Marie-Laure Ryan observes that all these theories share:

A reliance on the semantic model of a set of possible worlds in which a privileged member is opposed to all others as the one and only actual world. The distinction actual/non-actual can be characterized absolutely, in terms of origin, or relatively, in terms of point of view. In the absolute characterization, the actual world is the only one that exists independently of the human mind; merely possible worlds are products of mental activities such as dreaming, wishing, forming hypotheses, imagining, and writing down the products of the imagination in the form of fictions. VR [Virtual

Reality] adds to this catalog of "accessibility relations" a mode of apprehension that involves not only the mind, but also the body. For the first time in history, the possible worlds created by the mind become palpable entities, despite their lack of materiality (Ryan 1999:117f.).

We have to disagree with Ryan. This "bodily mode of being in the world" (1999:137) is a phenomenon that, well before the invention of virtual reality and interactive media, was achieved by many architectural spaces that, form-functionally, aim at make-believe or serve as a stage for make-believe. Some of these play-grounds have been collected in the non-exhaustive inventory presented here.

From our perspective, computer simulation (which enables virtual reality) makes possible the development of different, new, and more complex types of games. Furthermore, computerization serves as a strong reminder that for thousands of years, we spatially and culturally demarcated play and games from everyday life, designated them as our "little feasts in the quotidian" (Bausinger 1999). With computerization, this dichotomy between The Game and The Quotidian ceases to exist; heterotopias can become pervasive, and, eventually, maybe even quotidianized. Let us briefly meditate on the Calvin & Hobbes comic strip "There's treasure everywhere!" to illustrate this hypothesis.

The cartoon – written and illustrated by Bill Watterson (1996) – shows the six-year old, imaginative boy Calvin and his stuffed and energetic pet animal, Hobbes, who has come alive. Hobbes is Calvin's partner in crime, not only anthropomorphing into a best friend, but also into a sardonic commentator – a play-other. In this strip's particular flight of fantasy, Calvin digs for buried treasure. In the first panel, Hobbes asks "Why are you digging a hole?" Answers Calvin, streaked with dirt and wearing a tropical hardhat: "I'm looking for buried treasure". In the second panel, Hobbes continues to ask: "What have you found?". Calvin lists, "A few dirty rocks, a weird root, and some disgusting grubs," handing Hobbes a sample. Taken with the rock he looks at, Hobbes smiles in the last panel, again asking "On your first try?". Beaming, Calvin responds: "There's treasure everywhere!"

Hobbes is interested not only in the activity – hole-digging – but also in the objects Calvin encounters, which may not seem appealing to most readers. To Calvin, though, the items are treasurable; they possess high affordance. What for, we don't know, and Calvin and Hobbes may not know either. That is because as objects, the treasures come alive only in the moment in which they are instantiated in a certain context. It is interesting to note that in this strip, Hobbes does not represent Calvin's potential maturity and externalized conscience as he normally does. Instead, both characters are immersed in the fascination of pantopian play. "There's treasure everywhere" then, is also a motto that is, at its heart, Situationist (see the Society entry of the inventory). It also implicitly reads: "Everything can be treasure!" – and, by extension, enjoyable. Calvin and Hobbes are participating in a situation of indeterminate possibilities, of an infinite amount of possible kinesis with magical rocks, roots, grubs, pets, holes, treasures, and games. The excitement that is at play here is the in-the-moment excitement of possibility – or, as Jorge Luis Borges describes it in his short story, The Garden of Forking Paths: "At that moment I felt within me and around me something invisible and intangible pullulating" (1962:99).

Whereas the permeating of computing technologies allows "possible world every-whereness," we can also understand the comic strip as a call to understand any given space as a possible play-ground. Think of all those risk-taking City exploration activities involving, for example, forgotten utility tunnels, abandoned subway stations, or inaccessible urban network structures such as pneumatic mail or pneumatic transportation[22]. In a clarion call to "acute exploration" of the metropolitan landscape, Stilgoe (1998) suggests that one go for a walk or bicycle ride in order to critically probe how certain places and processes, such as main streets and the postal service, are taken for granted, and to thereby become aware of "the mundanity of social interaction, of the built environment, and the technologies that bridge both" (1998).

Eventually, you, the player, negotiate where, with whom, and with what you draw the magic circle to play-move within a possible world of possible worlds. Note, however, that in the comic strip, we only see the play-ground in which Calvin and Hobbes are immersed, not the context and culture in which that play-ground is situated and not the parties who may be repelled by the imaginary modality. So in the spirit of Rosa Luxemburg, let us design possible worlds in which freedom is always the freedom of dissenters, and lived imagination is always and exclusively imagination for the one who imagines differently. Enforcing possible worlds onto non-players may liberate the latter from social conventions and help them see their environment in a new light; but a

Kantian improvement of the world by way of gameplay must reflect that universal and particularistic interests must be brought together. It would be wrong to believe that political, social, economic, communication, or game systems in place of everyday release our selves per se. These systems simply win over users, replace the conquered systems, and introduce new rules, which other possible programs then attempt to break.

The game REXplorer, which helps tourists explore the history of Regensburg, Germany, can serve as prime and temporary example of a groundbreaking game system and gameworld. In REXplorer, as described in the introduction, historical spirits are stationed at points of interest throughout the physical city of Regensburg, and players use a special "paranormal activity detector" (i.e. a device composed of a mobile phone and GPS receiver encased in a protective shell) to interact with location-based and site-specific spirits. A novel mobile interaction mechanism of "casting a spell" (i.e. making a gesture by waving the wand-like detector through the air) allows players to awaken and communicate with the spirits in order to receive and resolve quests. The game is designed to make learning history fun for tourists and to influence their path through the city.

REXplorer is a part of the Regensburg Experience (REX) museum, which is full of interactive exhibits that allow visitors to experience different aspects of the city's cultural heritage, such as medieval music and poetry. REXplorer is designed to extend the visitor experience beyond the museum walls and to showcase the most significant attraction of Regensburg, its mostly Gothic and Romanesque urban silhouette and architecture. Regensburg is a UNESCO World Heritage site and the best-preserved medieval city in Germany, mostly untouched by the widespread bombing campaigns of WWII. REXplorer changes visitors' perceptions of their destination by enabling players to narratively and physically link city sites, thus creating an interconnected mental map.

The target audience of REXplorer mainly consists of younger visitors with German language proficiency. The theme of the game is techno-magical: Visitors are asked, as scientific assistants, to examine paranormal activity recently discovered in the Regensburg medieval city center over the course of an hour. Fictional scientists, the players are told, have discovered that the phenomena are somehow linked to a child's

gravestone inscribed with a mysterious secret language shown in Figure 10. The gravestone is a real artifact in the Regensburg Cathedral, and real historians have determined that the symbols, used instead of letters, were meant to cover up the identity of the buried child, who is thought to have been the illegal offspring of a Regensburg cleric – a scandal in the 16th century!

For field research, the scientists have developed a special detector device that is able to measure paranormal activity at specific sites in the city center. The detector has artificial intelligence capabilities and is able to talk directly to the players. This makes the device a character in the game, anthropomorphically encouraging players to relate to it as a team member trying to help them achieve their goals. The detector reacts to a variety of gameplay situations including, for example, when the player idles for a longer period of time. Most importantly, the detector notifies players when they are in the vicinity of paranormal activity (and points of historical interest) through its own excited heartbeat, which serves to further emphasize its human qualities. The detector character is made even more accessible and entertaining by the voice actor who plays it in so highly expressive, excited, and often self-ironic a manner.

When near a historically significant site, players draw one of the gravestone symbols through the air as though they were casting a spell with a magic wand. Each symbol draws power from one of four medieval elements (earth, water, fire, or wind) and establishes a communication channel to the spiritual world, allowing the either historical or mythological spirits to tell their cliff-hanger stories through the device's loudspeaker. Each story challenges the players to fulfill a quest by going to a different point of interest in the city. Players need to listen carefully to the spirits in order to capture the verbal clues that indicate which gesture to use to accept a quest. When the quest is completed at another site by interacting with another spirit, the original cliff-hanger narrative is resolved, and a new quest is offered. For each completed quest, players receive points, which allow them to level up from a rookie research assistant to a master research assistant during the course of their game session.

The player's progress during a game session is tracked and used to create a personalized player blog through which the possible world of the game lives on. In short, REXplorer superimposes an informational, ludic layer upon the physical city of Regensburg.

3. Impossible Worlds

Possibility implies impossibility and vice versa. In the history of architecture, impossible worlds have fired the imagination of many designers. Impossible spaces are also representational spaces that can be found in digital games and that need not comply with the laws of the physical world. Dungeons, for example, can be located at sites where they simply could not exist if the normal rules of physics were followed. Impossible worlds are worlds that play with programmatic illusion, created, for example, perspectively.

The Sony PSP game Echochrome (2008) serves as one example of a game whose creators delighted in impossible environments. Echochrome, from the Japanese 無限回廊, meaning infinite corridor, takes advantage of the Object Locative Environment Coordinate System[23] (OLE Coordinate System), a virtual environment engine created by Jun Fujiki. In OLE, movement constraints in virtual environments are not only defined by the 3D coordinates of objects, but also by the camera's position in the gameworld. The result is that an object such as a stairway has a different meaning depending on the angle at which it is viewed. In Echochrome, the player must safely guide a lemming figure through 56 impossible world constructions that take full advantage of the possibilities of the OLE engine. The ultimate goal is to touch the shadowy figures spread out all across the level. See Figure 11.

Echochrome is clearly inspired by the works of the artist M. C. Escher. Escher's famous Waterfall lithograph, first printed in 1961, for example, is an instance of another impossible object, a Penrose triangle, or so-called tribar. The tribar's property of irregular, conflicting perspectives allows Escher to construct a waterfall that splashes into a basin, from which an aqueduct leads downhill in sharp turns, only to end up back at the top of that same waterfall and thereby create a paradox loop (Ernst 2007). Waterfall plays with our visual sense, creating uncertainty and defying the laws of geometry. The result is that we seek to problem-solve the impossible and the vertigo it entails; an impossible world, you see, is a play-ground of illusion. To better understand this type of Playground – the illusion with which we crave to dance in our everydayness – see Casino.

In an impossible world, the world itself is the puzzle; together with the player, it co-creates illusionary movement and play rhythm.

4. Body

Let us investigate examples of how the body – biologically, culturally, and as an element of an interactive system – can be viewed as a play-ground. Note that for the purposes of this book, the investigation rests on the assumption that kinesis is integral to the way we relate to the world and to others. Today, physical and computational worlds are being increasingly integrated. In light of this fact, human-computer interaction design researchers hold that the physical body plays "a central role in shaping human experience in the world, understanding the world, and interactions in the world" (Klemmer/Hartmann/Takayama (2006:1).

In cosplay, short for costume–play, people dress in costume and then dramatize and re-enact their favorite Manga comic or videogame characters. The videogames are thereby spatialized and brought to the streets (see Figure 12, which shows two cosplayers at the Tokyo Game Show 2005). Cosplay as a form of re-enactment thus belongs in the tradition of live action role-playing, which typically relies on pen and paper media for its rule base and costume as the main medium through which it is conveyed. Cosplay is particularly popular in Japan and other Asian countries, where the activity is socially acceptable. Architecturally speaking, the body in cosplay is a space covered by a costume façade, which creates a superficial fantasy similar to the Trompe l'œil. This represents one of many possible representational functions of the body as play-ground.

Our bodies and bodily functions can create enjoyment as a result of play activity that involves the body on many different levels. These levels can be roughly divided into:

- **physical play-grounds (see also Buytendijk 1933): Figure 13 shows how participants in a pervasive game workshop led by the author use the physical body to create games;**
- **emotional play-grounds (Lazzaro 2004);**
- **mental play-grounds (see the Possible Worlds entry in the inventory);**
- **sensual play-grounds.**

Let us look at examples of how body enjoyment is achieved. Traditional Chinese foot

massages – in western countries, a branch of so-called alternative medicine – belong to the last category, i.e. sensual, player-centered play-grounds. These massages can be quite painful for a first-timer, but may turn out to be a first step down the path towards better health. Many medical doctors criticize reflexology for a lack of scientific evaluation and proof of efficacy. In Switzerland, for example, only licensed medical practitioners are permitted to perform reflexology; this, it is believed, will raise and guarantee therapeutic quality on the basis of accepted medical knowledge. This is not the proper place for a thorough discussion of the medical accuracy of foot massages, however. Rather, let us look at reflexology from a game and interaction design perspective as a sensual play-ground.

In Chinese reflexology, the foot, like a Board (see Figure 14), is divided into acupuncture points and areas. By pressing the right spot, at the right angle, with the right amount of pressure, with the right finger posture, reflexologists claim that they can stimulate and unblock flows in the patient's body – because acupuncture points are Mapped to specific parts of the body – and thereby improve blood circulation or alleviate ailments like indigestion, diarrhea, or menstrual pain. Whether relief is achieved because nerve circuits are stimulated or because endorphins are released is unclear. Scientific evidence, however, suggests that reflexological techniques can reduce stress and be useful for relaxation (Natural Standard and Harvard Medical School 2005). Thus if an actuator skillfully presses the right spot, a feeling of relaxation can result. The body, in other words, has been treated like a sensual and zoned play-ground.

Similarly, in the technological project Massage Me (2007), buttons sewn into a massage jacket interpret back movements and pass these on to a videogame console as control signals: "Otherwise wasted button-pushing energy is transformed into a massage and the addicted game player becomes an inexhaustible masseur" (Perner-Wilson and Satomi 2007).

Buytendijk (1933:121ff.) describes the Liebesspiel – in English, flirtation – as the purest of all games. We would go one step further and say that flirtation involves all aspects of the body-as-play-ground. Note that the German term describes not only playful flirtation, but also the acts of mating and love-making – that is, the act of, literally, love-playing itself.

The play-ground of "loveplay" is created at the confluence of physical, emotional, mental, and sensual enjoyment, which, in western societies, often takes place in bed. The architecture of the bed is particularly fit not only for mating, but also for horizontal body programs such sleeping, dreaming, waking up, recovering, resting, giving birth, and dying. The construction of a bedroom, however, to separate the bed architecture from other spaces (and thus separate the related bed programs from other programs, such as cooking and eating) is a relatively novel housing concept that only became commonplace in the 19th and 20th centuries[24] (Dibie 1993).

The play-ground of the body and the architecture it inspires are subject to the way culture frames space. This relationship is taken to a new level when body functions such as heart rate or skin conductivity are connected to a physical space. The design technique of coupling player and environmental play-other was executed by a group of students supervised by the author, who created the biofeedback game prototype Bioplay5000, whose biofeedback hardware couples the player with computer-integrated building functionalities such as light control as well as with a camera based motion recognition system, (see http://www.building-ip.ethz.ch/education/Biofeedback as well as Walz et al. (2005)). In Bioplay5000, body and space achieve a new and intimate programmatic entity achieved via play and enabled by Technology.

In the case of the REXplorer game, the player's body and the game's play-other (i.e. the game controller) form a new kind of interactive unit in that the game uses a novel, ubiquitous mobile interaction technique of casting a spell by way of gesturing. Hummel (2000) has found that the physical movement of gesturing with the arm is more likely to create an engaging play experience than merely staying still.

In REXplorer, as has been mentioned earlier, players gesture while holding the game controller, an aluminum shell wrapped with a protective, soft, and stretchable textile that houses a Nokia N70 smartphone and a GPS receiver. The textile overlay transforms the standard phone keypad into an eight-key game interface. Players must hold down one of these buttons while performing a gesture and release it to indicate the end of the gesture. Gesture recognition is accomplished using camera-based motion estimation, as in Ballagas et al. (2005). As motion samples are collected, they are rendered on screen so that players can see their gesture progress in real time. Once

the gesture is complete, the motion trail is normalized, and the data is passed through a gesture recognition algorithm. A legend of gestures is provided in a souvenir brochure that players receive at the beginning of the game. The spell vocabulary consists of symbols inspired by a mysterious secret language from a historical artifact, a gravestone located in the Regensburg cathedral. In designing the game, we carefully selected a few relatively simple symbols whose motion vectors were as orthogonal as possible to simplify the gesture recognition process, for which we developed a specific gesture recognition algorithm.

Once we had devised the spell-casting concept, we used an iterative player-centered design process to ensure that the spell-casting input would be intuitive, enjoyable, and appropriate to the game's concept targeting tourists as well as to the game's narrative. At several stages in the design process, we conducted and video taped playability testing with several integrated prototype iterations both off and on site. These tests were followed by focus group interviews, which we used to identify patterns of behavior. Our main findings regarding the acceptance of gesture input follow:

- **Players were surprised by the high level of gesture tolerance. Aaron: "What I thought worked really well was even when you made a round 'C', the device still would recognize it – in any case, it has a really high tolerance."[25]**
- **In noisy environments, the smoothness of the gesture trace visualization from the motion data was very important to the spell-casting experience because players had preconceptions about the robustness of the recognition system. Smoothness was improved over time by, for example, employing a momentum heuristic.**
- **Because some players experienced repeated recognition failures at locations with a lot of motion noise, we introduced an alternative spell selection mechanism with a one-button interface.**
- **Older players in particular found the publicness of the gestures socially awkward. The vast majority in the target group, however, mentioned that the gestures were an important part of the experience, adding, as they did, to the sense of magic and mystery. In a focus group interview, Maria said, "We had fun with the fact that it was hard to trace out the gestures. When it works every time, then it's boring. It shouldn't be too easy."[26] _ Emotional reactions were also common when players successfully performed a gesture. During a game session, Irene commented, "Bravo...yeah!" after performing a gesture correctly.**

Ballagas/Kuntze/Walz (2008) as well as Ballagas and Walz (2007) discuss results from playability testing REXplorer in detail. The coupling of bodily gesture and game interaction, so much is clear, instantiates the play-ground that is the body.

5. "Nature"

Orienteering originated in 19th century Scandinavia as a military exercise and developed into a competitive sport around 1900. We can think of it as a predecessor to all standardized scavenger hunts and an influencer of pervasive games involving point-to-point quest solving. We can think of it, in other words, as a mix of contesting, adventuring, and problem-solving, as pure terrain kinesis.

Swedish Major and Scout leader Ernst Killander, the "father of orienteering," organized the first large-scale event in Stockholm in 1918 and continued to develop the rules of foot orienteering thereafter (Palmer 1997). Today, all Scandinavian countries host national orienteering championships, and many national and international competitions and events offer courses that vary in difficulty from beginner to advanced.

Orienteering is a physical, running-intensive game in which players read and interpret a specialized topographical Map (see Figure 15, which shows a representative map used by acquaintances of the author during a Bay Area orienteering run in 2005), use a compass to orient themselves, and choose routes in physical space in order to locate and visit a series of control points shown on their map. Whoever reaches the finish line in the shortest amount of time, checking in at the control punch stations, wins. Because the shortest path from one point to another is not necessarily the fastest, players not only compete over respective fitness levels, but also over mental skills such as navigation and map reading. In fact, the main challenge in orienteering is to navigate while running, i.e. to coordinate oneself.

Unsurprisingly, a 1997 member survey of the Bay Area Orienteering Club (BAOC) – the 4th largest organization of its kind in the US –found that among the almost 200 members who completed the questionnaire, "members' personal goals for orienteering center primarily around recreation and self-improvement, specifically (1) Become a better navigator; (2) Improve fitness; (3) Compete with self; (4) Have a nice walk in the woods" (BAOC 1997).

In orienteering, the rules of nature (or the rules of a naturalized environment) must be mastered by a player who is simultaneously rapidly moving and collecting stamps. The relationship between game and architecture in orienteering is thus a curious one because orienteering really comprises three games: one of introspection, in which the player competes against himself; a second in which the athletic contest between player and play-others is central; and, finally, a third in which the contest between player and play-ground is central – the play-ground being a dangerous natural landscape.

Even if we assume that many "natural" spaces used for orienteering have, in fact, been manually naturalized to appear as though they were untouched by man – have, in other words, become designed landscapes – we can still conclude that in orienteering, the player plays against himself and against nature's architecture. The ultimate challenge in orienteering is the annual wayfinding meeting and competition in Venice (also mentioned in the City entry). Ironically, then, the equivalent to the videogame incarnation of the bad guy, the boss-monster, in orienteering is a city, the least natural, but also the most designed of all play-grounds; even more ironically, that city is Venice, possibly the most jungle-like of all urban play-grounds.

6. Tessellation

The tessellated play-ground is pieced together by or for the player, using, for example, a collection of plane tiles of a regular shape. The use of equilateral triangles, squares, or hexagons of identical size produces a regular tessellation with the utmost symmetry, while the use of two or more different regular polygons results in a semi-regular tessellation. In both types of tessellation, every vertex must have the exact same configuration. A jigsaw puzzle, then, creates tessellation too, as it creates neither gaps nor overlaps. It is not, however, necessarily regular in strict geometrical terms, although it features recurring regular shape types. Tessellation embodies the form-function of form-functions.

Patel (2006) analyzes and compares the coordinate systems of square, regular triangle, and hexagon grids (i.e. tessellations) by considering the position of grid parts. Patel suggests an integrated coordinate (i.e. positioning) system for these simple shapes by defining nine (3*3) possible relationships between grid parts. These relationships can be expressed as algorithms from A to a list of Bs, i.e.

A B1 B2 B3

for each grid subdividing shape, describing a total of 27 algorithms. For example, the simplified form for the relationship "neighbors" is

(u,v) (u,v+1)(u+1,v)(u,v-1)(u-1,v).

Using Patel's algorithms, it is possible to quickly compute tessellations useful for gamespaces. Piecing together Lego bricks can be considered a form of three-dimensional tessellating-play, in which each Lego brick is equal to a so-called honeycomb ("Polyhedra which can be packed together periodically, to fill space exactly with no gaps, may be thought of as cells in a space-filling honeycomb" (Inchbald 1997:213)). The three-dimensional human face puzzle toy Ole Million Face, created in the 1920s by Carey Orr, an editorial cartoonist from Chicago, and later popularized in the US as Changeable Charlie (Gaston Manufacturing), is another example of three-dimensional tessellating-play.

Another more recent and exciting example of a honeycomb-like play-ground is Reinhold Wittig's dice pyramid board game Das Spiel (Edition Perlhuhn), in English, The Game (see Figure 16). Das Spiel comes with a triangular base plate and 281 four-colored dice. Das Spiel is actually a game framework, for it can be used to play many different types of building or un-building pyramid games using the dice. Whereas Das Spiel is, spatially, a limited honeycomb volume (because there is one final die on top of the pyramid), building with Lego can provide, at least theoretically, endless play.

In Board games, tile shapes are used as play pieces that are moved around on a game board. In games of chance, for example, the pieces may be used as chips, in which case the formal role the tile plays in the game (e.g. as a stand-in for money) is more important than its shape. Tile-laying can also be used to create the board of the game. In this case, the tiles have a combined functionality, serving not only as shapes or volumes used for layout and/or geometrical purposes, but also as fundamental vehicles of value (for example, as instruments of scoring or fulfilling the game objective) that can be used to dynamize the game. Three examples of tile-laying games include the board game Carcassonne, the letter-tile game Scrabble, and the board-tile-laying game THE aMAZEing LABYRINTH.

Carcassonne (Hans im Glück 2000) is a tile-laying game designed by Klaus-Jürgen Wrede; note that the very act of tile-laying is a kinesis act. In it, players start with one terrain tile and then take turns drawing a facedown terrain tile, which is then placed adjacent to the tiles already facing up. The drawn tile can only be used to extend a feature (such as a street) on an up-facing tile.

In the tile-laying word game Scrabble (Hasbro / Mattel) – originally conceived in 1931 by architect Alfred Mosher Butts as Lexico and later refined in cooperation with James Brunot, who had Scrabble trademarked in 1948 (National Scrabble Association 2008) – players draw lettered tiles to score points by forming words on a game board divided into a
15-by-15 grid.

In THE aMAZEing LABYRINTH (Ravensburger 1986), created by Max Kobbert and designed by Herbert Lentz, the player must reach treasures by traversing a board made up of movable tiles. In each turn, the player must move a row of tiles either horizontally or vertically before moving her token, thereby changing the maze of tiles to her advantage and her opponent's disadvantage.

Tessellations can be of a semantical nature as well. The OULIPO group – short for "Ouvroir de Littérature Potentielle," which translates roughly as "workshop for potential literature" – was founded in 1960 by novelist and poet Raymond Queneau together with François Le Lionnais and ten of their friends, who were committed to researching the possibilities of incorporating mathematical structures into literary works, cf. Mathews and Brotchie (1998). In Queneau's Cent Mille Milliards de Poèmes (Queneau 1961), the reader is asked to cut ten 14-line sonnets into strips; that way, he converts one poem into 1014 possible poems that he can create by combining the strips in different ways in a type of "design your own sonnet" game. Aarseth calls Queneau's experiment a "sonnet machine" (Aarseth 1997:10) and cites it as an example of ergodic literature – a work of art "that in a material sense includes the rules for its own use, a work that has certain requirements built in that automatically distinguish between successful and unsuccessful users" (1997:179). "In ergodic literature," Aarseth continues, "nontrivial effort is required to allow the reader to traverse the text" (1997:1). Queneau's sonnet machine is, to be more exact, a tessellatable text, a paper-based play-ground of narrative creation. This "low" Technology allows the narrative to unfold spatially so that it somewhat resembles the Surrealist folding paper game Cadavre Exquis (in English, Exquisite Corpse), in which a sentence or drawing is created in sequence by a number of participants who cannot see what their predecessors have contributed.

Variation can serve as a twist on this type of turn-based, sequential, chance tessellation. In his early book Exercises de style, first published in 1947 by Editions Gallimard, Queneau tells an inconsequential story in 99 different ways and 99 different styles – once as a sonnet, for example, once telegraphically, once in phonetic spelling, and so on. Inspired by Queneau, Madden (2005) adopted the notion of using one starting point to create 99 variations of a similar thing and applied it to his own medium, the comic strip. Another incarnation of tesselation, then, is the emergent meaning of tesselation.

It should by now be clear that the tessellated play-ground is dimensional, that it can have geometric, constructive, symbolic, kinetic, or combined functions, and that it can present itself in various mediums. At its core, tessellation lets us experience pattern recognition and puzzling by forming mosaic play-grounds that serve as demonstrations of perfected, i.e. utopian architectures. Consider the possibilities of such perfected architectures for urban planning, keeping in mind the wise caution of Swiss urban planner Carl Fingerhuth to interpret cities not as jigsaw puzzle tessellations with clear end-states, but as open-ended domino game tessellations instead (Fingerhuth 2004).

7. Board

The board game is the play-ground that abstracts all other physical spaces but is still a physical space in itself. The board, then, is the pan-allegorical play-ground.

Play boards come in all different shapes and sizes and are made of many different types of materials. Geometrically speaking, boards are often four-sided polygons. The most common possible board shape is the square, which has four equal side and four equal (right) angles.

Typically, a board is also subdivided into smaller and repetitive spaces, which together constitute a formal grid structure for the game, as described in Tessellation. These spaces are called tiles (Patel calls them "faces"), and each tile is enclosed by edges, or

line segments, and vertices. See Figure 17.

The grid of a game represents the game's playing terrain. Patel (2006), who gives equal attention to digital games, board games, and physical sports games in his discussion, divides grids into the following categories: maps (example: the computer game Civilization); playing surfaces (example: soccer), boards (example: chess), and abstract spaces (example: Tetris).

Beyond quadrilaterals that serve as framing structures, other important and recurring board-internal grid structures, i.e. form-functions, include:

- **the node grid: a 19x19 line grid with 361 nodes used, for example, in the game Go, in which game tokens are placed on grid nodes and vertices connect the nodes;**
- **the spiral: symbolizes the cycle of life (as in the Gänsespiel, in English, The Game of the Goose (Glonnegger 1988/1999:44ff.));**
- **the square grid: axes are orthogonal, and cells can be located using Cartesian coordinates (x, y); see also the Tessellation entry for further discussion;**
- **the triangle grid: used in 3D graphics for mappings; relatively unfamiliar in games, due, perhaps, to its large perimeter and small area;**
- **the hex grid: like other Euclidean plane uniform tilings – i.e. square and triangle – the hex grid allows for seamless structuration and full modularity. The Settlers of Catan (Kosmos 1995), created by Klaus Teuber, lets players freely construct the game world before playing. Hex grids are often used in war board games, as they allow for easier approximate distance measuring of shortest paths by way of hex cell counting (since hexes feature a small perimeter, but a large area). And because hexes have only edge-bordering neighbors, none that are connected solely via vertices, movement rules in a hex grid need not be overly complex. Of course, the hex grid features a coordinate system with two axes, but a less intuitive one than the square grid.**

Regular tiles make it possible to locate and address areas on the board and to monitor the movement and trajectories of materials from area to area. Grid taxonomies like Patel's (2006), which relate square, triangle, and hex grids to create algorithms, allow for the rapid computation of rules for the creation-board spaces. This has interesting implications for various facets of Technology, including geographic information systems (GIS), satellite-based positioning systems (such as GPS or the planned Galileo system), and positioning systems based on, for example, WLAN access point fingerprinting or GSM cell of origin or signal strength measurements (Meyer 2008). These technologies – whose accuracy depends on factors like project budget, locale invasiveness, and sustainable signal sources – render the physical world subject to mathematical and metrical analysis (Thrift 2004:588f.). With perfected physical world tessellating and positioning, the physical world can then become a game-board-like play-ground.

During the design process of REXplorer, our board game prototypes served both as demonstration tools and as a worlds-in-miniature that made easy gameplay testing possible. In fact, this form of prototype is very useful for content testing during early development stages because it allows content to be read aloud as the players progress through the game. It helps express spatiality, allows players to get a feel for travel times, oversees proximities of sights, promotes narrative consistency, and helps to ensure that the underlying game is fun. Dice and event cards can be used to regulate players' theoretical progress through the city streets, providing a more realistic simulation of the way people actually move in the city. Figure 18 shows such a board game prototype
of REXplorer.

Boards and, if they exist, board zones, imply other elements for a game to take place. Additional physical game elements – and thus, typological elements – include game pieces. These game pieces come in various forms, like, for example, pawn, peg, token, bit, mark, counter, stone, and, of course, man. They are controlled by and represent the player on the play-ground of the board, and, as such, imbue the board game with further dimensionality. In the physical world considered as a game-board, the game piece is no longer represented by a physical object, but by the player herself.

Boards themselves, of course, do not need to be flat. In the two-player board game Abalone (Abalone Games 1989) – designed by Michel Lalet and Laurent Lévi and endowed with great geometric and algorithmic appeal – a hexagonal board features 61 circular pockets in which marbles can rest. Players may push up to three marbles at a time from nest to nest, either inline – i.e. parallel to the marble – or broadside – i.e. not parallel to the marble line. Balls pushed off the nest area are out of the game, and the goal is to be the first player to eject six of the other player's balls.

In board games, then, the board, which comprises gestalt and internal spatial organization, expresses the program of the game in the following ways:

- **in terms of the magic circle, in that it clearly marks off the game from other spaces and constrains the game in this enclosed space;**
- **allegorically, in that it represents another space;**
- **contestually, in that it defines the circumstances in which the conflict is carried out;**
- **narratively, in that it provides a theme, e.g. a shape, a (graphical) premise, a figural depiction, etc.;**
- **typologically, in that it has a distinct look and feel and is made of specific materials;**
- **perspectively, in that its core components are both gestalt and imagery;**
- **functionally, in that it serves as boundary and constraint, acts as a symbol, and evokes a certain spatially induced emotion or association;**
- **technologically, in that it is constructed in a specific way with specific materials;**
- **phenomenologically, in that it expresses and assists the game site-specifically;**
- **and overall, kinetically, in the way that it allows, enforces, and restricts movement.**

To conclude this analysis, we can state that typically, a board is a necessary and sufficient condition for playing a game.

8. Cave

Both although and because it is not man-made, the cave is the ultimate and, architecturally speaking, original locale. A real cave (as opposed to its allegories – i.e. our houses and apartment blocks) is designed by elegant natural mechanisms that men cannot (yet) easily reproduce. The cave is the starting point of architecture because it is both demarcated and demarcating; in other words, because it shelters the Body. A cave demonstrates how time carves space. As architectural philosopher Otto Friedrich Bollnow puts it, "still today, the apartment is a cave in a mountain (and all the more so, as modern metropolises develop into artificial cement mountains)"[27] (Bollnow 1963:193).

In such a natural time-carved space as the cave complex in Lascaux, France, the walls tell stories. For media philosopher Vilém Flusser, the Lascaux wall paintings are decipherable, two-dimensional codes that not only reduce actual space, time, and circumstances into scenes, but also serve as maps and substitutes for circumstances both past and future. They are, in this double sense, "imaginations" (Flusser 1997:23f.); see Possible Worlds. Flusser argues that these code imaginations programmed our ancestors into "a form of magical being" (1997:24), a being made up of a set of scenes that create an imaginary world – a world of images, of allegories. With the invention of scripture, a revolution took place in this imaginary world: the image-scene was de-framed and unfurled, and its contents restructured into lines. Texts, then, derive from images, and single text symbols (i.e. letters) signify images or ideas. Because they are read in lines, texts program linear thinking (ibid.). Based on Flusser's observations, we can think of the imaginary world not only as a world void of texts, but also as a world of scenic storytelling whose walls are a spatial medium and in which the kinesis of the scene takes place not linearly, but somewhat panoptically. This, then, is a first function of a cave: to serve as a medium of spatial allegories, thereby anticipating frescos, tapestries, hangings, church windows, Baroque as well as interactive façades, and, finally, screen-based games (see the Trompe l'œil entry).

In his work The Republic[28], Plato used the cave itself as an allegory; and Plato, we know, disesteemed image-making. In his cave allegory, prisoners are chained deep inside a cave with their gazes fixed to a wall. A fire is erected behind the prisoners, and between their backs and the fire, there is a walkway along which puppet figures and objects are carried, casting shadows onto the wall at which the prisoners stare. The prisoners see only shadows, and because they attribute the sounds of the outside world to those shadows, they assume that they are watching reality unfold. One day, however, a prisoner escapes and heads out of the cave. Though blinded at first, the prisoner slowly grows accustomed to the sun and realizes that everything in the cave is an illusion; in short, he becomes enlightened. But upon returning to the cave and reporting the truth to the other prisoners, he is dismissed as having ruined eyesight. Thus according to Plato (with whom Flusser seems to agree), the cave represents an illusionary, i.e. imaginary, and cinematic space, yet in quite a negative sense:

Now the cave or den is the world of sight, the fire is the sun, the way upwards is the way to knowledge, and in the world of knowledge the idea of good is last seen and with

difficulty, but when seen is inferred to be the author of good and right--parent of the lord of light in this world, and of truth and understanding in the other (Plato, The Republic, transl. B. Jowett)[29].

Images, then, immerse us "prisoners" in an illusion, blocking true understanding. The cave is the magical play-ground for this illusionary storytelling and, by extension, mechanism of control (for those who present the prisoners with the puppet shadows are, after all, designing the prisoners' experience). No wonder that in modern theater, the audience is seated in the cavea, or audience space (see also the Theater entry). Wark (2007:002ff.) describes videogame players as the contemporary inmates of a Platonic cave, holed up in gamespace, hunched over screens, working-playing, hands compulsively jerking controllers. Yet Wark also permits the possibility of release, suggesting that we can decide if we want to be a player who is a "prisoner of work" or a gamer who enjoys the game regardless of what is at stake, but has no other choice but to play through to the end.

After their function as archetypical and contemporary[30] play-grounds of pictorial storytelling, the second function of caves is their capacity to be play-grounds of spatial adventuring and vertigo thanks to the fact that they feature a minimum of navigational complexity, eventually becoming mazes with twisty little passages, all alike (see also the inventory's Labyrinth (and Maze) entry). This is the conceptual framework through which cave and labyrinth unite.

The Mammoth Cave in southwestern Kentucky, for example, is the vantage locale and spatial base for the first computer adventure game, Colossal Cave Adventure (Crowther & Woods 1976/1977), mentioned earlier in this work. Will Crowther, an avid caver and ARPAnet developer responsible for routing protocols, put together a vector map of a section of the Mammoth Cave system, of which Colossal Cave is a part, from which he later created the game, which was then expanded by Stanford University graduate student Don Woods. In a detailed comparison of physical source cave architecture and the game architecture created by Crowther's source code, Jerz (2007) sums up his findings:

The research expedition to the real Colossal Cave in Mammoth Cave National Park confirms that the map of Will Crowther's original "Adventure" closely follows the geography of the real cave, but with fantasy and puzzle elements. The original source code shows that Crowther selectively deviated from realism; the tension between the altered geography and the mostly naturalistic text illustrates Crowther's respectful intimacy with the natural wonders of Colossal Cave. Woods added complexity and polish, with a careful eye for improving the user's experience (and, occasionally, proofreading). His contributions more than doubled the size of the original data file (from 728 lines to 1809) and more than quadrupled the size of the code file (from 709 lines to 2949). When expanding the geography, Woods improvised freely, yet his additions form an agreeable tension with Crowther's naturalistic setting (Jerz 2007:85).

Yet whereas in the original cave, the caver plays a space that encourages exploration, Adventure encourages the player to explore a labyrinthine, text-only interactive narrative via spatial adventuring and to discover a gamespace by narrative exploration. Figure 19 shows a mashup of an environmental map of a cartographed section of the actual Mammoth Cave along with a flowcharted game map of the textual space in Adventure and an excerpt of Crowther's FORTRAN code, taken from Jerz (2007:59). Note that Adventure (and, theoretically, any other computer simulation) contains forms of Impossible Worlds, that is, maze passages that would be impossible to build in the physical world. Impossible Worlds thus represent a signature difference between physically and virtually represented labyrinths and mazes.

In stark contrast to the Platonic cave, Verner Panton's cave-like architectural explorations sought to fully melt form-functions and spatial elements in order to create a kind of living space both horizontal and vertical. One lasting example of his design philosophy is the Living Tower (1968), which looks like a cross-sectional area of a cave and affords playful exploration and adventuring of architectural possibility. Similarly, Phantasy Landscape Visiona II, shown at the Cologne fair in 1970, inflates the Living Tower into a volumetric and psychedelic playscape wherein cave-dwellers explore a space-adventure (Von Vegesack and Remmele 2000). Figure 20 depicts Visiona II.

In 2007, it was again a Cologne fair where another cave-like architectural vision was first shown. Perhaps it was intended as a play on the cave allegory, perhaps as a play on Panton's Visiona II; or maybe it is simply a recognition of the fact that the cave remains a fundamental sheltering site stored in the collective mind. Whatever the motivation behind it, Zaha Hadid's Ideal House Cologne (2007), commissioned by the IMM Cologne Fair, melts walls and furniture seamlessly into a living cave both

functionally and emotionally usable[31] for its inhabitants (see Figure 21). For the Ideal House, Hadid and her team employed a design technique known as "caving in," i.e. iteratively hollowing out an original starting volume.

Both Panton and Hadid attempt to bring cave-emotion to life – Panton through adventuring, Hadid through meditating and savoring. The playfulness inherent to caves consists of more than just a capacity to narrate spatially and to spatialize narrative; through its medial gestalt and time-carvedness, it can become an environmental toy-medium in itself.

By combining storytelling elements with labyrinthine structures and the form language suggested by Panton and Hadid, the cave-toy will eventually re-emerge as a contemporary magical space. The primary design techniques that will be applied to achieve this new cave-living are theming, embedding puzzles, concealing, deceiving, interactivating,
and coupling.

An exemplary play-theming cave is the loft office of San Francisco game studio Three Rings Design, Inc., developers of Yohoho! Puzzle Pirates, a massively multiplayer online puzzle game. Three Rings' interior architecture (see Figure 22) was designed by Oakland-based firm Because We Can, who outfitted the loft to look and feel like The Nautilus from Jules Verne's 20,000 Leagues Under The Sea. In the office, you can find an attacking octopus couch, a secret lounge area hidden behind a bookcase, fake levers and electric diodes for the "engine room," and many other Victorian and steam punk-inspired elements. Most of the components were CNC cut, and all of them are non-permanent (Wired 2007).

A good example of the embedded puzzling technique is architect Eric Clough's renovation of the Fifth Avenue apartment of the Klinsky-Sherry family in New York City. Clough inserted a puzzle-based scavenger hunt into the family's 4,200-square-foot residence, which included, among other things, a clue book hidden behind paneling, ciphers on radiator covers, yielded drawers in custom-built furniture containing clue riddles, decorative door knockers–that can be removed and joined together to create a crank that opens hidden panels, and, finally, concealed puzzles such as a magnetic cube that must be pieced together to open more secret panels (Green 2008). Naturally, when it takes the form of a scavenger hunt, embedded puzzling remains a one-time event that is not repeatable. The author is quite familiar with both this lack of repeatability, and the event character of location- and puzzle-based Alternate Reality Games because in 2002, he himself conceptualized one of the pioneering games of the pervasive game genre: M.A.D. Countdown[32] (MC).

MC takes place in both the physical and virtual worlds at the Zurich School for Art and Design. In the game, players are divided into teams of five and assume the role of emergency heroes who must locate and disarm a fake but tangible atomic bomb planted as part of a conspiracy against the arts. During a day-long countdown, the rescue team must find fragments of the bomb deactivation code both in the physical world and on the virtual 6th floor of a school building. The virtual 6th floor is a two-dimensional, point-and-click, top-view world displayed on the wirelessly networked Pocket PCs with which each player is equipped. MC's treasure hunt incorporates many other media as well, including, for example, puzzle Websites, automated calls to a physical phone booth, messages on answering machines, dislocated books, and poster-sized puzzles, see Figure 23. Walz (2005) describes the game in detail.

The concealment technique, for its part, is not an architectural novelty; we can also trace it in digital games, in the form, for example, of Easter eggs, bonus stages, and secret passages. In physical architectures, a multi-purpose palette of concealment architectures would include the following:

- **curtained off, recessed alcoves (i.e. caves in a cave wall);**
- **fortified safe rooms: spaces built into residential buildings in case of threat (break-in), emergency event, or catastrophe (hurricane);**
- **secret or double (formerly, servant) passageways[33]: allow stealthy entry to and exit from a room or building or, alternatively, connect buildings (e.g. the 800 meter Passetto di Borgo, a hollow wall escape corridor that links Vatican City with the Castle of Sant'Angelo[34]); this category also includes more complex architectures of complication (see also the Labyrinth (and Maze) entry);**
- **booby traps in ancient Egyptian pyramids;**
- **traboules, passage or stairwell (tower) constructions that connect streets, often through hidden yards or via different levels; traboules can be found in a number of French cities, but mainly in Lyon.**

The design technique deception is applied in the Trompe l'œil; see the corresponding entry.

So far, the design technique interactivation exists only in conceptual form; one day, though, it will be used to enable the building structure itself to playfully interact with the dweller. The 2004/2005 master program of the CAAD group at the ETH Zurich, for example, produced an ironic film in which a protagonist enters an office building overlaid with a visual game-interface layer. The "eye" of the building then reveals that the building's structural elements are actually "playing" with the protagonist, scoring points by influencing his navigation. An automatic door shuts unexpectedly. Remote controlled furniture falls onto the protagonist's path and thus becomes an obstacle. Lights are turned off a millisecond before the protagonist reaches the switch.

Coupling can be achieved when the living-cave and the player or the player's Body become - temporarily or permanently - one system. In the prototype biofeedback game Bioplay5000, for example, we have shown how a player can control building and multimedia functionalities with his body functions. When coupled with the system we have conceived, the player can "blow out" the lights - the system recognizes the signal dip caused by heavier breathing, as well as the position of the player (cf. Walz et al. 2005).

It appears, then, that architectures capable of fully immersing the Homo Ludens Digitalis in a ludic space are just around the corner. Naturally, this raises certain questions for the future. Will the hypothetical cave-as-game-apartment reward healthy sleeping behavior? What will happen when the cave as a play-ground is combined with other play-grounds, such as Television (think the TV show Big Brother turned interactive game)? As the author noted in 2006 on his portfolio Website (http://spw.playbe.com):

As a designer, I imagine a "game generation:" People who grew playing mostly computer and videogames for all their lives, people whose prime technological and medial references consist of tools, mechanisms, and interaction patterns inherent to both entertainment experiences and the ubiquity of computing technologies. A coming "Homo Ludens Digitalis," writes game and pedagogy theorist Michael Wagner, carries with her and thus initiates a cultural shift towards a "hypermedial reading competence," where the ludofication of society has us experience media not only interactively, but, more importantly, tactically. Like McKenzie Wark – who speaks of a "military entertainment complex" – I believe that this shift is deeply political.

With the co-evolutionary advent of pervasive computing, interactive experiences (and entertainment experiences in particular) are no longer bound to sedentary or mostly screen based medial situations such as console or PC gaming. Mobile computing devices such as smartphones, sensor and actuator-rich environments and controllers, positioning services, and computer integrated environments, as well as the pervasiveness of the Internet have already begun to transform the game generation's apartments, buildings, plazas, and cities into technological playgrounds, where "appropriate design sets the stage for human experience. (...) This experience is mediated by this stage, by a place, at best" (McCullough 2004).

The art and craft of make-believe place-making challenges architects, urban planners, and game and interaction designers, and it is likely to (need to) take advantage not only of the game generation's competencies as described above, but also reflect the expectations of the Homo Ludens Digitalis, who has been trained to win not only in gamespace, but in the gamespace of the everyday.

I suspect that in the game generation's world, everyday and everywhere surveillance will become a functional consequence of these expectations. Furthermore, what I refer to as "surveiltainment," will represent a sine qua non condition – that is, a constituting and self-evident precursor of the game generation's ways of living in as well as playing with its world. A number of arguments support this assumption:

(a) ubiquitously computerized, dynamic (make-believe) places are nothing but computer based surveillance systems, even if they permit cheating or are used in ways unexpected by their designers;

(b) games, by their very nature, are surveillant, dynamic, yet intrinsically motivating learning systems. These systems always know how to reward the player and let the player seem to master the game while in fact assuring that the game masters the player;

(c) because games are, at their interactive core, about motivation and learning, and

because computers are extremely fit for processing rules (the core of games) – and thus fit for performing games – surveiltainment is the cultural consequence of computerized capitalism.

In other words: the successful application of games for so-called "serious" purposes other than entertainment by way of omnipresent technologies will entail the emergence of new forms of profit and power execution.

Interaction designer John Thackara warns and reminds us that in the context of experience services, content should be something one does, not something one is given. Pervasive game designer Jane McGonigal, then, may be right in arguing that all gameplay is performance and all performance gameplay and that ultimately, gamers aim at creating a total aesthetic experience – a social utopia, a Wagnerian "Gesamtkunstwerk."

Nonetheless I believe that in the spaces and times of the game generation, we may think that we make experiences, but it could easily be that the experiences make us – our routines, our rituals, our collective memories, our cultural repositories, and our heterotopian societies (cf. Thackara 2006, addendum spw)
(Walz 2006b).

9. Labyrinth (and Maze)

Labyrinth and maze are spatial complications of the "detour principle" (Kern 1982:13). They program a rhythmic form of swinging kinesis between player and a kind of building that may have its roots in an ancient dance choreography of the same name (1982:19). These forms have become, both architecturally and metaphorically, prominent spatial configurations in computer-based games that afford players the chance to explore gameworlds and, by adventuring, relieve the initial vertigo they cause. Whether virtual or physical, these kinesthetic configurations are architectural stages with explicitly inscribed kinetic rules, experienceable only thanks to a subject's physical or
mental Mobility.

From the architectural perspective of a player within, labyrinths and mazes are "bounded spaces to be traversed; their main purpose is to delay the walker as he goes from point A to point B" (Fernández-Vara 2007:74). Upon closer inspection, we find that there exist two fundamental constructive methods to achieve this delay:

- **The unicursal method, in which the distance between points A and B is extended by creating a path ordered in a circuitous, winding, meandering fashion. This design method generates the classical labyrinth (Kern 1982:23). Indeed, unicursal bounded spaces are called labyrinths, which, as Moles/Rohmer/Friedrich point out in a discussion of the relationship between labyrinths and graphs, are "nothing more than the expression in simple words of a behavioral graph of movements of being, an application of Graph Theory to real space" (Moles/Rohmer/Friedrich 1977:3).**
- **The multicursal method, in which (a) paths are forked so that the walker is forced to guess which path will take him to point B in the shortest amount of time, and (b) dead-ends are incorporated into the path structure. This design method generates a maze, a special type of labyrinth that was originally conceived as a literary setting and only later transformed into a visual reality (Kern 1982:23). Mazes force players to make choices – like, for example, choosing between forking paths, "the simplest figure of nonlinearity" (Aarseth 1997:91), or choosing among functionalities such as linking/jumping, "the hypertext master figure" (ibid.) so masterfully applied by Kolb (1994) in a still groundbreaking non-fiction hypertext that discussed how hypertext alters the way an argument can spatially and non-linearly unfold. In less rhetorical and literary theoretical terms, the maze, then, can be understood as a spatial device with a clear entry point and assumed exit point, featuring ambiguous and consciously disorienting paths. A maze is a building that hinders free navigation, yet like a labyrinth, renders the act of walking through it exciting.**

Put another way, "Labyrinths have many meanings. Two of them stand out: the fear of getting lost and the pleasure and challenge of exploration. These opposing meanings, not uncommon in symbols, explain partially our fascination with them" (Passini 1999). On the basis of Passini's observation, we can apply our systematics to investigate the primary functions that both configurations serve. These include: constraint, concealment, obstacle/test of skills, and, above all, exploration. Together, all these functions unite to disorient the player by defying and challenging his or her ability to comprehend a given spatial layout.

Although, as we have seen, the unicursal labyrinth creates a mild form of disorientation, it is a disorientation that often inspires quiet contemplation, if not outright meditation. A main secondary function of the labyrinth is more aesthetic: we enjoy the art and craft of the meander, the twisting of the passages, and the knowledge that we are safe in a "wild" but designed space. Labyrinths and mazes lie at the heart of architectural, urban, and game design: they are architecture's major rhetorical figure in that every single building, by virtue of its formal nature, includes a kind of labyrinth. The very formal nature of a City is labyrinthine too. It is not surprising, then, that architects have always used labyrinths as a kind of unique building signature and Map: a building's labyrinth contains an encoded description of the building's geometry as well as site-specific numeric symbolism (Hébert 2004). Perhaps the most famous example of such a labyrinthine building signature is the walkable, eleven-circuit labyrinth embedded in the floor of the Cathédrale Notre-Dame de Chartres, the soaring Gothic cathedral located in Chartres, France.

Labyrinths and mazes can be compared not only in terms their cursality (i.e. how they necessitate player choice for exploration progress), but also by determining the degree to which the functions mentioned above are present in the given labyrinth and maze play-grounds. The relationship between different mazes and labyrinths is summarized in Table 9; emerging play stimuli are cited in parenthesis.

	Unicursal Labyrinth	Multicursal Maze
Purposed disorientation function	Weaker	Stronger (vertigo)
Purposed aesthetic function	Stronger (contemplating, storytelling)	Weaker
Role of player choice for progress	Weaker	Stronger (problem-solving)
Overall player requirements	Weaker	Stronger (contesting)

Table 9

Labyrinth versus maze: A summarizing comparison.

By combining both typologies and assuming a purely constructed space (i.e. one lacking, for example, extra obstacles), we can see that the labyrinth is a play-ground best conceived as a spatial device for creating linear experiences that features some degree of disorientation, but doesn't require the player to make numerous choices in order for the game to progress (as does, for example, a narratively oriented game). A maze, on the other hand, is a play-ground for non-linear play that seeks to disorient the player and requires spatial decision-making as a necessary condition of game progress.

If additional play stimuli or functions are added to the pure labyrinth made of path and walls, active participation and choice-making become more important. Let's look at an example: the motion ride Abenteuer Atlantis (AA) – in English, Adventure Atlantis – which moves players automatically through a labyrinth. Although highly computerized, the ride will be discussed here in the general context of labyrinths (both physical and virtual) because it is highly revelatory of the prospects for the labyrinth as play-ground.

AA is an advanced interactive shooting darkride designed for families and housed in the Europa Park, one of Europe's largest theme parks. AA opened in March 2007 and is a hybrid between a darkride and a shooter game in the spirit of pioneering shooting darkrides such as Buzz Lightyear's Space Ranger Spin at Disney's Magic Kingdom theme park in Orlando, Florida.

AA takes place in an enclosed space and consists of 58 connected gondolas, each of which can accommodate two to three passengers. The basic premise is that players are embarking on an expedition to the depths of the ocean in search of the mythical city of Atlantis. The gondolas move on a looped track at a maximum speed of 0.4m/sec,

transporting up to 1,800 players/hour. With "laser harpoons," infrared light guns mounted on the gondolas, players can (repeatedly) shoot at more than 80 infrared enabled targets during their ride and thereby score up to ca. 400,000 points. Player scores are presented on the expedition vehicle's panel, as well as on a public display monitor located at the ride's exit (Ertz 2007:28f.).

High scores are recorded on the ride's Website at http://atlantis.europapark.de, where a very simple Java based shooter game lets players virtually pre- or post-experience the ride. Both the AA Web game and the AA darkride are, to borrow the words of Celia Pearce, "spatial media" (2007:201). But how is the medium of the ride spatial? A looping ride is a curvilinear, volumetric apparatus erected in space. The ride has evolved over time, coming a long way from one of its earliest incarnations, the traditional amusement park ride known as Tunnel of Love, a hideaway for young couples. The ride's historical roots can be traced back to the original meandering, linear indoor experience: the labyrinth, of course. Interpreted as a game, then, the AA ride can be viewed as a curvilinear, yet seated first-person shooter action game with limited degrees of freedom; the game is quite literally "on rails," cf. Sellers (2006:14).

In AA, the player has some range of motion, and can swirl around in her seat using a joystick mounted to the gondola's panel. She cannot, however, swirl around a full 360° or leave the gondola to explore. The special controller used for this game ride adds to the immersion experience, but the game's core stimuli are contesting stimuli, to which the player responds via the mechanics of shooting and hitting while moving continuously: because during a ride, a target out of sight is a lost target, the central challenge in AA is to aim and hit targets while being physically moved by an external engine. We can read AA as a game system manifesting itself as a conveyor belt, thereby happily merging the logic of capitalist mass production with the logic of the militaristic moving target. Rides such as AA open up a whole new world of possibility for the labyrinth and, at the same time, merge the digital game play-ground with the play-ground of the Amusement Park attraction with the help of Technology.

Labyrinths and mazes appear in all shapes and sizes across play modalities. Figure 24 shows a door lock labyrinth. Figure 25 shows the architect's signature on the floor of the cathedral in Chartres, and Figure 26 depicts a walkable maze on permanent exhibition at Stuart Landsborough's Puzzling World in New Zealand, a highly recommended walkthrough museum dedicated to Impossible Worlds. Lastly, Figure 27 shows a screenshot of the arcade hit Pac-Man (1980), displaying the game's maze that has inspired the pervasive game PacManhattan (2004).

10. Terrain

Play activity and play-ground can become temporary properties of one another via a terrain. In the summer of 2006, during the FIFA World Cup in Germany, the author was invited to Stuttgart to role-play the master of ceremonies for a soccer related performance installation created by an artist friend. The installation concept was to transform a space not originally intended for soccer gameplay into a semi-permanent soccer gamespace. The idea is reminiscent of the Situationist détournement strategy, which was discussed, for example, by Borries (2004) in reference to Nike's guerilla branding and athletic take-over of Berlin's non-sports-related locales.

Figure 28 shows how drawing a mid-sized soccer field onto a garage's concrete courtyard changes our perception of both the architecture of the garage and the game of soccer. This change was visually verified by teams of children who played a soccer tournament on the concrete "field" as part of the installation. From a window on the second floor, the author served as the performance-game's live commentator.

We, the audience – simultaneously spectators and installation components – quickly realized that any given terrain in the City could be tested to see if it was fit for field sports, even without a hired referee (again, see Figure 28). Spread the idea: Temporary magic circles in the shape of soccer fields can be created with the help of nothing more than, for example, some cardboard stencils and spray cans. All sizes – all over town! No need to build miniature wooden goals or goal nets, we can manage without. Players need only negotiate the location of the goals. The installation demonstrated how quickly a neutral terrain could become a play-ground – a lived, i.e. played, space – in the presence of players. Interestingly, the kids had been asked to "perform playing," and quickly ended up just playing without thinking of the performance any longer.

In his materialist history Skateboarding, Space and the City: Architecture and the Body, Iain Borden analyzed in great depth how skateboarders perform the city, how they engage with the terrain they choose to use, and how their body-space can only be understood in combination with the architecture they use because both are

reconstructed when one encounters the other (Borden 2001:185).

Once skaters move into the city, away from private houses, suburban roads, and skate park architectures, Borden finds that they usually prefer to skate in neglected space – i.e. space characterized by architecture that lacks meaning and symbolism, that has form, but no (longer) function. Using a term coined by Roland Barthes and Henri Lefebvre, Borden refers to these reduced, totally designed spaces as "spatial degree zero" – reduced to totally functional language, totally functional objects, totally functional spaces, totally functional time. These spaces look and feel exactly alike; monotony replicates their steps, banks, handrails, curbs, parking lots, gaps, benches, blocks, streets, roundabouts, and plazas, all of which lack individual identity. Because they are totally functional, they are ideal play-grounds. Borden argues that "the life of the city should incorporate all manner of spaces where people can gyrate, glide and rotate, mime, perform and declaim, climb, descend and traverse – that is to say, where they can act out their opinions" (Borden 2007:332). This is exactly what skaters do when they skate; by performing, they have fun and implicitly argue that motion play can fill the void of zero degree space. Figure 29 shows a map of skateboarding sites in Berlin.

Similarly, the Tony Hawk branded skateboarding videogame series – launched in 1999 with Tony Hawk's Pro Skater – lets players experience the way in which urban spaces-as-play-grounds trigger fun. At first, "topography becomes the opponent, a spatial challenge the player must overcome" (Küttler 2007:125). But the more a player learns to master the architectural challenges, the better he understands that just like in a physical skateboarding space, the architecture is not only his enemy, but also his potential ally – without it, he would not be able to perform certain gameplay tricks like grabs, flips, and lips. As Borden explains, "Our urban spaces are not there just for purposes of work, tourism, retail and other supposedly important affairs, but also for having fun, for letting go, for, in fact, being ourselves in our full range of emotions and bodily extensions" (Borden 2007:334). The difference between physical skateboarding and videogame skateboarding is that the game terrain is not designed for zero degree functionalism, but rather intentionally designed to program one hundred percent skateboarding fun. In addition, the videogame playing e-skater does not criticize a space by performing it, but rather performs the space in order to master it and optimize her experience. In videogames, the virtual activity of skateboarding becomes totally functionalized.

We all know that the activity of skateboarding may be easily misunderstood and dismissed as mere child's play. The logical extension of such dismissal, however, is the assertion that architecture must concentrate on the space of designed building-objects. This view unnecessarily limits both architectural theory and practice to a "fetishism that erases social relations and wider meanings" (Borden 2001:7).

Many examples of terrain play-grounds exist, and many more will emerge once given terrains are reinterpreted by players. In the Grand Canyon, for example, the Skywalk attraction is meant to cause delight by inducing vertigo by taking architectural advantage of the terrain. On golf courses, landscapes are sculpted masterfully for the sole purpose of making it harder for the player to sink a small ball into a similarly small hole and thereby cause delight. Parkour, a global terrain play phenomenon invented by childhood friends David Belle and Sébastien Foucan almost 20 years ago in the Paris suburbs, requires players – or so-called traceurs – to playfully challenge themselves to overcome obstacles in the built environment as rapidly and fluidly as possible, adapting their movement to the city's topographical constraints, cf. Feireiss (2007:280). Just like the skater, the traceur charges the city and its diverse restraints as though it were a physical opponent. Similarly, in several action and action-adventure videogames, the player character can perform free running moves similar to that of the traceur (or skater). See, for example, the Prince of Persia Sands of Time series (2003-2005), Free Running (2007), or the free running-inspired action-adventure game Mirror's Edge (2008), set in a seemingly utopian urban environment. The form of spatial awareness characteristic to the above-mentioned examples (e.g. skating, golf, Parkour, free running videogames) is linked to a (often near-esoteric) philosophy of fee paths, fluid movements, and smooth passages – a philosophy, in other words, of play-grounds where player and architecture unite to form a Playground of architecture.

11. Map

The term "map" is used by players of first-person shooter games[35] to describe the environment in which they play. All maps scale and virtualize the human Body (and first-hand human experience). A concrete top-down map function first appeared in the genre's classic game Doom (1993). In Doom, the player uses this so-called "automap" by pressing the tab button on the PC's keyboard, thereby switching "between the

perceptual and the conceptual modes of space" (Günzel 2007:446). When in automap mode, the player can perform a number of play actions, such as marking the current position, zooming in or out, overlapping the perceptual mode with the map view, or automatically centering the map even if his avatar is moving.

The automap demonstrates two major functions of maps in visual games: orientation and real-time strategic maneuvering in the allegorical gamespace (ibid.). Digital games, and particularly first-person shooters, allow players to act with as well as within maps by, for example, interactively mapping the gamespace by navigating through it.

More fundamentally, games – board games, videogames, pervasive games, etc. – map rules onto space, whereby gamespace is constituted, carved, or used in a certain ludic fashion because it enables a certain type of play (e.g. a flat field enables running, a stage enables role-playing, etc.). Let us look at an example of such mapping.

In the fall of 2004, the author organized a mandatory weekend excursion for his "ArchITectural Game Design" course at the University of Stuttgart, Germany. The class traveled to the St. Norbert conference and lodging center in the small village of Rot an der Rot in southern Germany. St. Norbert is a former Premonstratensian monastery that was given up by the order in 1959. It is a beautiful, Baroque building complex composed of the abbey church St. Verena, which is still in operation, the castle-like main building with picturesque towers, wide hallways, and high, stucco-adorned ceilings, and several additional annexes. Today, as in the 12th century, the remote village of Rot is dominated by the cloister and seems to constitute a sacral landscape of contemplation.

In this atmosphere of cultivated peace, students were asked to use the available classroom furniture – typical seminar space tables and chairs – and whatever other moveable items they could find to reorganize the former cloister's hallway. The goal was to prototype the space as both play-ground and map fit for a simple shoot-out game involving NERF-type plastic toy weapons. This type of game prototyping allows for physical playtesting beyond the board game, a method that, it is believed, is among the most practical and effective playtesting methods for pervasive games.

After constructing a first level, students played different kinds of shooter game sub-genres in the space, including Capture the Flag and Survivor. Fortunately, the building's layout supported these types of gameplay: the hallway stretched around a 90° corner, with one leg running a length of circa 50 meters and the other leg running circa 30 meters. The opposing teams set up headquarters at opposite ends of the hallway. We elected two referees and agreed that upon being hit with ammo, a player could be removed from her team by one of the referees, who would thus need to observe the scene closely. Play sessions ranged in time from one minute up to an exhausting ten minutes. For each session, we slightly modified the rules of play by, for example, letting players remain in the game until they had been hit three times, or by rewarding hits by letting successful players move a piece of furniture.

In each variation, and across several map iterations, the portable objects in the hallway were always tipped over so that their surfaces could be used as upright shields. In later sessions, players cut out portable Styrofoam shields to supplement the furniture protection. Throughout the course of the session, we noticed re-occurring gameplay tactics, which, as it turns out, were tactics typical of agonal competition and, more to the point, typical of battling games that feature action elements such as hitting, running, and hiding. These gameplay tactics included:

- **Self-protection and "lying in wait" (often used in third-person shooter games): The undersides of tables were used as trenches as well as safety and recovery zones. In videogames, however, players tend to dislike "lie in wait" gameplay as it results in unexpected "frags" instead of clear combatant kills. A game's level design is usually blamed and disdained for requiring "lie in wait" gameplay. In our physical game sessions, however, we found that "lying in wait" was actually an exciting game element not only because of the physical, full body tension that resulted from unexpected attacks, but also because of the back-and-forth tension that resulted from the knowledge that someone was hiding behind a shield.**
- **Path obstruction: Players used the tables in their leg of the hallway to regulate their opponents' movement in gamespace by, for example, placing objects in opponents' trajectories to slow them down or block their vision.**

Figures 30A - 30B shows the basic setup of the shorter leg of the hallway and a scene from the game in that leg (note the referee on the very left of the image).

As a device for generating, formalizing, and testing the spatial aspects of game

concepts in their early stages, this play-ground construction method proved to be fast, effectively iterative, and physically engaging. Furthermore, its physical appeal makes this type of game construction method interesting for participative design situations. Though this playtesting method is not suited for re-staging more complex situations, it can be used to scale up a situation that has only been tested in miniature form. That way, real people and physical movement can be incorporated into the testing process, which will thereby better simulate a final product.

You may perhaps be asking yourself why this example was entered into the inventory. The most obvious answer is that it provides a good example of a mapped play-ground. But beyond that, it can also help illustrate the idea of mapping as an intervention. Pre-existing spaces that at first seem unfit for gameplay can always be designated as playgrounds; the result of this renaming is impossible to predict. A former monastery, for example, may be considered inappropriate for wild, physical play, especially considering that most monastery visitors seek silence. And yet surprisingly, engaging in wild, physical play in just such a monastery proved quite a positive experience. The same seemingly inappropriate, but actually quite lovely and thought-provoking intervention occurs in the graveyard game Tombstone Hold 'Em (2005), in which players play a variation of poker in the – you guessed it – big, open, and enthralling space of a public cemetery.

With the introduction of positioning Technologies and location-based pervasive games, the mapping of rules onto spaces and the map-based interactivity described above are merging into a new kind of play-ground: mapped and map-like.

During the design process of REXplorer, maps played a number of important roles including, for example, in the prototyping of hotzones, i.e. physical zones in which the player can interact with specific game challenges. Because GPS can have problems in urban spaces due to buildings or even clouds obstructing signals from the satellites, it is very important to test a game's GPS location system thoroughly to ensure proper functionality. Our hotzones are defined iteratively based on GPS measurements and extensive play sessions. We developed a map tool (see Figure 31) that allows us to visually define the hotzones based on the GPS measurements derived during testing. Using this tool, we were able to iteratively define hotzones and to determine that GPS alone is not sufficient for the accuracy that we require. To support location detection, the REXplorer system thus also uses Bluetooth beacons, as well as providing players the ability to manually enter their locations when the location detection fails.

Maps are also used in REXplorer's souvenir brochure and blog. During the game, the player's progress is tracked. The resulting information is used to create a personalized souvenir geo-Weblog (blog). The player blog documents the player's route through space by interfacing with Google maps and through time by chronologically listing all sites and characters with which the player interacted during her session (see Figure 32). The blog provides de-briefing Web links concerning the game characters that appeared during gameplay, so that players have the opportunity to learn even more about the history of the sites they visited. During their game session, players can – and are reminded to – shoot pictures and videos of their field research. This image material (and its corresponding location information) is then automatically added to the blog as part of an interactive map.

REXplorer's game controller provides a simplified keypad interface, one of whose functions is a map button. Since the players are tourists, they generally have difficulties navigating through a foreign city. To compensate for this, we provide a physical German language tourist map in the souvenir brochure, indicating the paranormal activity sites (see Figure 33). By pressing the map button, players can also see their current position on a smaller on-screen map, as well as the destinations of all current open quests. This helps them immensely as they try to navigate through the City in order to fulfill
the quests.

12. Playground

Today, the playground is a highly regulated space built by adults for children up to the age of about twelve years. In the EU, public playground surfacing and playground equipment must comply with the detailed DIN EN 1176 and 1177 standards, which detail issues of construction, safety, and maintenance as well as the liability assumed by the playground premise owner. For example, an apparatus with a height of more than 1.50 meters requires an impact-absorbing layer of sand, fine gravel, or bark mulch[36] — at least 20 centimeters thick; playground equipment not suitable for children younger than three years of age must include an entrance safeguard mechanism; and all see-saws, swings, merry-go-rounds, spring riders, climbing

structures[37], chin-up bars, slides, and sandboxes must be checked by janitors every one to three months and by a surveyor every year. In the USA, the National Safety Council has formulated similar rules[38].

In playgrounds, playing almost always takes place under direct (i.e. legal guardian), or indirect (i.e. nanny) control conditions. Essentially, these safety precautions clarify the types of play that the playground and playground apparatus enable: risk-taking, pursuing vertigo, adventuring, and achieving.

Of course, the standards mentioned above provide security and protection for our little ones. But at the same time, standards seek to discipline the Body, as Foucault has told us time and time again; this disciplining the playground shares with the original concepts of the Kindergarten and the Campus, and has embraced the playground concept already, too. The solar powered playground exercise equipment i.play by Playdale Playgrounds Ltd[39] comes with a central LED console and switches at different heights. Children have to follow commands issued by the the console, dictating which switch to activate next; individual or group exercising and performance scores can later be entered into an i.play website. Whilst employing the collecting-based play stimuli within the context of an action competition, i.play is not only a ludic architecture in the age of ubiquitous computing and videogame-like mechanics, but also an advanced instrument of hybrid reality discipline. And yet the origin of the urban playground is not discipline, but rather the opposite.

While roundabouts and swings have existed since the pleasure gardens of the 18th century (Mumford 1961:379), urban growth and industrialization induced by capitalist logic wiped out natural playspaces, meaning play had to be taken from outdoors and relocated to densely crowded houses and apartments or over-populated streets: "Thus this paved desert, adapted primarily to wheeled traffic, became also park, promenade, a dangerous playground" (1961:427). In the face of these rapidly growing, monotonous, industrial, and condensing urbanities, a US reform movement, supported by women's rights activists such as Jane Addams, encouraged the public and municipal administrators to provide spaces that would cater to children's "insatiable desire for play" (Addams 1909:Chapter 1). In her seminal book, The Spirit of Youth and the City Streets,[40] Addams advocates public recreation, hands-on education, and artistic experience in the form of playgrounds, parks, and sports fields located within the City and aimed at healing and overcoming urban alienation and providing direction and focus. Eventually, major cities answered Addams' call, slowly but steadily erecting supervised playspaces.

It was only with the increased building of suburbia in the US that the terrain of suburban greenbelts was won back for outdoor playing. The spatial organization of public "playscapes" mirrors these illusionary naturalizations, offering experiential, modeled
terrains that incorporate vegetation and water into play, as well as, for example, log xylophones, barefoot paths, and human-scale garden chess – the latter, certainly as a means to appeal to older audiences as well. Originally intended as a play-ground of urban liberation, the playground has come to be the play-ground of secured and sealed-off play.

In the ultimate example of disciplining the body, playgrounds can become places of child work, taking advantage of children's insatiable desire for play and exploiting kinesis as kinetic energy. In 1971, in the Columbian war zone of Vichada, a number of idealistic engineers funded by the United Nations co-founded the eco-village of Gaviotas at 4°33'17"N, 70°54'55"W in an attempt to create a community of sustainable living at this very remote site. Over the years, engineers and native Guahibo Indians have come up with many innovations and inventions, among them, a children's see-saw that drives a concealed water pump. With every kinesis cycle of the see-saw– rise and descend – clean water is lifted from below ground (Weisman 1998); see Figure 34. At Gaviotas, the played liquid is a blessing; but at another site, in another context, the innate power of children may be played upon.

The play-ground that is a playground is always a reflection of its wider context. This notion is clearly evident in a novel approach to urban playground design.

At Burling Slip in Lower Manhattan near South Street Seaport – an area that has few playgrounds but is becoming increasingly attractive to residents with children – the City of New York's Department of Parks and Recreation together with "pleasure architect" David Rockwell have developed a figure-eight-shaped landscape for collaborative play. The "imagination playground"[41] (Figure 35) comprises a multi-level space with sloping ramps made out of wood that are intended for running and that connect a sand zone and water zone. Loose play elements are distributed all over

the ground: toys and tools such as foam blocks, small boats, and tubes, elbows, and gaskets for constructions, all maintained and overseen by so-called adult "play workers." The goal of this playground space – which resembles the Situationist New Babylon concept; see the Society entry in this inventory – is to encourage social, sensory, interactive, and individual fantasy play rather than limit ludic engagement to physical activity (Cardwell 2007).

13. Campus

Typically, the campus – from the Latin campus, in English, a flat expanse of land, plain, or field – is the ground on which American university buildings are built, comprising research and teaching facilities, administration buildings, student accommodation, and spaces for leisure activities such as gyms or a stadium. The campus concentrates a university's academic facilities on one site meant to embody its overall mission, thereby compacting all aspects of everyday life into an educational play-ground.

After World War II, the idea of the campus hit Europe, with many "greenfield" campuses built in the 1960s and 1970s, including the one where the author worked for some years, ETH Zurich's Hönggerberg campus.

In European urban planning, these introverted and "gated," yet economically viable campuses are currently being criticized for their lack of quality public space and their monoculture (Christiaanse 2007). Their typology, it is argued, runs counter to the efforts of many academic institutions to reintegrate themselves into the urban public realm (Hoeger 2007). One strategy to overcome this alleged remoteness is to make a campus culturally, socially, and thus architecturally attractive so that it can serve as an urban catalyst for surrounding city neighborhoods. This strategy is exemplified by the ongoing ETH Zurich Science City project, which aims to urbanize the remote ETH campus Hönggerberg and transform its buildings into a sustainable model for the university of the 21st century, adding an Information Science Center, a Sport Center, an academic guest house, student housing, as well as a learning and meeting center with an event and exhibition area, career center, and computer-integrated library (Christiaanse 2007).

Another, less construction-oriented strategy based more on computer Technology is to increase the attractiveness of campuses and thereby create a sense of connectivism. This strategy is exemplified by the game prototype ETHGame. The game was developed during the winter of 2004/05 in a design class taught by the author and his colleagues at the ETH Zurich in the Department of Architecture. In it, we supervised an interdisciplinary group of architecture and computer science students who worked together on a pervasive game prototype. The class culminated in a two-week intensive workshop and a presentation before school executives involved in strategic e-learning projects.

The ETHGame prototype game is a location-based question and answer quiz-like experience in physical space, linking mobile computing and computer-integrated buildings. The game takes place across the city-wide ETH Zurich campus, involving a virtually unlimited number of student and faculty players and about 250 wireless access points.

In the game, these access points represent interactive locations and their locative narratives. The game serves as a vehicle for transmitting and querying knowledge about the individual location's narrative. Thus, each physical location serves as a game locus and interface for the game, and the combination of locations serves as a seamless cross-campus playground. The pervasive environment of the building sites connects players and the game system.

The final game is playable on campus with any mobile or stationary computer and a valid school network account. When a player physically enters a predefined knowledge space with a mobile device, the game locus asks the player location-dependent questions concerning general and technical, discipline- and site-related topics. Figure 36 illustrates a representative application interface for the locus "Baumensa" – in English, the "cafeteria of the architectural department."

ETHGame's gameplay involves role-playing an avatar that must collect points by answering loci questions. Starting out as a "freshman," the player tries to become the one and only Nobel Prize winner by climbing the virtual hierarchy of the game. Once a player reaches the level of "professor," she keeps collecting points to ensure her victory. Only one player can win the ETHGame "Nobel Prize" by correctly answering the last question of the game. If a previous question has not been answered to a locus' satisfaction, a player must consult with another player who is already in close

proximity, and together, they must solve the puzzle. Game high scores are displayed on a public high score board. Players may also swap points for coffee discounts in the school's cafeterias.

By ascending game levels through cooperation, answering questions (together with other players), and collecting credit points, a player can win the game and be awarded the ETHGame's Nobel Prize. Once begun, the game – which is supposed to last for six weeks – could impact or at least inspire the way students and faculty work and learn, cf. Walz and Schoch (2006), who detail the design processes of the game as well as design studio didactics.

How did the campus come into being? What culture does it spatialize? Polyzoides (1997) argues that campus-making can be considered a unique contribution to urbanism in that it provides a kind of compressed urbanity, borrowing from precedents in European urbanism, particularly in the arrangement of the central city plaza, the campo (or piazza), which then described the central lawn between groups of university buildings, and later the university itself. Campus-making in the US, however, was originally inspired by and is still carried out according to what Polyzoides calls the Jeffersonian spirit:

A liberal education was viewed as a means for young Americans to defend their democratic freedoms over their life-times. In support of that goal, the campus was designed as an idealized setting: a city in the countryside or a countryside in a city. There, students were to be exposed to the civilizing powers of architecture to impart lessons of civic duty and community service. A campus education was intended to convince students of the necessity for tradition and the possibility of cultural evolution (ibid.).

Since its inception, then, the campus americanensis has served as a certain kind of cultural environment, a Societal disciplining environment in which on the one hand, alternative lifestyles can be experimented with, and on the other hand, students can be initiated into the social norms that they will later follow in a microscopic urbanity – in, that is, a Playground for young adults.

In the 1970s and 1980s, the tag-like game Assassin (also known as the Circle of Death) became widely popular in these special campus environments. In tag-style games (contemporary variants include Gotcha and Paintball), players stalk and hunt one another at all places at all times in an effort to eliminate competitors with imaginary or mock weapons so that eventually, only one surviving player remains. "Weapons" can range from NERF-type guns (see Map) to random acts of kindness, which are used in the outdoor game of benevolent assassination, Cruel 2 Be Kind[42] (McGonigal and Bogost 2006).

In 1981, Steve Jackson, a US designer of role-playing games and tactical war games, published a rulebook for these games titled, Killer. In the afterword, John William Johnson of Indiana University describes Killer as "a 'codification' of an orally transmitted folk game which has been diffusing from one [US] university campus to another for the past fifteen years" (Johnson 1981:75). Killer paved the road for live action role-playing and game design in that it standardized rules for hosting one's own game and provided guidelines and scenarios for "human hunt" style, Assassin-like live action-role-playing games. It also described a number of historical origins for such games, including Wargaming; tabletop fantasy role-playing à la Dungeons & Dragons, and the re-enactment culture in campus towns such as Berkeley, CA (Tan 2003). The Society of Creative Anachronism, founded in 1966 in Berkeley by a group of science fiction and fantasy fans, for example, is a worldwide Middle Ages re-enactment and re-creation organization whose members study and execute everyday Medieval life in everything from agriculture to cooking, dancing to gaming, leather working to medicine, poetry to pottery, weapon-making to goldsmithing, and weaving to woodworking. Medieval foot combat, however, is the organization's main attraction (SCA 2008). Johnson makes clear the way that this and similar organizations influenced Killer, and then goes on to show how Killer, in turn, influenced modern LARP (live action role-playing) culture, see the Theater entry in this inventory.

Salen and Zimmerman, investigating the relationship between the artificiality of games and their cultural environments, describe the Assassin game of the 1980s as follows: "Game play took place not only in a special, isolated game space, but in and among the activities of daily life" (Salen and Zimmerman 2004:572). Although it is clear that the authors understand "activities of daily life" as everyday campus activities, their description is misleading; it is that special, isolated, 24/7 miniature urbanity of the campus play-ground that enables all the stalking, hunting, and evading over the course of the semester.

Assassin takes the underlying ideas behind wargaming, fantasy table-tops, and combating out of the dorm rooms and onto the wider campus; and campus games are "theatrical in nontraditional but thrilling ways. Players are both actors and audience for one another" (Murray 1997:42). But Assassin-type games go even further: they take the spirit of the campus out of the city-in-a-city and into urbanities, pervading the everyday with a prank culture and the concept of joyful "killing." In contrast, the ETHGame prototype attempts to create a collaborative campus play-ground which is still agonal enough to be fun.

14. Square

In De Architectura, ancient Roman architect Vitruvius argues that because the Roman forum was traditionally used for gladiatorial games, a plaza should be built in its place to not only serve as a public communication and trading space, but also as an arena (Vitruvius Pollio 1796/2001a:201). Referencing this designerly advice, early 20th century urban planning theorist Camillo Sitte describes the Roman forum – the mother of all plazas and squares, combining Greek agora and acropolis (Mumford 1961:223) – as a kind of Theater (Sitte 1909/2001:8). In Sitte's reading, the forum is the urban equivalent of the country estate's atrium: without these, the city cannot function.

In an aesthetic criticism of 19th century European urbanism, Sitte (1909/2001)[43] proposes a square typology. At its core, Sitte suggests that we perceive a square as a room – that is, as an enclosed area, at best the heart of urban creativity. Sitte strongly opposes early modernist urban planning ideas such as ordering spaces symmetrically or orthogonally and obsessively concentrating on form and shape. Instead, he uses a psychologically informed proportional analysis of the spatial structures of ancient Italian, Austrian, and German cities and squares in relation to their monuments to show how spatial irregularity and ornament can allure us and thereby make public squares more attractive. Modernist architecture – in particular, Le Corbusier's vision of urbanizing the city as exemplified by his conceptual designs, Ville contemporaine pour trois millions d'habitants (1922) and Plan voisin pour Paris (1925) – rejected Sitte's approach in favor of clear, simple, anti-ornamental geometrical design.

The advent of postmodernist urban planning, however, helped revive Sitte's approach. In the US, Jacobs (1961) initiated a discourse about inhospitable cities, criticizing Le Corbusier's wide, garden city-like grid structures for allegedly promoting crime. Jacobs suggested that the inhospitality of US city cores and streets be overcome by taking a lesson from dense, almost congested city areas – those, that is, that have installed a system of unconscious social control through a direct juxtaposition of street level stores, parlors, and residential living spaces. In her argumentation, Jacobs takes on Sitte's very own reading of agoraphobia – in his opinion, the fear of modernist, geometrically concise squares of emptiness and ennui (Sitte 1909/2001) in which we feel unprotected and insecure. In other words, that which we could call "negative space" (Frederick 2007:6), a kind of space that does not enclose. Still, mind that even Le Corbusier's concept of placemaking attempts to create positive space, though with a different understanding of scale and regularity.

Designers of play-ground experience must first and foremost consider the type of place with which they are confronted. Is it a place that follows a functional layout logic, where, as Mies van der Rohe put it, "less is more?" Or is it a place that is irregular and ornamental, where, as architect Robert Venuri said, "less is a bore?" Just because a space seems suitable for dwelling, doesn't mean it is. Why? Because a place is socially constructed – it only comes alive through the people that inhabit it and the ways they inhabit it. Put another way, "A city's meaning is not just in its bricks and mortar, but also in our understanding and use of the information about it" (Chalmers 2004). This notion can guide the following investigation of a square as a play-ground of public Theater.

In the Tuscan city of Siena, the world-famous horse race, La Corsa del Palio – known locally simply as Il Palio – is celebrated twice during the summer. Both the Palio di Provenzano race (in honor of the Madonna di Provenzano) on July 2 and the Palio dell'Assunta race (in honor of the Madonna Assunta) on August 16 are preceded by four days of festivities and a pageant with many costumed participants called corteo storico. Both events take place on Siena's central square, the Piazza del Campo, and attract tens of thousands of spectators.

Siena, a former city-republic just like the Tuscan cities of Florence and Lucca, is the most Gothic of the three, and remains an almost flawlessly preserved UNESCO World Heritage medieval city. In fact, the tradition of Il Palio goes back to the Middle Ages, when the pugna – that is, public games between city districts, most of them combative

– were held on the Piazza del Campo. Starting in the 14th century, the contrada – non-governmental city quarter associations that (still) function as urban wards – organized pugna in the form of running races that took place publicly across the whole city; this type of pugna was called palii alla lunga. After the Tuscan duke banned the bullfighting pugna in 1516, the contrada organized the first buffalo-back races on the Piazza del Campo, which later evolved into the modern Il Palio, which first took place around 1650. For more on the fascinating history of the Sienese Palio, see the seminal scholarly work by Dundes and Falassi (2005); virtually every tourist shop in Siena carries copies of this book, now in its second edition.

For our purposes, Il Palio is interesting on three levels, which we will consider in the following order:

- **First, Il Palio represents a ludic activity and historical tradition that takes place on a city square, follows certain intrinsic rules, and takes advantage of the urban space where these rules are played out.**
- **Second, Il Palio is a spatio-symbolic game between city districts.**
- **Third, Siena is one of the wealthiest cities in Italy, boasting a particularly low crime rate and featuring the highest social capital in any city of its size in western Europe (circa 50,000 inhabitants): "Life in Siena seems ideal, like an arcadia if not even a utopia (...), and the question presents itself of what we can learn from Siena, and that means from the contrade (and, by implication, the Palio) for the organization of urban life in general in the 21st century" (Drechsler 2006:101).**

As a ludic activity, Il Palio is best described by its operational rules, which are identical for both palii. Below, I have summarized the rules as explained by Dundes and Falassi (2005) and Drechsler (2006), concentrating on the race itself, not the surrounding ludic festivity:

- **Il Palio is a bi-annual horse-racing contest thrice around the Piazza del Campo on the Piazza's outermost, steeply canted, 7.5 meter ring. Each lap is circa 300 meters.**
- **Il Palio is organized by the seventeen contrada, each representing one Sienese city quarter.**
- **Il Palio is, in contrade language, defined as "War time."**
- **In each palio, ten contrada participate, according to a rotational system and a lottery drawing.**
- **In the race, ten jockeys on ten horses each represent one of the participating contrada, wearing the appropriate contrade colors and arms. The hoses are ridden bareback, and jockeys are allowed to use a whip both for their own horse and to disturb their opponents' horses.**
- **On the starting line, there is only space for nine riders; the tenth has to stand back.**
- **When the horses are in the correct position, a local authority, called the mossiere, starts the race by removing the canapo, the starting cord.**
- **The first horse to cross the finish line with or without a rider, but with its head ornaments intact wins, and the winning rider and contrade is awarded a banner of painted silk, the palio.**

The race is ferocious and fast. Jockeys hit one another. Horses are killed or injured. The square is crammed with awe-struck spectators and competing contradaioli, ready to fight those wearing opposing colors. Like in any staging of cruelty (see Theater) or arena game (see Stadium), the public performance of daring horsemanship, mutilation, and "physical re-creation" (Drechsler 2006:115) of the contrada is spectacular. Yet, after the second palio, as the summer begins to wane, Siena again becomes an outstandingly peaceful city.

The "palio-contrade" complex, as Drechsler thoroughly shows, through contrada warding and the palii as a defined time of war, assures that Siena remains a safe city, at least on the surface. Is this the desirable urban model for the 21st century? Are games pacifying the public, and if yes: at what expense?

We can only conclude that the play-ground of the square, a center of urban life in most European cities, reflects some kind of spatial and social structuration and, because of its scale and meaning, is capable of staging and processing central conflicts. Rose (1999) points out that Il Palio is only one of many paramilitary, intramural games of Medieval origin played in Tuscan, Umbrian, and many other cities. These games often reflect the highly zoned architecture of miniature communes in the hilly urbanities where they are played, thereby fostering an intra-urban parochial mentality. Mock combats "offered a non-lethal outlet with, hopefully, a cathartic outcome as a substitute for the vendetta. Such events were preceded by impressive religious-civic

processions, formally manifesting the government's jurisdiction. Today, the direct descendants of these paramilitary games come alive each summer" (Role 1999).

Another example of such an intramural game is the Calcio Storico Fiorentino, a Medieval form of mob football revived in the 1930s and played on the Piazza della Novere in Florence. The game serves to illustrate that partisanship in today's soccer Stadium to some extent originates in urban or inter-village rivalry. The evolution of these public games between neighboring areas can also be traced in other soccer-related phenomena such as the Shrove Tuesday, an annual ludic fight between the parishes of All Saints and St. Peter's in Derby, UK (Schulze-Marmeling 2000:12).

The contrada, at least in Role's reading, remain the intracommunal, militaristic, social clubs they have been for centuries. Thus for them, organizing Il Palio also implies controlling the Arcadian life between the fanatically staged games. This, then, is what we can learn from the Palio-contrada complex for the organization of urban life in the 21st century: The institutionalization of an urban game likely entails other urban and social effects in a given Society.

15. Theater

Renaissance architect Andrea Palladio's Teatro Olimpico in Vicenza, Italy, inaugurated in 1585, is the first example of a covered, freestanding, and autonomous theatre in Europe since antiquity. Figure 37 depicts a top-view drawing of the building, showing both the audience space, or cavea, which seats around 800 people, and the separated stage. In the demarcated cavea – see the Cave entry of the inventory – the audience's gaze is fixed on the stage so that its members become passive spectators to the role-playing and storytelling action on stage. Later, the audience would also gaze at the painted scenography, which displayed the new Baroque illusionary perspective for the first time, introducing and anticipating the perspectival illusionism which later was designed onto e.g. façades in the city by the same scenographers (Mumford 1961:378). Note the startling analogy between the transferal of Baroque theatrical scenography into the city and the permeation of digital games into everyday life.

On the one hand, then, modern theater forecloses the intent of Baroque culture to please the masses by way of illusionist spectacle (see also the Trompe l'œil entry). On the other hand, and more fundamentally, the elements of the Teatro Olimpico – stage wall, three entrances (which are the platform for the painted scenes), and proscenium stage (i.e. stage portal and area between curtain and orchestra crowned by the colonnaded proscenium arch) – reconstruct the theatre of antiquity, in which the circularly seated audience is, according to Vitruvius, "immobilized by entertainment" (Vitruvius Pollio 1796/2001:210). After all, the Greek , théatron, literally means "place for viewing."

The spatial boundary between role-play-ground and savoring-play-ground hampers the to-and-fro between the two parties without preventing it. We can trace practices of overcoming the separation between actor and spectator in Denis Diderot's theoretical treatment of bourgeois tragedy from 1758, Discours sur la poésie dramatique. In it, Diderot (1994), informed by the spirit of Enlightenment, denounces theatrical stylistic devices such as a-part speaking or extempore, i.e. improvised a-part sentences, both of which are intended to break the quasi-programmed demarcation between stage and audience space in order to create kinetic possibility between actor and spectator. Diderot suggests that actors should imagine a wall at the front of the stage, separating first floor and acting area. Ever since, this imaginary but impermeable wall has been known as the fourth wall. An accompanying factor for this central concept of naturalist theatre in the proscenium theatre building can be traced in the concept of "suspension of disbelief".

The suspension of disbelief is an essential ingredient for audience enjoyment of theatrical live play as well as of other forms of entertainment. The term was first coined by poet and philosopher Samuel Taylor Coleridge in 1817[44] to describe the audience's shared willingness to imagine – in other words, accept the validity of a piece of fiction and the space it defines, even if the fiction or certain of its fictional properties are impossible or fantasy-bound (see the Impossible Worlds entry) - as long as the fiction delivers entertainment. In games, the suspension of disbelief can take on many forms. In a digital contest of tennis, a player incapable of physically playing tennis suspends disbelief when enacting a tennis player avatar and beating Swiss champion Roger Federer in a simulated tennis match. In fact, the basic allegorical character of digital games presupposes a suspension of disbelief.

The notion of breaking Diderot's fourth wall originated in Bertolt Brecht's theory of the "Epic Theater." Brecht, a German theater director, playwright, and Marxist, envisioned

an audience seated in a classical theatre building becoming aware of what it was watching, thereby emotionally distancing itself from the on-stage action and growing into a body of consciously critical observers. In order to achieve this activation effect – which Brecht called Verfremdungseffekt, in English, "estrangement effect" – actors can, for example, directly address the audience, whereby the illusion of play and hence the suspension of disbelief are destroyed for the sake of self-realization (Brecht 1964). Brecht's modernist theater embodies a deeply political and social idea of the relationship between audience and actors, and can be seen as a critique of passively consumed entertainment. This approach not only departs from the work and dramatic theory of Brecht's contemporary Constantin Stanislavski, but also stands in stark contrast to other influential theater theories such as Artaud's affective "Theatre of Cruelty," which uses violence and sexuality to put the audience in the middle of the spectacle of the play and engulf (and expose) it, thereby keeping it in an affective trance. In a certain sense, Artaud was similar to Brecht: he believed that the unprotected, almost surrealist theater experience could become a catalyst for societal transformation – a way to take full advantage of the Aristotelian concept of catharsis by addressing the unconscious chaos of the "great dark myths" (Artaud 1958:31). Brenda Laurel clarifies for us that Brechtian theater, for its part, suggests that catharsis – considered as pleasurable emotional closure in the Aristotelian sense – necessarily takes place beyond the play's ending, that is, when the experience of play becomes embedded in everyday life (Laurel 1993:121).

Brecht's Epic Theater concept suggests other, more far-reaching techniques to break the fourth wall and, by extension, to create an integrated play-ground of role-playing. The most radical technique of the Epic Theatre, the Lehrstück, or "teaching-play," was originally intended for children. In it, there is no longer any regulated boundaries between audience and actor:

The teaching-play teaches by being played, not by being seen. In principle, no spectator is necessary for a teaching-play, although one can be utilized. The underlying expectation of the teaching-play is that the players can be influenced societally by performing certain courses of behaviour, engaging certain actions, rendering certain speeches and so forth (Brecht 1967:Bd. 17:1024).[45]

Brecht's experimental-educational Lehrstück attempts to develop a theater without an audience, a theater in which players cooperatively role-play to solve dramatic conflicts. The vision of the Lehrstück can be traced in a number of contemporary theatrical modes:

- **In German-speaking countries, the field of Theaterpädagogik – in English, "theatrical pedagogy" – encompasses a set of different Lehrstück-like activities. These activities aim, for example, to bring together professional actors and acting laymen, to stage collaborative performances for corporate and leadership training, to prevent or treat the effects of personal or social conflicts, to teach and train processes, and to let players assess social relationships, learn to cooperate, analyze situations, probe attitudes, and, ultimately, solve problems. The author himself uses Brechtian Lehrstück-like techniques at several stages in his game design classes. Figure 38 shows a group of students from Tsinghua University in Beijing performing and analyzing game system procedures during a workshop taught by the author, with the topic of an Olympic Games pervasive game.**
- **Much of contemporary theatrical and performance practice plays with the intimate relationship between audience and actors, often extending that relationship beyond the theater building. These practices involve the development play-grounds on the brink of public and private space. Single audience members, for example, are brought into a direct communicative situation with actors acting solely for them; the theater situation is thus urbanized. In Fiona Templeton's pioneering city-wide theatrical piece YOU - The City from 1988 – cf. Templeton (1990) – actors are positioned at various, fixed locations in New York City.[46] One by one, each audience member makes an appointment to go to a small Manhattan office at a designated time, where he is then picked up by an actor, who takes the audience member to the next rendezvous point, where he is then handed over to the next actor. This process is repeated over and over again until the "client"/audience member ends up at a café after visiting various locations throughout New York City. YOU – The City is thus clearly reminiscent of Situationism and clearly related to our Society entry as well. As one researcher comments, "You - The City can be read in terms of what the Situationists would have called a détournement of the usual networks of communication and exchange. Whereas the Situationists had plans to replace the stairways in Piranesi's etchings with lifts and recast the street dustbins in ivory, Templeton presents a détournement of encounter" (Olsen 2001). In the afterword of her play,**

> **Templeton herself refers to this form of one-to-one intimacy as a theater that assumes and creates relationships, while simultaneously evoking privacy (Templeton 1990:139f.). The mobile phone theater piece Call-Cutta (2005), created by Berlin theater collective Rimini Protokoll, is another example of theater becoming an urban theatrical play-ground, while at the same time playing with the traditional relationship between actor and audience and making it more personal. Call-Cutta is a 60-minute neighborhood walking tour through the urban jungle of Berlin, remotely guided on a cell phone by call center employees based in Calcutta, who were trained to dramatize the experience in that they guide the audience through the telephone etc.[47]**

In another strain of performance tradition called role-played drama, participating performers are simultaneously spectators and actors. Thus, a performing player is "acting as an author in performing the character, and also acting as audience by watching other players" (Kim 2004:35), jointly realizing a fictional world and story. Still, this kind of acting, like any acting, depends on the actor's ability to consciously differentiate between an ordinary self, a pretended self, and the ensemble.

In contemporary times, this dual performer-spectator capacity is the focus of many pioneering games in the fantasy genre, the best of which is the tabletop game Dungeons & Dragons (1974). Discussing Dungeons & Dragons, Mackay argues that fantasy role-playing is a performance art, "worldly entertainment that manufactures, through a shared social experience, otherworldly playgrounds from the images of American culture" (Mackay 2001:156). Choy (2004), on the other hand, discusses how role-playing games can be interpreted and traced as a form of theater as well as a form of "framing" meaning. As an example of the former, Choy cites Augusto Boal's educational Theatre of the Oppressed (TO), which seeks to free the masses from oppression by involving them in short plays, engaging them in discussion about those plays, and then encouraging them to freely improvise[48] different versions of those plays in order to solve social problems and, in a bottom-up approach, democratize politics (2004:56ff.). TO and Brecht's Epic Theater are similar in that they hand out dramatic patterns to the performers – starting points, so to speak. Note that Choy does not point out the tremendous influence of Brecht's Epic Theatre on Boal's performance theory, though in fact, the main difference between Brecht's Epic Theatre and Boal's TO is only that the latter is supposed to take place wherever people and their conflicts take place, i.e. in schools, streets, prisons, churches, or other public spaces. TO, in other words, is not constrained to the theater building.[49]

Choy also adduces Goffman's concept of frames of meaning within which subjects perform (2004:58ff.). The "performance frame" differs from the "primary frame" (consider the words "I will kill you," which have different meaning when performed as opposed to when spoken out in a non-theatrical situation), but both are similar in that they afford participants the chance to act along "conventions of etiquette (…) to maintain engrossment of those who are participating and watching" (2004:60), the latter of which is essential to the suspension of disbelief both in the proscenium theater and in dramatic role-playing. In role-playing, this suspension of disbelief is mainly held together by a specially assigned participant role. In the tabletop fantasy role-playing game Dungeons & Dragons, the dungeon master is a selected participant who prepares game sessions, serving as storyteller, moderator, and referee, i.e. game rule interpreter.

Similarly, in live action role-playing games (LARPs), the gamemasters lay out the fictional framework of the LARP to be staged. Although LARPing modes vary widely, the duties of the role-playing gamemaster typically involve preparing and creating a consistent role-playing play-ground for players, determining the game mechanics (i.e. the verisimilitude of player actions), plotting, guiding, possibly providing goals for characters during an adventure, controlling non-playable characters throughout the LARP, and interpreting game rules in order to progress the game.

The main difference between tabletop role-playing and LARP is that in the former, "the creation of meanings is mostly verbal and predominantly symbolic" (Loponen and Montola 2004:40), whereas in the latter, the use of indices – i.e. a real sword, as opposed to, say, a card symbolizing a sword – is preferred (2004:41f.).

Still, LARPs typically use defined spatial "scenes" for role-playing. Montola and Stenros (2008:7) identify three major "design ideals" that currently guide LARP makers: (a) powerful dramas, i.e. LARPs that use scripted events and an act structure; (b) 360° illusions with perfectly crafted theatrical playspaces, which need not be realistic, but must be atmospheric; and (c) pervasive LARPing, i.e. pervasive role-playing in which players and plots actively confront everyday life in urban environments and treat

everyday objects and environments as if they belong to the diegetic fiction. As Montola notes: "The selling point of pervasive role-playing is the thrill of non-safe ordinariness combined with game invading the sphere of the ordinary. It's not all about the "this is not a game" illusion (...) allowing the players to pretend that the game is real. The attraction is in the pleasure of doing real things for real" (Montola 2007:184). This type of performative confrontation can and/or even seems to involve involuntary bystanders as well as basically everyone outside of the diegetic framework of the player (group). This last design ideal technique thus resembles Boal's drama technique of the "invisible theatre," i.e. a concealed and confrontational performance in a public space, staging, for example, sexual harassment (Boal 1992).

In Alternate Reality Games (ARGs), the spatial setting of the game becomes ambiguated (as in: "the game could be anywhere"), and puppetmasters assume roles similar to the gamemaster. Christy Dena (2007) differentiates among several design duties: setting the scene by creating game elements, making sure that players can "find" the game and access it, manually adjusting the game subsequent to player input, monitoring the game in real time, and facilitating player collaboration through storytelling and other play elements (2007:238ff.). Design duties do not, however, include making clear to the players that they are staging an unfolding play, which would represent the ultimate breaking of the fourth wall.

This breaking, which turns the spectator into a player and vice versa, is clearly evident in virtual massively multiplayer role-playing games (MMORPGs) such as World of Warcraft (2004). MMORPGs take place on clearly defined, virtual stages, and their designedness can be compared to the proscenium theatre in that it features a set of clear rules that spatially govern experience. Three-dimensional computer simulation demands a clear demarcation of the quasi-theatrical experience from everyday life. Like MMORPGs, ARGs also incorporate virtual role-playing spaces into gameplay, albeit without immersing the player in a sophisticated 3D world. Rather, typical virtual role-playing activities in ARGs include, for example, sending an e-mail to a game character.

What all these forms of dramatic role-playing have in common is the intention of merging, as seamlessly as possible, the roles of actor and audience member. They also have in common a director, who more or less strictly creates and maintains a performance frame for the players, who, in turn, maintain this pre-negotiated imaginary gameworld for themselves and for others. Indeed, Montola finds that "all role-playing is based on a power structure that governs the process of defining" (Montola 2007:178). In virtual environments such as MMORPGs, this power structure is defined and maintained by the game's rule set in combination with the digital environment and certain functional and dramatic game elements.

In certain situations, the rule set is the dominant actor. The rule set of the game prototype for Spirits of Split (the product of a 2004 game design summer school workshop supervised by the author in Split, Croatia), for example, supersedes an active puppetmaster during gameplay. In SoS, the whole city core of Split becomes the play-ground, with actors acting for, but also interacting with, spectating tourists. In the game, six locals wearing historic dress roam freely through Split's city center, overlooked by the UNESCO World Heritage site, Diocletian's Palace (see also the Castle entry). Tourists must locate the "spirits" (see Figure 39, which shows Diocletian himself!) by touring the city and exchanging keys that they have been handed at one of the booths at the palace's gates for cubes, which they receive only when they have located the "correct" spirit. The game is over once the visitors have collected all cubes. The characters (i.e. the spirits) perform little songs or pantomimes typical of the time in which they supposedly lived. Visitors are free to take the cubes home as a gift from the city. These cubes are similar to the Ole Million Face and Changeable Charlie cube toys: by turning the cube sides, tourists can puzzle together six perspectively identical images of six of Split's historical periods, including its imagined future as envisioned by its citizens.

The discussed modes of theatrical performance draw a wide-ranging picture of the theatrical play-ground. This play-ground can be presented to an inactive audience or make the audience its players; it can be organized physically and/or virtually; it can take place in a very defined space or permeate a whole city or combination of playspaces; it can be a verbal activity or involve physical enactment.

For our purposes of outlining the theatrical play-ground, it is most interesting to define it as a continuum of play that, at one extreme, strives to maintain a fourth wall between actor and audience, and at the other extreme, strives to break this wall so that ultimately, an actor-spectator figure can emerge. At the same time, the physical site of the play-ground can also vary. As noted above, it can be the defined space of

the proscenium theatre, it can be several pre-defined stations in a city, it can be any given ad-hoc location or combination of locations in a city or rural environment, or it can be any other mediated site. In the latter case, theater permeates space.

Figure 40 depicts how examples from our discussion can be plotted on a two-axis model. The resulting plot shows, for example, that the special role of the proscenium theatre in programming role-playing is similar to the special role of spatial programming in MMORPGs: both offer an enclosed, protected play-ground. This implies that taking the digital gameworld for granted is not a new quality of theatricality. In an earlier and more explicitly theater-related concept offered by Goffman, however, theatrical performance – i.e. dramaturgy – is viewed as a metaphor for everyday social life, in that we all perform "roles" (e.g. student, teacher, husband, son, etc.) on a given "stage" (e.g. kitchen, bedroom) for others (e.g. audience, observers, co-participants) using "impression management." Impression management is a dramatic effect that arises from a subject's task-driven effort to influence the audience's perception about people, objects, and/or spaces by way of social interaction. This includes facets of performative presentation such as muscular control, speech, dress code, manner, etc., becoming, in short, "a staged confidence game" (Goffman 1959:73).

What types of staged confidence games, then, do we play when we play MMORPGs? What games do we play in online social networks, in which we lay open and display our relationships for all to see, in which diaries have become public blogs for everyone to read (see the Topology entry), and in which being seen becomes a value, a form of social capital (see the Panopticon entry)?[50] What is the relationship between this form of socially accepted theatricality and the theatricality of protected, highly encoded performance stages of the digital role-playing game that reach out into the public in the form of LARPs and pervasive games? Will these strains of theatricality complement or confront one another?

16. Stadium

The stadium is an architectural solitaire; and today, stadia stand out as urban – or even national – monuments, architectural icons, or medial architectures. For Koolhaas, a stadium is XL, and the stadium's BIGNESS implies that it does not need a context. A stadium represents and functionalizes mass events. It directs the Panoptic gaze of the savoring audience (especially before the advent of Television)– towards the center of the giant, usually oval or horseshoe-shaped building.

The soccer stadium can be looked at as a curious combination of a surround theater in which seating and/or grandstands circle around a central stage or enclose this stage (Ching 1995:257). Or it can be viewed as an athletic Playground, often in the form of a flat lawn, which, as mentioned earlier, enables running and sports contests. In a more polemic reading, Peter Sloterdijk (2008) notes that in the 20th century, we have faced a double renaissance of ancient spatial forms: that of the Greek stadium and that of the Roman arena. Sloterdijk further notes that the latter prevails over the former. Let us look at both forms to understand what he means.

On the outskirts of their polity, in an ancient gymnasium, perfect and perfectly nude athletes prepared to participate in the Pan-Hellenic Olympic Games at Olympia, home of the gods, where well-oiled parties from all over Greece gathered for five days of competition devoted both religiously and culturally to "the body as the active physical expression, through disciplined play, of the human spirit" (Mumford 1961:136). For many years, the barefoot stadion race was the only discipline of the ancient Olympic Games, and the stadion runners ran towards the Olympic temple coram deis, as Sloterdijk (2008) notes. The Olympian stadion site evolved with the growth and meaning of the Olympic Games (Sinn 2004). Originally, the Olympic site consisted merely of start and finish sills, a packed earth track and grass walls for spectators on the sides.

The Olympic Games established an open play-ground of urban rivalry discharged through public athletic competitions. In architectural and appropriative contrast, the Roman arena, and particularly the architectural icon of the elliptical Roman Colosseum (a roofless oval, surrounding, that is, literally: an amphi-theatre[51]), inaugurated in 80 AC, squeezed and enclosed space into a "fatalism machine on a grand scale" (Sloterdijk 2008); see Figure 41. Fighting inside the Colosseum meant fighting for life and against death, and, at the same time, for death and against life. Aristocratic politicians sponsored inscenations of fate as a spectacle to pacify the masses and "to win prestige and public office" (Hopkins and Beard 2005:42). Still, bear in mind that the familiar larger-than-life images we conjure of the Colosseum and the performances there are heavily influenced by films and novels, and that "the performances at the Colosseum varied enormously according to the ingenuity of the presenter, the amount

of money at his disposal, the practical availability of beasts, criminals or gladiators. After all, a hundred days of spectacles with executions at lunchtime would surely have soon exhausted the supply of condemned men and women, even in a society as brutal and cruel as Rome" (2005:73). The Colosseum was, after all, a "political theatre" (2005:41), where people of the ancient Society went to be seen, to watch, to cheer, to re-enforce power, to do business, promote, arrange marriages and alliances, and to hail the emperor and the elite.

So when Koolhaas argues with the example of Manhattan's culture of congestion that "The Metropolis is an addictive machine, from which there is no escape, unless it offers that, too..." (Koolhaas 1978/1994:293), let us look, with Sloterdijk's words in the back of our heads, at the Colosseum as an addictive machine. From this machine, there was, in a definitive sense, no escape for at least one of the gladiatorial opponents who met in the arena. That the ancient Roman idea of (cruel) theatrical entertainment – optimized by Technological apparati and constructions – prevails today over the ancient Greek idea of perfect athletic competitions agreeable to the gods, can be traced in a recent essay by stadium architect Volkwin Marg.

Marg, who has built numerous soccer stadia in Europe, suggests that in the media age, soccer stadia are the stage for "commercialized gladiator games" (Marg 2008). In Marg's reading, stadia host and manage mass events, and their purpose is to stimulate vertigo not only through the overwhelming scale of the competitions they host, but also by means of the masses they can hold. In order to be successful, Marg continues, recently built soccer stadia must be cramped and steep and feature a sonic lid, creating a resonance body that amplifies the synchronous, collective, primal scream. Marg appropriately names these new incarnations of ancient Roman arenas, "hysteria bowls" (ibid.).

Other factors also help choreograph the mass experience. The arrival landscape sets a certain mood; security elements steer the stream of visitors and define how the play-ground is perceived; the areal inscenates orientation and, eventually, illuminates the scenery. Yet though the masses may appear homogenous, the logic of sports marketing dictates the programming of segregation between Super VIPs, VIPs, business customers, regular visitors, and fans in the building of professional soccer stadia for the purpose of commercialized entertainment. Taken together, this divided stadium audience then effectively plays the claqueur for the audience in front of home television sets, which demands an authentic atmosphere (ibid.). But Marg misses one important factor, the main factor for those viewers more interested in the ludic activity than anything else: Not only are different audience "ranks" segregated in the stadium, but the audience as a whole is segregated - indeed, sealed off – from the players in a segregation that resembles the demarcation between audience and actors in the proscenium Theater. That means that the audience can gaze and hear, but not play, while the players can play as well as gaze upon and hear the mass and scale of the stadium.

As in the proscenium theater, the intended hindrance between players and spectators influences audience affects. But there are other factors, too, that work on the spectator. Not only for the players, but also for the audience, the soccer contest arrogates partisanship, which is amplified by league, cup, or championship games. Furthermore, the play-ground of the stadium emotionalizes and reconditions the relationship between players, fans, and club. In combination with spectator mass and scale, the acting out of aggression can be better comprehended: In a filled arena, it is socially acceptable to at least verbally release aggression (by, for example, screaming, scolding the referee, etc.). But when we are in a stadium, we realize that this catalyst function is normalized, too – that it is part of the ritual in the stadium to behave according to the stadium code, which includes singing or collective playing (as in the La Ola-wave movement).

Whether it's a contest stadium[52] _ or spectacle arena, the heart of the soccer stadium remains, architecturally and ludically speaking, the soccer game. The literal basis of the soccer game is rules, players, ball, goals, and perhaps most fundamental, a flat green lawn – a field, really. This soccer green enables players to run and kick around a ball[53]. It can be understood as a life-size Board, demarcated into smaller spaces in order to visualize and support some rules of the game that takes place on it. The better the game, the better the impression of the stadium – and for the players, playing against the background of 80,000 cheering spectators is an impression not easy to forget.

17. Kindergarten

In the 1830s, a pedagogist and crystallographer by the name of Friedrich Fröbel (1782-1852) developed the idea of the kindergarten as a teaching system for younger children, opening the first installation of his revolutionary preschool educational framework in Blankenburg, Germany in 1837.

Fröbel, a highly spiritual and idealistic man, conceived kindergarten as a set of abstract design activities intended to reveal God's universal language of geometric perfection and natural harmony and thereby cultivate children's innate observational, reasoning, expressive, and creative abilities: "Its ultimate aim was to instill in children an understanding of what an earlier generation would have called "the music of the spheres" – the mathematically generated logic underlying the ebb and flow of creation" (Brosterman 1997:12). Many activities were incorporated into the kindergarten concept, such as gymnastics games, gardening, storytelling, singing, and group sociability training. To support these activities, Fröbel invented kindergarten materials, which he called gifts, intended to serve as play things for the children to and program them according to the kindergarten concept.

Gifts 1-6, including ball, sphere, cylinder, cube, and block, were intended to teach the kindergarten children about simple, solid bodies and their kinetic and Tessellation properties. Children were meant to "contemplate" the surface of Gift 7, parquetry. The following gifts, e.g. sticks; and drawing with a slate pencil – were dedicated to exploration of linearity, while Gift 11, punching dotted patterns into paper, was dedicated to exploration of visible points (von Mahrenholtz-Bülow 1891:269f.). The 12th Gift – an occupation, really – was sewing, often on gridded paper, and Gifts 13, 14, and 18 entailed cutting, weaving, and folding (which often included making animals and people by folding a single piece of paper, an activity recommended mostly for older children). Gifts 15-17 programmed the laying of lines or linear forms by way of slats, jointed slats, and paper strips. Gift 19, peas work, featured softened peas that served as connectors for toothpicks or small sticks that were used to create constructions. And finally, Gift 20 provides children with modeling clay, which, in a way, encompasses all previous gifts (Brosterman 1997:64-88). Figure 42 shows exercises that Fröbel suggests for Gift 1, first published in his Sonntagsblatt newspaper. To us, these exercises have the appeal of simple play kinesis, of basic to-and-fro.

The twenty gifts progress from volume to plane to line to point to line to plane and back to the beginning: solids (Gifts 19 and 20). Children could not play freely with these gifts; their use was regulated by Fröbel's Unitarianist philosophy: "In short sessions of directed play, the gifts were used to create pictures or structures that fit loosely into three fundamental categories – forms of nature (or life); forms of knowledge (or science); and forms of beauty (or art)" (Brosterman 1997:37). The dimensional wave-form drawn by the twenty gifts and the realms can all be traced in two of Fröbel's major inspirations.

On the one hand, Fröbel's design gifts were inspired by pedagogy revolutionary Johann Heinrich Pestalozzi, who, driven by a belief that the world consists of combinations of basic particles, attempted to break down nature into a language of gridded and geometric elements. He then used this ABC der Anschauung (Pestalozzi and Buss 1803) – in English, object observation lessons – to teach orphans and peasants at his school in Yverdon, Switzerland. On the other hand, Fröbel's gifts were inspired by his obsession with crystals and the four-year tenure he spent under Professor Christian Samuel Weiss, the father of modern crystallography, at the Mineralogical Museum of the University of Berlin between 1811 and 1815. At the museum, Fröbel was responsible for researching and categorizing the museum's vast collection, which eventually helped Weiss formulate his groundbreaking, mathematically precise systematics of crystalline geometry, wherein the forms of crystals are external manifestations of regularly arranged particles in three-dimensional grids.

Brosterman, in what can be called an archaeology of modernity and design functionalism, argues that many influential architects and form-givers of modernity have been "indoctrinated, in effect, programmed, by the spiritual geometry of the early kindergarten" (1997:13): Le Corbusier in Switzerland and later France; Walter Gropius and Johannes Itten at the Bauhaus in Germany; Theo van Doesburg, co-founder of De Stijl, in the Netherlands; Frank Lloyd Wright in the US; and, in a turn-of-the-century Milton, Massachusetts kindergarten, R. Buckminster Fuller, who remembers how the 19th Gift led him to the invention of triangular structures from semi-dried peas and toothpicks and, ultimately, the geodesic dome (see Brosterman (1997:84) and World).

Fröbel conceived all kindergarten activities, including the gifts, as play activities. This was the novelty of the educational kindergarten: It defined a space for play to teach

about life and nature, thereby framing play as essential to childhood development. If we accept only a portion of Brosterman's argument – that modernity and modern design and modern art have their roots in Fröbel's formal language as expressed in the kindergarten gifts – then we can further contend that major components of modernity have their roots in the play of geometrically perfected shapes.

Architecture, then, not only sets the stage for or functionally defers to gameplay; rather, architecture is fundamentally and inherently the result of calculated play with primary forms: a jeux de volume et de lumière stretching from Mass Production Housing (Le Corbusier 1928/2008:253-290) to architectural and urban planning rule sets such as those put forth in A Pattern Language (Alexander/Ishikawa/Silverstein 1977) and eventually to games such as Will Wright's SimCity (1989) or Spore (2008) or the Patterns in Game Design publication (Björk and Holopainen 2005). To borrow a phrase from game designer Jesse Schell, these are all tools "to play with patterns" (Schell 2007:402).

From this perspective, and in the words of a gamer, we can read the kindergarten as a conceptual play-ground of creation – a God-view of interlinked (cf. Topology) creation where children re-create life forms using a God view for tools and where gift exercises trigger play-stimuli and each exercise creates an allegory of the perfection of God's creation, a creation of playful movement.

18. Amusement Park

The amusement park condenses the City (or any other theme) and the pleasures of Technology into one play-ground. In its attempt to make accessible maximum entertainment on minimal ground, the amusement park always miniaturizes another space, even if that space does not yet exist. The amusement park is like a Dollhouse without macroscopic reference – it must entertain with novelty or variation, not with commonplaces. An amusement park can be a play-ground for amusing because like other public sites intended for gazing, adventuring, and contemplating, it is not only a social destination that we seldom, if ever visit by ourselves, it is also a total play-ground. As Caillois notes,

the amusement park seem[s] to be the proper domain of vertigo-inducing contraptions – machines for rotation, oscillation, suspension, and falling, constructed for the purpose of provoking visceral panic. However, all the categories of play are concurrently and seductively involved. Shooting guns or arrows are competitive games of skill in the most classic form. (...) Lotteries are everywhere. (...) Mimicry is also present. Jesters, clowns, ballerinas, and mummers parade and cavort in order to lure the public" (2001:133f.).

Amusement parks are built and attract people all over the world; people – like the author - enjoy "collecting" visits. Existing examples include the Tivoli Gardens in Copenhagen, Denmark, reportedly the world's oldest amusement park; the Prater in Vienna, Austria, with its Riesenrad Ferris wheel familiar from the movie The Third Man; Disneyland in Anaheim, CA in the USA, the park with the most franchises; Europapark in Germany, the largest park on mainland Europe; Gorky Park in Moscow, Russia; Jaya Ancol Dreamland in Jakarta, Indonesia; Blackpool Pleasure Beach in Blackpool, England; Tivoli Park in Rio de Janeiro, Brazil; and Durban Miniature Railway Park in Natal, South Africa. In Dubai, developers are currently constructing the three billion square foot Dubailand[54], a City-size urban entertainment center expected to become the world's largest tourist and entertainment destination, combining theme and water parks, gigantic shopping malls, and residential skyscrapers. Upon completion, Dubailand will integrate urbanity with the form of the amusement park, becoming the Arabian spectacle of a New Babylon that the Situationist concept of the future ludic city of New Babylon never wanted to be (see the Society entry).

At least in the USA, where amusement parks are highly commercialized, the park as an architectural form has its roots in several other historical forms, which Judith A. Adams traces in her study The American Amusement Park Industry. A History of Technology and Thrills (Adams 1991:1-40). Adams' study serves to highlight how the amusement park, that play-ground and precursor to pervasive games, emerged and was shaped:

- Medieval church-sponsored fairs and trade fairs all across Europe.
- So-called "pleasure gardens" in Europe, which emerged in the late 17th century; unlike the often chaotic and brief fairs, the gardens were available for outdoor activities throughout the warm seasons.
- Parks such as the Prater in Vienna, which opened in 1766 as a naturalized and egalitarianizing respite from urban life.
- Mechanized enjoyment machines such as the carousel and the roller coaster,

which constitute the essential and most enduring appeal of amusement parks as distinct from gardens and retreats.

- **World Expos, most notably the World's Columbian Exposition held in Chicago in 1893; this expo introduced the essential design elements of amusement parks – unity, magnitude, and illusion – as well as inaugurating many defining firsts: electricity in buildings, artificial illumination, hamburgers, picture postcards, and organizational elements such as the Midway Plaisance, alongside which amusement attractions were erected, like, for example, the newly invented Ferris Wheel, which rose 264 feet above the Midway. Figure 43 shows an image of the Midway Plaisance.**

Adams' archaeology, however, lacks a few important precursors:

- **Masquerade balls and the carnival custom, which take on myriad forms and in which masked and costumed figures play an integral role, as does the "cast" for amusement parks. For example, during the Swabian-Allemanic carnival pageants in southwestern Germany, in which the author has participated for more than ten years[55], the "fools" (i.e. reappearing characters such as the orange-clad Hansel) jump rhythmically to a marching band, slowly moving through town streets wearing wooden masks and traditional costumes with leather straps onto which cupric bells have been sewn.**
- **Public festivals such as the largest of them all, the Wiesn, or Munich Oktoberfest, which has taken place annually on the Theresienwiese since 1812, conceived as a Catholically sanctioned "time out from order, class, hierarchies, and respectability" (Herwig and Holzherr 2006:68). The Oktoberfest is flavored with extra-strong beer and orchestrated by booths, amusement attractions, and the architecture of giant beer tents wherein people are seated and equalized on wooden benches.**

Based on these examples, we can infer that the precursors to amusement parks are, fundamentally, about compaction, and that amusement parks generate a kind of synthetic, if not virtual urbanity catering to those audiences that, in their everyday lives, experience suburbanization and urban sprawl programming as opposed to European models of high density and multiple-use zoning.

In his influential book Delirious New York (1978/1994), subtitled a "retroactive manifesto for Manhattan," architect Rem Koolhaas describes how Coney Island, a former resort location and site of legendary amusement parks, grew into a "theater of architectural invention" in the late 19th and early 20th centuries (1978/1994:78) and, as such, into a vis à vis laboratory for modern Manhattan. Koolhaas' term "Manhattanism" – anticipated on Coney Island – outlines an architecture that is theatrical, synthetic, ever-in-progress, ever-illuminated, ambitious, utilitarian, polemic, megalomaniac, vertical, hyper-dense, and subject to gridiron rasterization. It is a "delirious" – we could say, vertiginous – spectacle and testing ground that, urbanistically speaking, has its roots in the competing technologies of pleasures brought forth by an "urbanism of the fantastic" (1978/1994:63) – roots, that is, in the multiple synthetic realities and pleasure zones of Coney Island, including, among others, Steeplechase Park, Dreamland, and Luna Park. In a seconding account of their impact, we read that "the air crackled with electricity. The masses (...) went to amusement parks to try out modern track-systems and novel constructions; the latest in amusement became a test bed for modernity" (Herwig and Holzherr 2006:62). In the guise of entertainment rides and pleasures, the Coney Island pleasure zones and zone visitors together conducted mass experiments in, for example, velocity, automation, horizontal and vertical (elevator) transportation, electrification, and vertical building and experiencing. Experimentation also included simulation – a trip to the moon was offered (see also the Castle entry) and a vast indoor model of the canals of Venice was set up (see the City entry) – as well as miniaturization – a "midget city" was erected (see the Dollhouse entry). In the Dr. Couney's Infant Incubator building, premature babies were publicly saved (Koolhaas 1978/1994:46ff.).

Coney Island, we learn, was, at first, a US play-ground. In the beginning, it attracted tens of thousands; then, in the 1920s, one million or more per weekend. This success eventually led to the spawning of Luna Parks all over Europe as well. These parks lost their audiences only in the 1940s due to the advent of Television programming and mass tourism (Blume 2001:44). Still, pleasure and architectural concepts from Coney Island live on even today in the Casino town of Las Vegas and in Folly and symbolizing architecture, which Venturi/Scott Brown/Izenour described so vehemently in their criticism of the symbolistic and zoomorphic building gestalt of the "Duck" (1977:17).

While Koolhaas (1978/1994) encourages us to think of amusement parks as miniature cities, Gingold (2003) encourages us to think of digital games as miniature garden spaces – an analogy derived from Shigeru Miyamoto, Japanese game designer/producer

of milestone videogames such as Super Mario Bros. (1985), and an analogy that points out the affinity between amusement parks (as pleasure gardens) and games:

A garden has an inner life of its own; it is a world in flux which grows and changes. A garden's internal behaviors, and how we understand those rules, help us to wrap our heads and hands around the garden. The intricate spaces and living systems of a garden surprise, delight, and invite participation. Gardens, like games, are compact, self-sustained worlds we can immerse ourselves in. Japanese gardens often contain a multiplicity of environments and places, such as mountains, oceans, or forests that we can look at, walk around, or interact with. Gardens are a way to think about the aesthetic, cognitive, and representational aspects of game space (Gingold 2003:7).

Celia Pearce (2007) merges both models, arguing that digital games resemble theme parks, yet neither references Koolhaas nor points at the garden analogy suggested by Gingold. In Pearce's view, Disneyland in Anaheim, CA came into existence to fill an ahistorical, i.e. narrative and folkloristic vacuum that pervades southern California in contrast to Europe, where inhabitants are immersed in the three-dimensional narrative structures of the European City, made up historically of castles and cathedrals (2007:201). In particular, Pearce parallels theme parks and graphically based massively multiplayer online games (MMOGs): both types of locales, she argues, are public places that simultaneously offer entertainment and attract thousands of people. Both are themed, with the vast majority of major MMOGs based, more or less, on the sword and sorcery role-playing game Dungeons & Dragons (1974) and motifs from J.R.R. Tolkien's secondary fantasy worlds. Similar to amusement park precursors such as Renaissance fairs, and dissimilar from the Disneyland scheme, MMOGs demand that players role-play and thus fully break the "fourth wall" (see the Theater entry for further elaboration).

Whether zoned garden or spatial narrative, the play-ground of the amusement park can be analyzed from a game design perspective as an agglomeration of play pleasures similar to the game design figure of a tournament. In such a space, visitors usually deal with a succession of railed entertainment: "In environments based on the amusement park model, the story and the visit can be tightly meshed" (Murray 1997:109). From an architectural perspective, at least the American amusement park can be taken as an attempt to produce a congested storytelling fantasy by way of Technology: "Americans, after all, never had real castles (...)" (Dunlop 1996:104) to program "a place of warmth and nostalgia, of illusion and color and delight" (1994:25). Or so, at least, thought Walt Disney in a romanticized reading of history and present. The amusement park, then, is a play-ground of imposed, hard-railed transfiguration.

19. Panopticon

Panopticon is a Greek word that means all-seeing and is the name that British philosopher and utilitarian theorist Jeremy Bentham (1748-1832) chose for a completely new, ideal prison meant to be erected in an urban context. Bentham presented this vision to the public in numerous drafts, offering a perfected architectural model in 1791 with his General Idea of a Penitentiary Panopticon (Kaschat 2002:114f.). Figure 44 visualizes this late Panopticon structure with six stories, designed to hold circa 460 prisoners, with each windowed cell in the outer circle (A) confining several inmates. (D,O,F) show connecting corridors and wells, followed by a chapel on the inner circle (M,G) and the director's watchtower in the middle (N). As Foucault explains, "The Panopticon is a machine for dissociating the see/being seen dyad: in the peripheral ring, one is totally seen, without ever seeing; in the central tower, one sees everything without ever being seen" (Foucault 1997:362).

This power of the gaze is institutionalized in the Panopticon. Thanks to the architecture, a single party can conduct absolute surveillance of everything taking place within the building. The Panopticon is an architectural machine that creates and sustains power: prisoners always see the tall and central tower from which they are intermittently observed, but don't know when they are being watched, so must assume that it is always. The result, Foucault explains, is "To induce in the inmate a state of conscious and permanent visibility that assures the automatic functioning of power" (Foucault 1997:361). Bentham's Panopticon has inspired designs for buildings varying from asylum to hospital to, of course, prison, but has never proved sustainable. And yet, the concept itself has sustained thanks to Foucault's in-depth analysis of disciplinary control (Foucault 1997) as a synonym for a society of surveillance that impacts both public and private life.

The entertainment industry, Peter Weibel briefly notes, does not consider the panoptic principle a threat or a punishment, "but, rather, as amusement, liberation and pleasure" (Weibel 2002:215). And in a mediatized world governed by images, reality

Television shows such as Big Brother (Endemol Entertainment 1999), in which a group of people live together in a "container" TV studio apartment and are recorded 24/7 by cameras, provide "the pleasure of power, the pleasures of sadism, voyeurism, exhibitionism, scopophilia [the love of looking], and narcissism" (ibid.).

The London neighborhood Shoreditch has created a mechanism that caters to those very pleasures. There, residents can tune into a TV channel to watch content from cameras installed in Shoreditch public spaces. The service allows residents "to see what's happening, check out the traffic and keep an eye out for crime" (Digital Bridge 2006). The latter is of particular interest when considering the "crime channel Shoreditch TV" and Shoreditch itself as a play-ground in the form of a panopticon. Shoreditch TV is a public closed circuit television program (CCTV) intended, implicitly, to convince neighborhood inhabitants that public CCTV can assure social control. At its core, however, Shoreditch TV inscenates the power of gaze as entertainment in a true-life version of the movie The Truman Show, in which the protagonist eventually escapes the OmniCam Ecosphere, where the reality TV show that he unknowingly inhabits takes place (Paramount Pictures 1998).

Rolf Nohr (2007) considers the movie as though it were a game: "The Truman Show anticipates the computer game The Sims (2000) and thematizes the closed and fully controlled space of life-simulation on the basis of a normative canon of values and consumerist strategies for success. Like The Sims, The Truman Show represents the declension of a neoliberal urbanistic space" (Nohr 2007:470).

Michel de Certeau, in The Practice of Everyday Life (de Certeau 1984), proposes countering such totalizing tele-views – i.e. perspectives from above and afar that seek to control space – with individual everyday spatial design practices from below intended to break conformity. De Certeau offers some examples of such practices: tactical activities such as the altering of maps or city street objects, the inventing of lost and legendary spaces, and the encouraging of conscious choice and customization of goods so that the consumer becomes a producer. Indeed, in a mediatized age, there are many interesting forms of playful counter-surveillance available:

- **New York City based performance activists and Situationist pranksters, The Surveillance Camera Players perform Theater plays in front of public surveillance cameras.**
- **Mann (2003), criticizing an over-surveilled Society, describes methods of sousveillance, i.e. inverting surveillance, by bringing the power of gaze down below, to a human level – somewhat in the tradition of the Situationist détournement performances. An example can be seen on Figure 45, which shows a variety of everyday sousveillance infrared and video camera objects.**

The panoptic play-ground caters to those who find pleasure in exhibiting and those who desire to show. Those who seek to protect their privacy can overcome surveiltainment by creating sousveiltainment, thereby ironically (re-)creating consumer-created surveiltainment.

20. Trompe l'œil

During the Baroque period, which originated in Italy in the early 17th century, artistic methods to deceive the eye were developed with the goal of establishing an aesthetic of the virtual that tended to invade space in every direction (Bal 2001). Combining multiple, shifting points of view and narrative perspectives, the Baroque was different from classical systems in its "refusal to respect the limits of the frame" (Ndalianis 2000). Because of this refusal, the viewer is situated into a spatial relationship to the representation. Consequently, Gilles Deleuze proposes the term "architecture of vision" (Deleuze 1993:21) as the best way to paraphrase the Baroque approach to building. Similarly, Lewis Mumford describes how the city planners of the Baroque – Servandoni, Inigo, Jones, Bernini – were primarily scenic designers who created theatrical backdrops for the inscenenation of power using designerly means like overscaling, ornamenting, and disguising, and, first and foremost, created a City culture of pleasure for the masses by way of monumental façades on grandiose palaces, pleasure gardens with swings and roundabouts, the Bal masqué, and anatomy dissections as public performances conducted in public "theaters" (Mumford 1961:378f.). Here, too, we can identify certain play types: pursuing vertigo, role-playing, savoring, and gazing.

The trompe l'œil – French for "trick the eye" – is one artistic technique particularly representative of this Baroque urban pleasure culture based on the architecture of vision. The trompe l'œil was perfected in probably its most immersive form, the quadratura, which virtually extended the existing physical architecture ad infinitum. One good example of a masterpiece of quadratura – and of High Roman Baroque

technique in general – is Father Andrea Pozzo's breathtaking nave ceiling of the church Sant'Ignazio in Rome. Painted between 1691 and 1694, the fresco depicts an allegory of the apotheosis of St. Ignatius and the missionary work of the Jesuit order stretched across a circle with a 17 meter diameter. The ceiling is flat, but thanks to Pozzo's use of perspectival projection, a trompe l'œil effect is achieved whereby a viewer, standing at an ideal spot marked by a yellow marble disc in the floor, experiences an illusion of infinite depth. Looking up at the Theatrical, lofty cupola [Figure 46], he sees angels floating upward towards the open and bright sky, orchestrating St. Ignatius' entrance into paradise so that "It is almost impossible to tell where the real architecture ends and the faux begins. Here, the subtle techniques of perspective make possible the illusion of a virtual reality which seems to blend seamlessly into the physical space of the church – one has the feeling of really "being there" beneath that angel-filled sky" (Wertheim 2000:111). Also see Impossible Worlds.

Not only trompe l'œil frescoes, but the trompe l'œil in general as a Technology of visual representation challenge the Albertian fixed-point perspective construction, named after Renaissance architect, humanist, and writer Leon Battista Alberti.

Alberti's 1435/36 work Della Pittura can be considered the first modern treatise on the theory of painting. In Della Pittura[56], Alberti proposes the mathematical construction and framing of painted space as a way "to control the space which man is to inhabit both as an actor and observer" (Spencer 1970). In contrast, the illusion of infinite spatial extension into impossible realms as exemplified by Pozzo's piece of art manifests the allegory as the central designerly and spatial trope of the Baroque. It is the allegory as a central spatial feature that ties trompe l'œil to computer games, the latter of which we can analyze as playable illusions (Aarseth 2007).

In fact, it has been argued that like the allegorical spatiality evoked by trompes l'œil, 21st century entertainment forms such as Amusement Park attractions are also intended to break down the spatial barriers between the space of the representation and the space of the audience: "One space extends into another, one medium into the next, the spectator into the spectacle, and the spectacle into the spectator. Extending the Baroque spatial dimension of sight, this Baroque attraction employs multi-media technologies to produce virtual trompe l'œil effects that call into play all the senses. Introducing motion, sound, and other sensorial encounters to visual spectacle, the contemporary Baroque articulates the perceptual collapse of the frame more powerfully, and in ways not witnessed before" (Ndalianis 2000). The same holds true of pervasive games such as REXplorer.

When we walk, take the subway, or drive through the streets, undergrounds, and squares of Zurich, Berlin, London, New York, Seoul, Beijing, or Tokyo's Ginza, urban trompes l'œil meet our eyes in the form of billboards, large public LCD displays and interactive façades. Many of the interaction possibilities between these new urban forms and the passers-by who see them have not yet been researched. Outstanding projects that redefine this relationship include the Chaos Computer Club's Blinkenlights installation in Berlin in 2001. Using 144 building emitters, Blinkenlights morphed the windows of the "House of Teachers" high-rise at Alexanderplatz into "pixels," which were then used to display messages and animations on the building with the help of PC software. In addition, Blinkenlights enabled observers to play a gigantic version of PONG (1972) by using the keypad on their cell phones to control a virtual ball (Willhardt 2007:396f.).

It is not only the entertainment or game spectacle that seeks "to obliterate the frame that demarcates a distance between reality and representation" (Ndalianis 2000). In the future, that will increasingly become the goal of our media-enabled architectures as well of our hunger for illusion. The illusionistic stance of the trompe l'œil and its conceptual successors goes well beyond Le Corbusier's ludically inclined, but nevertheless narrowing assumption that "paintings are made for meditation" (Le Corbusier 1928/2008:170).

21. Television

In 1977, Thomas Gottschalk, today one of Germany's most famous TV hosts, began moderating the new TV show Telespiele, which made him famous nationwide. (Note that Telespiele is a German term for early console games, translating quite literally to "tele games.") The show ran for a total of almost 30 episodes until 1981, turning into one of the most popular evening programs. In fact, Telespiele was both the defining TV experience and one of the defining game experiences of the early game generation – a first glimpse into the possibility of mediated Panopticon games.

Telespiele was a truly unique and groundbreaking TV program not only for its time but

also in general. The show consisted of contestants playing videogames against one another in the TV studio, using a large public display and idiosyncratic controllers such as punching balls. The highlight of the show, however, was an entirely different gameplay experience: a call-in candidate would play a game clone of PONG against Gottschalk or against a studio candidate, with the players using their voices to control and change the bat's y-axis position by making sounds or remaining silent (which returned the bat to (0,0)). Hence the somewhat confusing, yet amusing game claim: "Eine Telefondiskothek mit Thomas Gottschalk," in English, "A telephone discotheque with Thomas Gottschalk." The call-in contestant would use her TV set as a display and had the chance of winning a videogame or choosing between a pre-recorded sketch or a live band performance. Although questionable from a design standpoint – players often failed to hit the ball at all, and very few to-and-fros, i.e. ball cycles, took place – the PONG-like game in Telespiele marked the dawn of pervasive games. Through an interactive game and diverse media, a relational network between a set of rather diverse spaces and actions was established, thereby creating a coherent gamespace that comprised:

- **the players (phone-in contestant and show host);**
- **the other TV studio contestants (now viewing the action) as well as the TV studio audience;**
- **the physical location of the TV studio;**
- **the physical location of the call-in candidate;**
- **the physical and mediated objects used by the players to engage with the game (phone, TV display, interface, controllers, etc.);**
- **the physical locations of all viewers (including my parent's living room);**
- **the objects used by all viewers (including my parents and me) to experience the show (TV and, potentially, phone);**
- **the object-bound mediation of players, candidates, audience, their locations, their objects-in-use and their interactions via the TV.**

Quite a complex setup in which the physical and the virtual interrelate, and spaces and objects take on several roles, both virtual and physical, to enable the player as well as the audience experience. The key role in this setup, however, is that of the architecture of the game, where architecture describes the processes, uses, and performances – in short, the production of space, time, and sociability – that took place during a Telespiele show.

In classical tele-games, savoring still is a major mode of experience, in no small part because real-time audience interaction is not easily produced in TV shows. And yet if we assume classical TV delivery (TV set at home with a cable box placed on top), we can think of many interesting models for novel interactive TV games designed according to the following lines of exemplary continua (note that some modes may be mutually exclusive):

- **Participants: Cast – TV audience.**
- **Participation: Savoring – Active participation.**
- **Commentary: Program created – Audience created (and judged).**
- **Programming: Live – Preshot.**
- **Input channel: Remote control – Multiple devices (phone or other).**
- **Input transmission (i.e. how many players does it take to effect an output): Single player – Accumulated Players.**
- **Game opponent: Game system – Other player(s).**
- **Game feedback: Continuous (i.e. real-time) – Discrete (i.e. asynchronous).**
- **Player location: Televised (TV studio or alternate location) – TV audience.**
- **Output location: Televised – Personalized (e-mail, IRQ, phone).**
- **Game progress: Intra-Show – Inter-Show.**
- **Content fabric: TV show – Cross-media experience.**

Television can also extend its reach and interaction possibility when coupled with other media through Technology, thereby creating new play-grounds.

22. Folly

The architectural, physiognomic, or zoomorphic – in any case: hyper-real – folly is the play-ground of symbolic savoring and, sometimes, inhabitation. Venturi/Scott Brown/Izenour reject it as brutal: "It is all right to decorate construction but never construct decoration" (1977:163). Figure 47 shows an example of such decorative symbolistic space, a sketch of Charles-François Ribart's L'Elephant Triomphal, Grande Kiosque à la Gloire du Roi from 1758.

Ribart suggested the construction of this three-level piece of zoomorphic architecture

as an addition to the Champs-Elysée in Paris, where the Arc de Triomphe stands today. The French government turned down the proposal. Over 120 years later, however, on the other side of the Atlantic, the U.S. Patent Office granted James V. Lafferty a patent for the design of animal-shaped buildings in 1882. That same year, Lafferty constructed the Elephant Bazaar, later dubbed "Lucy the Elephant," a six-story elephant that eventually became a National Historic Landmark in the 1970s, after it had already been moved from its original site in Atlantic City. Both Ribart's and Lafferty's elephants are architectural "follies." We can find these often neglected buildings in English parks, at World Expos, or in an Amusement Park, usually as (tourist) attractors, landmarks and/or orientation and navigation "pins."

In the strictest sense, though, Lucy the Elephant cannot be called a folly; since its erection, the building has served as a restaurant, a business office, a cottage, and a tavern. The building, in other words, has various practical uses. Even though follies have no building purpose other than pure spatial entertainment, they nonetheless serve spatial functions for the area where they have been erected. As such, follies fall under the category of attractor architecture.

In the landmark study Learning from Las Vegas. The Forgotten Symbolism of Architectural Form, Venturi/Brown/Izenour harshly reject the idea of the "sculptural duck" (Venturi/Brown/Izenour 1977:130) as a self-aggrandizing monument, inappropriate for the scale of environments subject to (auto)mobility, speed, and traveling: "The iconography and mixed media of roadside commercial architecture will point the way, if we will look" (1977:131). In their time, Venturi/Brown/Izenour identified the decorated shed and the "ugly and ordinary" as ways to overcome what they believed were Modern architecture's great mistake – namely, the promotion of space and articulation over symbolism and ornament. The result, Venturi/Brown/Izenour believed, was the "designing [of] dead ducks" (1977:162).

Entertainment Castles can feature stylistic tradition or at least raise historical awareness and still clearly serve an aesthetic function. In the spirit of Walt Disney's attempt to create a miniature replica of the world in the form of a park where landmarks from other places could be wondered at, Mickey's Magic Castle clearly resembles the Neuschwanstein folly castle in southern Bavaria, commissioned by Bavarian king Ludwig II in 1868 and still today one of the most popular tourist attractions in Germany. Yet there is a difference between the two castles: namely, tourists can wander the halls of Neuschwanstein. Visiting a non-navigable folly architecture like Mickey's Magic Castle, on the other hand, only serves the savoring play stimulus. And in order for a building environment to become more involved in the play activity it hosts, the building should feature traversability, thereby allowing for player Mobility.

Follies are curious, expressive architectures that can add flavor to a game's mise-en-scène.

23. Dollhouse

The dollhouse is an abstracted miniature Cave affording directing; it turns domesticity into a spatial toy, and a spatial toy into a home. Long before the invention of the computer generated god view perspective or the digital god game genre, the "director" of the original dollhouse took on a god view of his physical Sims-like dolls, which he role-played in order to storytell. Claus Hansmann and Leonie von Wilckens (1959) state – and we agree – that dollhouses are, beyond being play stimuli, scaled down mirrors of the everyday. So if dollhouses became widespread ludic devices during the early 19th century Biedermeier era in Europa, because they were intended to program girls for their later role as a housewife, what does today's ludic device, The Sims, program?

Will Wright, main creator of The Sims, has called the game "a computerized dollhouse" (Hattori 2000) "for understanding not only our personalities, but also our personal spaces" (Thompson 2003). See also the Technology entry. Wright's statement implies, among other things, that The Sims allows for simulated and interactable growth of characters and of living situations. The computerized play-ground of the dollhouse allows for the simulation of space and time, but the trade-off for the player is micromanagement under pressure.

Jenkins (2001) praises the game for "the logical culmination of the Girls Game movement and the beginning of the process of developing a more "gender neutral" playspace." Jenkins also mentions that focus group participants told game developer Maxis that they disliked the proposed game title Dollhouse. If Jenkins' praise is well-founded, then the play-ground of The Sims dollhouse is a positive example of literally

downsizing stereotypes in digital games.

Schell (2007:402) considers The Sims a form of pattern-playing (see also the Kindergarten entry). This designerly view conforms with that of Celia Pearce (2004), who has dubbed The Sims "the IKEA game," finding that there is a subtext of anti-consumerist satire in the game that exists alongside humorously described household items and living enhancements. Pearce also sees a latent Big Brother element (which we would dub a savoring play stimulus; see the Panopticon entry).

Paulk (2006) convincingly argues that the game has sped up a sociology of interior design, serving as a testing ground for lifestyle strategies by allowing users to try out different ways of furnishing and organizing a household. In contrast to Pearce, Flanagan (2007) argues that players in The Sims "maintain a consumer-driven suburban household" that not only reinforces the logic of the American urban sprawl (bulldoze or develop open space), but also validates and prepares users for a suburban way of life. Rolf F. Nohr calls this the "declension of a neoliberal urbanistic space" (Nohr 2007:470). The satire that Pearce describes likely got lost in the closed and fully controlled space wherein consumerism leads to a Society of success.

On the one hand, dollhouses reflect and miniaturize the world outside the play-ground; on the other hand, "miniature scale, clear boundaries, and inner life help players to wrap their heads, hands, and hearts around a world" (Gingold 2003:8). And it is the interplay between macro and micro scale that invites participation and that allows for safe tinkering and world-learning (2003:24f.). The play-ground of the dollhouse lets us oversee a World that we experience at close range.

24. War

Television does not really show it, but the space of war is still filled with blood, screams, and tears; and wherever people go, war goes sooner or later as well. Based partly on the war descriptions of Walter Benjamin, we have come to think of war as an all-dimensional spatial permeation – the play-ground of death.

Mumford (1961:42f.) illustrates how war was fundamental to the constituting and cyclic dynamics of the ancient City, which thrived and grew by preying on other cities' wealth and thereby itself became a target. Mumford further argues that war shaped the city until the 18th century, as visible European artifacts such as fortification walls, towers, and ditches make clear. Mumford also contends that this shaping brought forth institutional organization in the form of weapon-equipped leadership as well as the superiority of a quasi-standing army within the walls of a given city.

War produces a set of functional Technologies. These include technologies of protection (such as the walls cited by Mumford) and technologies of attack (such as the catapult, mobile siege cannon, or Leonardo da Vinci's fascinating war machine drawings), conceived as problem-solving mechanisms designed to conquer and/or kill. This is not to say that war is a game, although war is conflictive and typically has a quantifiable outcome. Rather, games are practicable devices by which to stage and, through rules, discipline war while avoiding its bitter consequences. The origin of games and the origin of the city, you see, are connected by the human practice of war-making.

Wargaming, then, is a mechanism for training people for warfare by simulating it. Between 1780 and 1820, a number of games were invented in Prussia that transformed and redefined chess into a "tactical game based on chess," called War Chess, which eventually became the Kriegsspiel, or War Game (Pias 2002:207).

The original game of that name, first demoed by Georg Leopold Baron of Reißwitz in 1811 to Prince Wilhelm of Prussia, used a sandbox within which a Terrain was modeled based on the "irrational" scale of 1:2373. Reißwitz, and later his son, Georg Heinrich, continued to iterate the rules and make-up of the game by, for example, adjusting the scale to a more reasonable 1:8000 and table-topping the game using topographical, modular terrain pieces instead of baking sand to puzzle war landscapes and lightweight metal figurines to represent troops (see Tessellation and Board). The rules of the Kriegsspiel board were known as "supplements," and these supplements were fairly complex, detailing movement and battling, and even allowing for the creation of new rules via a random generator device in those "exceptional" game situations in which even the Kriegsspiel's referee could not reach a decision (2002:204ff.).

Coincidentally, this miniaturization of war-making occurred at a time when other devices of miniaturization became tools to train by play (see the Dollhouse entry). Peter Perla (1990:4f.) describes how the Kriegsspiel eventually became quite popular

within the Prussian officer corps and how, in due course, it was introduced to the military in other countries such as the US, the UK, and France. Thenceforth, it shaped the development of wargaming as a tool for planning, strategizing, and de-briefing military action. Traces of the Kriegsspiel can be found not only in the US Naval War College's tile-based wargaming room or America's Pacific campaign in World War II, but also in the US Army recruiting videogame America's Army (2002) and in the US Army videogame Future Force Company Commander (2006), used to familiarize soldiers with the army's Future Combat Systems, in itself an extensive program featuring a game-like "warrior machine interface" (Korris 2007:426).

Claus Pias (2004:219ff.), in his archaeology of major computer game genres, points out how Kriegsspiel game elements such as the random generator and numerically intricate supplement can be considered a form of mechanical computation Technology (2002:204ff.). Pias also demonstrates how the Kriegsspiel has significantly contributed to what much later became the strategy computer game genre.

The Kriegsspiel and all war games that came after it attempt to abstract the kinetic extreme of player-player collision. In truth, wargames are allegorical play-grounds for an abstracted contest that will never actually take place precisely the way is has been played. Kriegsspiel is the only way to wage war peacefully; and because of that, pretending to play a game while, in fact, being at war is such a tempting deceptive strategy. This abstracting of war into gaming accompanies the abstracting of war into information-technology processes, including game-like interfaces, computerized weapons, or surveillance systems (De Landa 1991). This evolution leads not only to the synthesis of physical and virtual warfare, but also to the synthesis of warfare and gaming. In an interview conducted by the author in his capacity as co-editor of Space Time Play, James H. Korris, founding director of the Institute for Creative Technologies at the University of Southern California, which is mainly funded by the US Department of Defense, points out that "using this kind of synthetic view of the world, people get used to the idea of looking at the world as if it were a videogame" (Korris 2007:429).

25. Casino

When we think of casinos – in fact, when we think of logistically perfected entertainment – we first think of Las Vegas. For some, the city remains a blooming, alluring, ever-changing desert flower, an urban play-ground accommodating illusions, show, and chance, always moving one step closer to becoming the Situationist city of spectacle (Graft 1999). For others, Las Vegas is the manifestation of vice – a Darwinist play-ground of evil. Las Vegas and Venice (see the City entry) share more than just this quality of being perceived vastly differently by different people; both are desirable cities built as islands – one in the desert, the other off-shore – and in Venice, the first legal and public casino ever, a ridotto, was opened in 1638 in San Moise Place to be operated during Carnival. This 17th century ridotto is the original casino blueprint (Schwartz 2006:92ff.).

In comparison to the architectural manifesto of Venice, however, Las Vegas is a young city, and its story can be told in major milestones:

- **1905: The city starts out as a speculative land purchase – an empty stage on which the first purely service city in the world would soon be built (Häntzschel 2001:297).**
- **1931: The state of Nevada legalizes gambling.**
- **1941: El Rancho, Las Vegas' first casino hotel, opens.**
- **1970s: Downtown Las Vegas is enthusiastically celebrated as the urban solution for the age of automobile motorization: "The big sign and the little building is the rule" (Venturi/Scott Brown/Izenour 1977:13).**

Today: The urban situation has changed significantly. Downtown Las Vegas, then the heart of the city – and, as Hunter S. Thompson wrote, the heart of the American Dream – has become a rundown quarter full of prostitutes, homeless people, and wrecked buildings. The Strip, which used to belong to the Las Vegas suburbs, dominates and illustrates a form of new urbanism, populated as it is with block-sized hotel casinos, huge mock-up architecture such as the Venetian Campanile, and the Eiffel Tower, and a still spectacularly big mini Manhattan, entertainment rides slung around high-rise buildings, staged pirate battles, and a frequently erupting volcano. The city here is a monstrous, well-working amusement complex – a city-sized allegory of allegories. Las Vegas is, if we believe Hal Rothman, the first city of the 21st century; it anticipates the future of a society defined by consumption and entertainment as opposed to industry and farming (Rothman 2002). From a residential perspective, the most popular tourist destination in the USA (Henderson 2003:9) is also a rapidly growing agglomeration of uniformly looking McMansion virtual worlds – endlessly stretching suburban

communities with fantasy names such as "Inspirada," "Solista," and "Civita."

In these communities, the buildings all too often have been cheaply put together with wood and polystyrol foam and will last maybe twenty years. Gated communities turn public space into a jail yard; there are no playgrounds and not enough schools, and environmental abuse prevails. In a continuation of its double-edged tradition, the city of the 21st century may well be the "supernova of American Cities" (Davis 2003).

Las Vegas' sole play-ground function is to create maximum profit from entertainment stimuli. Though shopping and wedding tourism have become utterly important, the spatial embodiment of this function is still the casino, which accommodates and enables Las Vegas' major play pleasure: chance gaming.

The Mirage Resort casino opened on The Strip in 1989 and marks the merger of themed gambling and mega-scale accommodation. The Mirage ushered in a new era of entertainment spectacles that aim to fantasize chance; the term to fantasize is used both because in the official language of casino designers, themes are called "fantasy concepts" (Henderson 2003:10), and also because it has been convincingly argued that in Las Vegas, "form follows fantasy" (Hess 1993).

As the first casino fantasy to establish itself as a tourist destination, The Mirage Resort uses spectacular elements such as waterfalls, a lobby rainforest, an erupting volcano, captive animals such as tigers, tropically themed furnishing and finishes, ceilings, carpets, and elements such as an aquarium to set the stage for pre-play, play, and post-play. The casino itself resembles a Polynesian village with canopied gaming areas (2003:15f.). Robert L. Ward, Senior Vice President of Universal Studios Recreation Group, discussing the Portofino Bay Hotel at Universal Studios Escape in Orlando, FL, explains, "When you experience a hotel as a destination, you don't think, "Oh, a great building – I have to stay there." People don't say that. What they say is, "Let's go somewhere special, perhaps Europe...How about the Italian Riviera? Let's go to Portofino!" It's a more accessible story that reflects how we make our vacation decisions" (Ward 2001:5). Ward points out that entertainment placemaking differs from architectural placemaking in that the former allows for the incorporation of explicit storytelling elements into the built environment such as a premise, location, or cast of characters that enable visitors to make believe.

More recent casino resort destinations that reflect Ward's insight include the eight-hectare make-believe-Manhattan New York – New York Hotel and Casino. Located at the corner of Tropicana Boulevard and The Strip, the faux architecture, which cost half a billion dollars to erect, boasts twelve downsized copies of Big Apple high-rise buildings, the Statue of Liberty, Ellis Island and everything else needed to create the fantasy of New York City in the Nevada desert. A rollercoaster ride alongside the buildings adds even more vertical and horizontal excitement to this new urbanism experience. Figure 48 shows (and dramatizes) the silhouette of New York – New York.

Other types of interesting spaces that accommodate gambling also exist. Off-shore riverboat casinos such as Harrah's Shreve Star in Shreveport, Louisiana, combine gambling with the symbolic power of the heterotopian epitome, the ship, thereby creating an über-heterotopian play-ground. The Shreve Star, built in Missouri and later towed to Louisiana, is not an authentic riverboat; rather, it has been designed to resemble one, and thereby adhere to the requirements of a certain Missouri gambling law (2003:82ff.). The Shreve Star is home to three gaming floors that feature expanded heights to accommodate bulky casino equipment. On all floors, a basic, overwhelming, bright, attention-grabbing casino theme prevails. On the Palace of Fun floor, this is accompanied by circus-like colors, forms, and finishes; on the Crystal Palace floor, by a 19th century, botanical glass conservatory look and feel. And yet when playing on the Shreve Star, the author felt that the theming destroys the atmosphere that could have been created by the ship situation itself; or rather, that nautical elements would have amplified the heterotopian situation, which would have been preferable to adding yet another heterotopia.

The way that casinos are designed and fantasized as spaces reveals a generalizable pre-assumption: that the fantasy of narrative architectural illusionism in alliance with other spectacles such as live concerts contributes positively to visitor experience. For example, an empirical investigation of visitor satisfaction at atrium-type casino resort hotels in Las Vegas revealed that these types of quasi-interior public open spaces create a positive feeling of urbanity as long as the atria are humanized, e.g. by use of human scale zoning, inclusion of shopping stores and seating areas, effective connectivity between atria, or promotion of pedestrian circulation, i.e. walkability (Sun 1997). Atria, then, could become the new public plazas of Las Vegas-style urbanism, which would represent a significant departure from the automobile focus of Las Vegas

in the 1960s and 1970s (Venturi/Scott Brown/Izenour 1977).

Still, gambling remains the center of attention of all connected plazas in Las Vegas. Whereas on a ship casino, the casino takes up all space on all the floors (i.e. the ship is, spatially speaking, the casino), in resort casinos, the casino is the central area of the property and thereby expresses the fact that gambling is at the heart of all resort activity.

When zooming in on the casino games in the fantasized space, we see women and men gamble casino chips on possible random (combinations of) outcomes, with a quantifiable luck factor involved. There are table games, gaming machines, and random number games such as Bingo. All create certain types of game systems, which we can investigate in terms of, for example, the magic circle, spatial representation, type, or kinesis. Ultimately, though, the goal is to beat chance. In the early 1960s, Edward Thorpe and Claude Shannon carefully studied the anatomy of American Roulette. Over the course of several months, Thorp and Shannon analyzed the motion of the ball in relation to the space of the roulette wheel by, for example, operationalizing how the ball is launched, how it orbits from stator to rotor, how it is affected by the spinning rotor of the roulette wheel, and how their measurements were affected by timing errors. Based on the data gleaned in their experiments, Thorp and Shannon designed the first wearable computer. The size of a pack of cigarettes, the computer was controlled by its wearer's big toe and in the lab, yielded an expected gain of +44% when the wearer bet on the most favored numbers. When secretly testing the device with their spouses on site in Las Vegas in the summer of 1961, the researchers saw their predictions consistently realized when they played with the 38 numbered and colored roulette pockets. Their device, which combines innovation in both the realm of Mobility and Technology, was made public many years later, but was eventually banned by the courts in the state of Nevada along with all other outcome prediction devices (Thorp 1998).

When it opened in 1989, The Mirage Resort was not only the first casino to exploit the idea of mass-scale fantasizing, but it was also the first casino to use a closed-circuit television system with cameras on all tables, at all times (Knightly 2007). It is safe to assume that this CCTV system was installed mainly to prevent the illegal use of prediction machines such as the one Thorp and Shannon created. Based on the three elements discussed in this section – i.e. Panopticon-like surveillance, themed entertainment, and computing – we derive an impression of Las Vegas as the urbanistic play-ground of pervasive surveiltainment. Is this form of entertainment at least innovative? Quite to the contrary, most of the themed fantasies are either borrowed from successful Hollywood blockbusters or recycle "the arcade, the state fair, the world exposition, and the ambiance of the cosmopolitan, pedestrian City [bolding and underlining mine]" (Gottdiener 1997:151). So, is the loss of privacy and the lack of innovation worth the gain in spectacle? Or is the recent foreclosure of the Cosmopolitan Resort & Casino building project a sign that the policy of unlimited entertainment has come to an end in the western world?

As Ian Bogost notes,

The casino, tavern, arcade, and pizza theater (e.g. Chuck E. Cheese's) all share similar properties. They are enclosed spaces without windows in which participants can easily lose track of time. They are dark and constricted, with limited space for free movement. The games therein are provided not for their own sake, but as a means to an end, as a way of drawing players into spaces, keeping them there and taking their money (whether as payment for the games themselves or for other services) (Bogost 2007:305).

The casino, then, is not only a panoptic play-ground for a kind of adult pinball; it is a play-ground that continuously perfects persuasion.

26. Mall

The Monroeville Mall in Monroeville, PA is a roughly 100,000 square meter indoor shopping complex constructed between 1967 and 1969. Figure 49 shows one of the mall's entrances as well as the corridor that leads from that entrance into the mall.

Once the United States' biggest mall, the Monroeville Mall served as the main location for George A. Romero's highly influential 1978 horror film, Dawn of the Dead. The production of the movie was partially financed by the owners of Oxford Development Company, the firm that had built the mall and was managing it at the time of shooting. The zombie movie, then, served not just to entertain movie-goers, but also to market the mall. This is somewhat surprising considering that both the mall setting and the

plot itself made Dawn of the Dead a harsh critique of American consumerism. While insatiable zombies hungry for human flesh are barred from entering the mall, the supposed sanctuary character of that mall together with its heterotopian inscenation of supplies soon wears thin on the main protagonists once they realize that their safeguard is, in fact, their prison. In Dawn of the Dead, the mega-mall is not only "a substitute City [bolding and underlining mine] center and rendezvous point, but even an amusement or theme park" (Borries 2004:43) (see the Amusement Park entry), but also a site where players seek to solve the problem how to survive as long as possible in an effort to outsmart their enemies, the zombies, who just as passionately seek to devour them.

In homage to both the Monroeville Mall and Dawn of the Dead, the designers of Capcom's Xbox 360 action-adventure game Dead Rising set their game at the "Williamette Parkview Mall," for which they designed an environmental Map clearly inspired by the film. See Figure 50.

The play-ground of the mall is filled with consumerist collectibles meant to both still and instill hunger, the most profound desire.

27. Castle

The castle as a play-ground has different faces, but it is always an expression of fortification and enclosure and is thus a form of military architecture. When games implicitly or explicitly involve the castle trope (which, in the western world, usually appears in the form of motte and bailey, fortress, citadel, or, more representatively, palace), it can be assumed that some type of contest between competing powers or metaphor for defense or attack pervades the activity. War and castle are common, if not cliché, ludic architectural tropes.

The castle awes and expresses power by virtue of its scale, not only to intruders, but also to the populations who live near it, which it overshadows and commands. It defines a kind of artificial island in the wild. Note that this island-like nature of castles also explains why we are particularly fascinated by urban islands such as Venice, New York, Las Vegas (in the midst of the desert), and, formerly, West Berlin (in the midst of socialism).

This is all the more interesting when one considers the fact that "the proto-city had (...) the beginnings of its institutional life in the fortified camp and the shrine, not necessarily occupying a common site" (Mumford 1961:64). In German, the term Burg – which has always meant "fortification" and today, also means "castle" – was long used to describe the spatial form of the City, as evidenced by the names of many cities, like, for example, Hamburg or Regensburg. Likewise, the German term Bürger means "citizen", or, more literally, "townsman." Similarly, in colloquial English, "burg" still connotes a city. Neither city nor citadel can be thought of without thinking of the other; and in Europe, neither can be thought of without thinking of the heritage of antiquity and the many Roman fortresses out of which modern cities grew. The play-ground of the castle is an ur-symbol of urbanity.

Functionally, castle gameplay can be achieved in many ways. Castles can be strongholds to be placed or obstacles to be overcome. They can feature a palisade made up of pointed pales, a ditch surrounding a steep motte, a sleek scarp of rampart to climb, with soldiers hiding behind parapets, terreplein that must be hit, scorchers behind loopholes, a postern to seek and secretly enter, a wooden horse body to smuggle men into the polity, and, ultimately, a keep that must be penetrated (see Ching 1995:98f. for castle terminology). Inversely, castles can also be fortifications that must be defended.

Inside the castle keep, other functions are possible. Often, booby traps, secret passageways, and other Labyrinth (and Maze) structures are contained in this extruded Cave. Sometimes, they feature nightingale floors, across which we must walk in order to get from one room to another (see Figure 51). In Japanese palaces and temples, these nightingale floors – 鶯張り in Japanese, or uguisubari – are floors designed to fabricate chirping, nightingale-like sounds when tread upon, thereby serving as a kind of building embedded alarm system. From a game design perspective, this feature can be considered an interactivation design technique as described in the Cave entry.

Symbolically, in a game of power, a castle can be a Folly, and as a folly, a political "stamp." For example, the Hohkönigsburg castle in Alsace in France lay in ruins for over two hundred years before being refurbished as a "fairytale castle" of the reigning Hohenzollern house by Berlin architect Bodo Ebhardt, commissioned by German

emperor Wilhelm II. The refurbished castle combined political and attractor functions (Willaume and Richez 1991), but also sounded a warning, and thus militaristic signal to the French. Today, the castle is one of the most popular tourist destinations in France, serving to remind visitors of the former German presence in the Alsace. Entertainment and military, we see, were co-evolving even before the invention of the computer. Whereas "the digital emerges as military, but achieves acceptance as entertainment" (Wark 2007:95), the analogue Hohkönigsburg emerges as military warning, but achieves acceptance as entertainment.

Finally, let us look at the castle trope when used both as backdrop and interactive playground. The PS2 action-adventure game ICO (Sony Computer Entertainment 2001) is designed, explicitly, iconographically and beautifully based on the trope of castle architecture, and it represents "a huge spatial puzzle from which you, the player, must escape" (Davidson 2007:54). In ICO, the constructive trope is well-supported and achieved by the way the game camera follows the player context-sensitively (Adams and Rollings 2006:247). The camera, using different positions and angles, intelligently inscenates not only the action, which is, of course, most important for an action-based game, but also the immense architecture and landscape. Through these shifting camera positions, the game both mentally and pictorially maps and almost draws the gamespace panorama for the player. In addition, in ICO, the gamespace itself is the puzzle from which the player must escape, "by climbing, jumping, pulling levers, pushing crates and running around" (Davidson 2007:54).

Through kinesis, the player "learns" the embedded game architecture of ICO. But this is not where the cleverness of the design with regards to the architectural experience stops. In ICO, the player controls a boy, but in order to end the game successfully and traverse gamespace, the boy must take care of a mysterious girl, protect her, and help her overcome numerous spatial challenges. To do so, the player-boy holds the girl's hand throughout the course of the game. This hand-holding is an essential part of the gameplay and is underlined by controller force feedback, affecting the player's Body. "This creates an intimacy between the two characters lost in the castle; the virtual/physical act of holding hands is the means by which they work together to get through the ruins" (Davidson 2007:55). In this way, the gamespace in ICO is integrated emotionally through a deeply human bond, perceptually with the help of a context-sensitive landscaping camera, and cognitively by virtue of the fact that challenges are created for the boy and on behalf of the girl.

In ICO, the castle is the game system, and the game system is the castle. This conversion of a castle into a game system reminds us of the Fun Palace, an improvisational architecture conceptualized by architect Cedric Price in 1964 together with avant-garde theater director/producer Joan Littlewood, who, in 1955, premiered Bertolt Brecht's play Mother Courage and Her Children in London, thereby bringing the concept of Brecht's Epic Theater to the UK. (See Theater, where Brecht's vision of breaking the fourth wall between actors and audience is discussed.)

The Fun Palace - cf. Figure 52 - is not a conventional building, but rather an ad-hoc construction of leisurely learning and discovery, where a scaffolded structure for pivoting stairs and escalators, moveable (and prefabricated) wall, floor, ceiling, platform, and stair modules, and overhead cranes affords constant constructing, dismantling, and reassembling. The Fun Palace, in other words, is a life-size kit-of-parts Playground of performativity and kinesis between players, objects, and the environment, which, theoretically, aims to eliminate contest and encourage creation and adventuring. Littlewood "envisioned an ideal realization of Brechtian theater as a place of cultural bricolage where people could experience the transcendence and transformation of the theatre, not as audience, but as players and active participants in a drama of self-discovery" (Mathews 2005:76). In the original Fun Palace concept, we can see not only an affinity to Brechtian theater, but also to the Situationist urban ideal of New Babylon (see the Society entry), in which the symbol of the palace was supposed to be democratized.

Price, designing based on Littlewood's theatrical brief, began to plan for the construction to learn, with the help of artificial intelligence and computation, behavioral patterns, and not only adapt to the player's current program, but also to anticipate future activities, thereby gradually shifting the focus from Brechtian theater to cybernetics, control systems, and social engineering. In fact, the inclusion of cybernetics scientists in the conceptual planning of the Fun Palace quickly led to the treatment of Palace players as data whose interests and activities would be monitored by sensors and computers. The Palace system would thereby have helped "modify people" with the help of virtual reality-like simulations such as "a trip around the moon in a space capsule," an "underwater restaurant," a "maze of silence," or a "fantasy

generator." "Today, the idea of "unmodified" and "modified" people makes us recoil in horror. Yet, in the 1960s, the prevailing and naïve faith in the endless benefits of science and technology was so strong that the Orwellian implications of "modified people" went largely unnoticed. At the time, the "social control" aspect of the Fun Palace was seen as a constructive contribution to society" (2005:85f.).

Conceptually speaking, the Fun Palace anticipated the virtual realities of digital games as well as the privacy issues of surveilled entertainment and, more generally, pervasive computing (see Panopticon). Indeed, the Fun Palace truly would be an interesting role model for a building-based pervasive playhouse. Formally and aesthetically speaking, the unrealized Fun Palace certainly impacted architectural design and the construction of many realized buildings. For example, referencing the design of the Centre Pompidou in Paris, Reyner Banham writes that that "the concept of a stack of clear floors that can be adapted to a variety of cultural and recreational functions seems to recall the (...) Fun Palace of Cedric Price and Joan Littlewood, even if the project was never as radical as the floorless Fun Palace, or as casually innovatory as Price's Inter-Action Centre," a realized, but much smaller Fun Palace-like hands-on leisure center in the UK, demolished in 2003 (Banham 1977:275).

The lesson is: a castle designed for fun can break the symbolic power of the play-ground, but will exert control over any player who chooses to experience it.

28. City

For the oncoming tourist sitting on one of the ferry boats speeding through the saltwater lagoon, Venice's centro storico is highly evocative. The cityscape and overall composition of the city center are incredibly moving, featuring, as they do, the Campanile, the combined colors of canals, palaces, and water, buildings that sharply carve an island of islands, and that special Venetian summer smell. All these make the city memorable. Camillo Sitte writes romantically of Venice: "So much beauty is concentrated on this single patch, no painter has ever conceived more beautiful architectural backdrops, no theatre has ever seen anything so sensually captivating than what has been capable of arising here in actuality."[57]

Venice's aesthetic qualities are a fact; wayfinding in Venice, however, is a challenge. No wonder that Venice, the most touristed city in Europe (see Casino for the most touristed city in the US) and, claro, the most beautiful city in the world, is the epitome of the urban game: a citywide Labyrinth (and Maze).

In The Image of the City, Lynch (1960) empirically explores how city dwellers perceive and envision spatial information while navigating through urban space. Although the study was conducted using only US cities as examples, Lynch identifies a number of systems that render the example cities more legible for the study subjects and allow for what he coined "wayfinding," i.e. "a consistent use and organization of definite sensory cues from the external environment." (1960:24) Wayfinding devices assist people in constructing a predictable mental map, an environmental image. Lynch organizes the elements of this mental map into five categories, in turn creating a design vocabulary for urban wayfinding that has since served as inspiration to urban planners and architects as well as information and interaction designers. Lynch's elements follow:

- **Paths: The streets, walkways, transit lines, canals, railroads, and other urban channels through which people travel.**
- **Edges: The walls, shores, fences, barriers, shorelines, and other perceived boundaries that exist in relatively straight lines, thereby demarcating as well as relating distinct areas.**
- **Districts: Larger sections of a city that are distinguished by their unique identities or urban characters (Financial Districts, for example).**
- **Nodes: Focal points such as intersections, enclosed squares, subway stations, and other transportation hubs.**
- **Landmarks: Readily identifiable points of reference (in Europe, for example, the Eiffel Tower in Paris or the Fernsehturm (TV Tower) in Berlin).**

Lynch derives two concepts from his study. The first is the imageability of a city: "a quality which gives it a high probability of evoking a strong image in any given observer" (Lynch 1960:9). The second is a city's legibility, that is, "the ease with which [a city's] parts can be recognized and can be organized into a coherent pattern...a legible city would be one whose districts or landmarks or pathways are easily identifiable and are easily grouped into an overall pattern" (Lynch 1960:10).

For the oncomer on the boat, Venice at first appears highly imageable and legible. But

for those traversing the city on foot, the sheer combinatorial possibility of canals, bridges, pieces of art (statues, roundels, coats of arms, crosses, reliefs, logos, plaques, and fragments), Squares (campi), small squares (campielli), and lanes – alternately called alli, salizzade, rughe, liste, rami, sottoporteghi, rii terrà, and fondamenta – is the underlying truth of the Venetian game.

Venice, navigationally speaking, is simply disorienting. Fabio Carrera (1997) has shown that at least on the level of the Campo Santa Maria Formosa square, for example, Venice can be imageable thanks to the free-standing church landmark. As a navigational network, however, the city remains an exciting maze. No wonder, then, that the annual Orientamento a Venezia – abbreviated as just Orivenezia – is the toughest city orienteering competition in the world.[58] (See also the "Nature" entry, which discusses the sport of orienteering). Yet, arguing only in terms of navigation would not do Venice justice. Like so many other European cities, as well as New York and Boston in the USA, Venice immerses pedestrians in a three-dimensional narrative (see Pearce (2007:201)).

As a city experience, the Venetian maze is acceptable (and made possible) to us because, with every other turn and break of visual angle and perspective, there is always some new thing to adore, a compelling urban story to discover, a dead-end to realize. Venice, in short, is a perfect archipelago adventure for disorienting pleasure. Venice, we daresay, is the perfect physical urban play-ground because it combines the kinetic participatory delights of pursuing vertigo, contemplating, savoring, adventuring, amusing (tourists usually visit in groups of two or more), problem-solving, and wayfinding achievement with a unparalleled pedestrian experience of Mobility. It is, in short, a play-ground in and of itself.[59] _ We can only hope that the game generation will still have the chance to play Venice, which is in constant danger of being flooded by rising waters. Should that happen, gamers may instead decide to see the replica Campanile at the Venetian Resort Casino in Las Vegas, proclaimed Entertainment Capital of the World and Venice's New World counterpart. Similar to the perfect, but sadly and slowly sinking play-ground for making one's own urban adventure, the urban archipelago of Casinos within the Clark County desert vegetation offers a gamble on one's future, too.

In the game REXplorer, the city of Regensburg is not only used as a backdrop, but as a functional platform and raison d'être for the game. The game design understands the city as a rhetorical landscape that persuades the player to move between urban sites. Players are presented with audio drama based cliffhanger puzzles spoken by site-specific characters. By way of these audio cliffhangers, characters offer quests to the players, which can only be resolved at other sites. Players, then, must keep moving in order to play the game. Through this core mechanic, the audio augmented city becomes a physical game Board on which player mobility is influenced with the help of reward structures (players who successfully resolve their quests receive points, and walking itself is credited as well). For a more detailed discussion of this aspect of pervasive gaming, see Walz (2007) as well as Walz and Ballagas (2007).

The cityscape of Venice and the REXplorer game teach us important lessons as to how to design exciting mazes and how to think of them architecturally and in terms of urban-like relationships. We can also turn this around and think of the World Wide Web as an urbanistic maze; the pervasively computed city towards which we are heading today is another such maze. See Figure 53, which sets both maze metaphors into relation.

When one considers the urban maze of Beijing, where a labyrinthine, disorienting structure is achieved by demolishing whole city quarters, one may be inclined to think that Venice will spearhead the heterotopian model of the European city-as-museum.

But, although the Asian model may try to abandon the European Labyrinth (and Maze) topos, it inadvertently re-establishes that exact model through constant changes in the cityscape and in building usages.

29. Society

On the evening of December 20, 1960, in a militant presentation at the Stedelijk Museum in Amsterdam, Constant Nieuwenhuys – a Dutch architect whose name is commonly shortened to Constant – accused the modern City of being an exploitative, utilitarian machine that demands productivity from its population, that pacifies with pseudo-"Nature", and that destroys life. Constant suggested a solution called New Babylon, which he later revised again and again, but which, at its core, constitutes "a vision of a ludic society" (Nieuwenhuys 1974). In this "counter-design to Modernism's functionalization and realization mechanisms for architecture and town planning"

(Feireiss 2007:218), inhabitants play a creation game of movable walls, floors, partitions, ramps, stairs, bridges, and infinitely variable qualities of light, color, ventilation, texture, temperature, and moisture, designing their own environment for adventuring against their designed backdrop. Architectural historian Mark Wigley evocatively recounts Constant's concept:

Technology has long been the new nature that must now be creatively transformed to support a new culture. The increasingly traumatised inhabitants have to take over the shaping of their own spaces to recover the pleasure of living. This reshaping will soon become their dominant activity when automation handles all forms of production. Leisure time will be only time. Work gives way to an endless collective play in which all fantasies are acted out. The static constructions of architects and town planners are thrown away. Everybody becomes an architect, practising a never-ending, all-embracing "unitary urbanism."" (2001:9).

New Babylon represents an activist's and activist play-ground, an elevated, jungle gym-like (see the Playground entry in this inventory) fluxus labyrinth, covered on a planetary scale, programming an "unfunctional and fantasy way of living (...); people would constantly be travelling" (Nieuwenhuys 1964/2001:14). At Constant's first presentation at the Stedelijk, however, the debaters raised a fundamental question: would New Babylon liberate humanity by affording the pleasures of fluidity and of creative and adventurous play? Or would it be a prison? (Wigley 2001:11)

Constant's vision of an all-consuming hyper-urbanism overwriting the city (Sloterdijk 2006:98) accommodated the revolutionary goal of the Situationist International (SI), of which Constant was a member when he first presented New Babylon. This SI goal was to overcome not only modernist architecture, but to conquer consumerism and, ultimately, capitalist society through ludism. A 1957 fusion between radical avant-garde artists and groups (mainly, the Lettrist International centered on the artist-theorist Guy Debord and the Mouvement international pour un Bauhaus imaginiste, founded by the painter Asger Jorn), the SI experimented with a number of ludic techniques and provocations, among them New Babylon, under the umbrella of the concept of psychogéographie (Stahlhut et al. 2006). Basically, psychogeography can be described as the playful becoming aware of, reimagining, and exploration of the city; in other words, the affective realization of the city. In the following list, a number of exemplary psychogeographical techniques are presented:

- **In the first issue of its magazine Potlatch, the Lettrist International published "The Psychogeographical Game of the Week":**

In accordance with what you are seeking, choose a country, a more or less populated city, a more or less busy street. Build a house. Furnish it. Use decorations and surroundings to the best advantage. Choose the season and the time of day. Bring together the most suitable people, with appropriate records and drinks. The lighting and the conversation should obviously be suited to the occasion, as should be the weather or your memories. If there has been no error in your calculations, the result should satisfy you (Debord 1955/2004).

- **In our terms, we can think of this game as consisting of adventuring and creation play pleasures, with some risk-taking and performing-socializing.**
- **The Situationist practice of dérive, a term coined by Russian LI member Ivan Chtcheglov meaning, literally, "drifting." The dérive is similar to Constant's ever-traveling Homo Ludens, in that it refers to constantly and rapidly vagabond and adventure through different areas in the city (Stahlhut 2006:10). Game rules and gamespace were defined for a dérive; this included starting and possible rendezvous points, duration, number of participants, size and kind of urban playground, objective, and activity filters such as, "Look for all taverns serving white rum," or "Take a cab and drive 20 minutes westwards before starting the dérive" (Debord 1958). The Universal Psychogeographic Computer (Hou Je Bek 2007) introduced earlier in this section in the discussion of utopian play-grounds can be considered a dérive device, while Debord's and Jorn's The Naked City map of Paris bears witness to ample, vertiginous adventuring – a nomadic kinesis, leading to a joyful re-discovery of a city by the way of a design that "simultaneously mourned the loss of old Paris, prepared for the city of the future, explored the city's structures and uses, criticized traditional mapping, and investigated the relationship between language, narrative, and cognition" (Sadler 1998:60). See Figure 54.**

- **The Situationist practice of détournement is a creative play pleasure meant to misappropriate, reorganize, pocket, and de-contextualize existing structures such as signs, façades, objects on the streets, etc. (Debord and Wolman 1956). It is a**

combination of adventure-creation with components of risk-taking.

Borries (2004) traces how Nike applies subversive practices as marketing tactics in urban areas in an effort to penetrate sub and counter cultures and thereby establish a branded city that transcends the logic of everyday. Just do it, so to speak, like André Agassi and Pete Sampras did in a Nike TV spot in which they played tennis on New York City's 5th Avenue as an act of liberating the regimenting of the city: the street becomes the tennis court, the sidewalk the bleachers. But whereas the New York City TV spot was merely symbolic, the Nike basketball court surface made of recycled sneaker soles (bearing the Swoosh logo, naturally) located at Berlin's Alexanderplatz, the heart of the city's public sphere, is very real: "The Situationist strategy of fake and détournement can be discovered as an instrument of communication in nearly all of Nike's urban interventions. They serve here the same function they do with the Situationists and media guerillas, namely to gain access to new spaces of interpretation and opportunities for reflection" (Borries 2004:72).

When reading these lines and thinking about recuperating marketing, let us not forget where the Situationist games came from; in its heyday, dérive promised a new urbanism with "rooms more conducive to dreams than any drug, and houses where one cannot help but love" (Chtcheglov 1958). Building authentic pantopian dreams, then, can be a tactic stronger than the tactics of those who succeeded in misappropriating by misappropriating their greatest enemies. In a society in which life presents itself as an immense accumulation of commodified spectacles, a fallback Walden tactic is still by far more truthful than
radical opportunism.

In our context, street and guerilla artists show us an alternative to life in the woods (which can be seen as an early example of a self-governd alternative to the society of the spectacle). With guerilla art, people express themselves, often playfully, in a public space, in order to affect as well as to reclaim the space, to make a political statement, to decontextualize or to intervene, often with the goal of letting people interact with this environment in a novel, though-provoking way. Basically, this can mean that someone presents someone else with something elsewise than what they might suppose: "Like a random act of kindness, guerilla art has the potential to create a ripple effect. Imagine the postal worker running through his day, stopping for a moment to read a quote you have chalked onto the sidewalk." (Smith 2007:15) writes Keri Smith in her inspiring book The Guerilla Art Kit. This tactic of anonymous artists entering into people's daily routines, then, overlaps with Situationism, but may be more about beautifying, questioning and interacting with space impermanently than about altering space forever.

30. Topology

A topological play-ground maps how nodes in a social network are acquainted, just as in the following example:

To prove that nowadays the population of the Earth is in every aspect much more closely interconnected than it has ever been, one member of our gathering proposed a test. "Let us pick at will any given existing person from among the one and one half billion inhabitants of the Earth, at any location." Then our friend bet that he could establish via direct personal links a connection to that person through at most five other persons, one of them being his personal acquaintance. "As people would say, look, you know X.Y., please tell him to tell Z.V., who is his acquaintance....so and so." "OK," said a listener, "then take for example Zelma Lagerlöff" [literature Nobelist, born 1909]. Our friend placing the bet remarked that nothing is easier. He thought only for two seconds. "Right," he said, "so Zelma Lagerlöff, as a Nobelist, obviously knew the Swedish king Gustav, since the king handed her the prize, as required by the ceremony. Gustav, as a passionate tennis player, who also participated at large international contests, evidently played with Kehrling [Béla Kehrling, Hungarian tennis champion and winner at the Göteborg Olympics 1924, 1891-1937], whom he knew well and respected." "Myself," our friend (he was also a strong tennis player) said, "I know Kehrling directly." Here was the chain, and only two links were needed out of the stated maximum of five (Braun 2004:1745).

Chemist Tibor Braun, in a letter to Science magazine, translated the aforementioned portion of a humorous short story composed by Hungarian writer Frigyes Karinthy in 1929, originally called Láncszemek – in English, Chain-Link. As you will note, the activity described – i.e. the test – is really a game, with the objective to prove that the bettor knows, by a maximum of five linking chainmen, any other given person on the planet. The play pleasures implicitly include contesting, problem-solving, (social) storytelling, and the kinetic pleasure of jumping from node to node, and thus, from

friend to friend-of-a-friend. Karinthy's short story also anticipates, by many decades, the scientific discourse surrounding the structure of social networks and particularly, their connectedness. The fictional story marks the appearance of a spatial concept we know today as "six degrees of separation."

One of the first quantitative studies concerning the structure of social networks was conducted by controversial social psychologist Stanley Milgram in the late 1960s. Milgram (1967), then at Harvard University, sent letters to random subjects in Wichita, KS and Omaha, NE, whom he asked to participate in a scientific experiment by forwarding the letter to a target address through a personal acquaintance who is more likely than the subject to know the target person, either a stock broker in Boston or the wife of a divinity graduate student in Massachusetts. Milgram's goal was to find the "distance" between any two people in the US. Based on the letters that arrived at their destination and the log filing postcards that chain-persons were asked to mail to Harvard, Milgram conjectured that 5.5 was the average number of acquaintances separating – and thus, connecting – any two randomly chosen human beings in the United States.

Milgram's experiment has been harshly criticized for lack of scientific rigor, for little evidence of successfully completed chains[60], and for not reflecting the implications of mail forwarding factors (and hindrances) such as race or class (Kleinfeld 2002). Yet, the concept of a world of socially linked "small-worlds" prevailed, and eventually lead to playwright and screenwriter John Guare's play and movie, Six Degrees of Separation (1993), which introduced the idea of a worldwide linkage system. J. J. Abrams, who starred in the movie as the character Doug[61], later became the executive producer for the TV series Lost (2004-present) and Six Degrees (2006-2007), both of which implicitly and explicitly use the six degrees of separation concept as a storytelling and character puzzling device. Figure 55 shows a Lost character connection map excerpt featuring exemplary characters and series locations.

In Lost in particular, but also in general, the concept of six degrees of separation makes us comfortable, because it creates the illusion (and mystery) of intimacy, and it has an utmost alluring explorative play character that spans all of social space. The online social networking sites Friendster and Facebook play on the concept, too. But is the concept scientifically valid? Or maybe the more appropriate question is: In which play-like contexts do we find small-worlds?

Figure 55

A socio-narrative topology among

exemplary characters and locations

in the TV show Lost (ABC).

Duncan Watts and Steven Strogatz (1998) show that many natural as well as designed networks exhibit the small-world property, achieved by adding a small number of random links to a network, which reduce its diameter – i.e. the longest measured direct path between any two vertices in a network – from very long to very short. This finding suggests that infectious diseases spread more easily in small-world networks than in regular networks. The small-world architecture developed by Watts and Strogatz also supports the observations made by sociologist Mark Granovetter (1973) in his milestone paper, The Strength of Weak Ties, in which he asserts that our acquaintances – i.e. our weak ties – are less likely to be involved socially with one another than are our strong ties – i.e. close friends. Any individual, therefore, forms a low-density network with weak ties, whereas in comparison, a set consisting of that same individual and her close friends forms a high-density network enabled by the presence of many of possible lines. See also Granovetter's critical recapitulation of his own argument in Granovetter (1983). Both findings let us think of playspaces as sites where something is passed on (or back) in space, allowing for contesting, risk-taking ("Will this prove to be a strong tie?"), chance, collecting, adventuring, or storytelling; think of a Telephone-style[62] information corruption activity or an activity in which a story (an image, a video, a song) grows from node to node.

In an effort to reveal the mathematical features of a sexual-contact network using a random sample of individuals, Liljeros et al. (2001) found that the connectivity of an objectively defined non-professional social network linked in the most intimate way possible is scale-free. That means that there is no core group that is separated from other individuals. Scale-free describes the fact that in sexual-contact networks, one can observe connectivities much larger than the sample's mean, in contrast, for example, to

a single-scale network. In a single-scale network, each agent would have had the same amount of sexual contacts, creating an exponential and homogenous network, as opposed to a non-homogenous scale-free network.

Using citational and co-authoring data from scientific papers in physics, biomedical research, and computer science, Mark Newman (2001) investigated the "Who is the best connected scientist?" game and came up with the following summary:

In all cases, scientific communities seem to constitute a ''small world'' in which the average distance between scientists via a line of intermediate collaborators varies logarithmically with the size of the relevant community. Typically, we find that only about five or six steps are necessary to get from one randomly chosen scientist in a community to another. It is conjectured that this smallness is a crucial feature of a functional scientific community.

We also find that the networks are highly clustered, meaning that two scientists are much more likely to have collaborated if they have a third common collaborator than are two scientists chosen at random from the community. This may indicate that the process of scientists introducing their collaborators to one another is an important one in the development of scientific communities (Newman 2001:408).

The results from the sexual-contacts research as well as the citation game are consistent with findings suggested by Barabási and Albert (1999) as well as by Albert/Jeong/Barabási (2000) and a categorization popularized in Barabási (2003). Barabási counts small-world networks as exponential networks, in contrast to Technology-based networks, which are scale-free and feature self-organizing properties.

These properties are governed by two straightforward rules: (a) expansion (nodes are added one node at a time for a given period of time), and (b) preferential-attachment (new nodes connect to existing nodes and are more likely to connect to the more connected nodes). More than a fixed six degrees of separation, these principles are likely responsible for the scale-invariant architecture of the World Wide Web, where Website's nodes seek to link themselves to hubs, i.e. Websites with the most connections. Figure 56 visualizes the difference between these two types of networks.

Barabási's principle of preferential-attachment is interesting when viewed from a game design and play pleasure perspective, beyond storytelling and character topologies such as those found in the TV series Lost. The principle indicates that scale-free play architectures can emerge when play-others – players, objects, and spaces – have been found more attractive by previous players than other play-others. When implemented, this could play a role in orienteering-like games (see "Nature") and scavenger hunt situations, as well as in exploration and adventuring play and game types in general. The similarity of this hypothesis to the principle of social navigation, which holds that participants' activities in a (physical or virtual) space are influenced by observing and following other participants' activities (Dourish 1999), is striking.

In the hybrid network space of REXplorer, another type of topology has been established, in which physical sites are connected through the fiction and rules of a game (as opposed to, say, a physical topology in which wires or cables connect nodes). In designing the game, which is intended as a playful yet educational touristic offering that goes beyond the classical guided tour, we reviewed the city of Regensburg's overview list of over 1,400 protected historical buildings, which describes each site's erection, make up, and usage over time. We then cross compared a number of city sightseeing guides including the city's tourism Website, finally filtering 29 sites of interest out of the mass of information; these represent typical sights that tourists would want to see during a day-long visit.

In the first design draft, we decided that each building or a building's main function over time should be represented by a site-specific character. To prototype these characters and give them personality depth, we used a character sheet format. This consisted of a one-page description of the different characters that provided an at-a-glance overview to simplify the review process. These character sheets were important in communicating our more detailed content ideas with the local tour guides for content supervision as well as for guiding the voice actors. The character sheets provided a compact and highly browsable format that supported an effective review process. The tour guides were able to suggest improvements or changes in character selection very easily using this format. The changes at this stage of the design process were easy to incorporate and they prevented significant rewriting of the full script later on.

The main challenge of narrative production, then, lay in bridging the characters (and

City sites) so that they would be connected meaningfully, as well as emotionally, through quests. In the design document, we created guidelines as to which general emotional dimensions could bond the characters so that players would want to travel from site A to B to fulfill a quest in order to hear the resolution of a cliffhanger. In the game dialogue script, we applied emotional bridges such as romance, greed, and fear to the Non Playable Characters' (NPCs) quest stories, while planting clues in the NPC's sentences as to which element gesture the players need to cast. For example, at the site of the historical character Barbara Blomberg, we embedded the clue for the expected gesture element "water" by having Barbara, crying, ask the player to take her "tears of her love" to emperor Karl V., who she has only seen once, but with whom she has a son

Once we had created example quests between characters, the script draft was reviewed by stakeholders. Based on the feedback, we eventually created 59 quests with the help of a travel journalist, who acted as a co-writer. The final script was iteratively fine-tuned and was recorded at a professional recording facility. Figure 57 shows REXplorer's narrative topology as well as the game's kinesis topology in the relation to the physical site on top of a city core map. As can be seen from this Figure, REXplorer provides a connectivist perspective of the city of Regensburg.

Many pervasive games fail to reach the masses because they are depending on specific sites (as REXplorer is), social situations or times; or because they are event- or campaign driven and irreproducible; or because they are enforcing socially inappropriate behavior onto players in public space, such as running, costuming (see Body) or role-playing.

In comparison, interweaving pre-existing social, spatial and temporal topologies and everyday behavior with pervasive gameplay may serve as a key to commercial success or game attractiveness. A game can pepper, amplify or enhance a given situation or procedure with the help game mechanics, yet without aiming to break given everyday circumstances. For example, REXplorer takes advantage of the tourist situation, during which, typically, groups of leisurely-oriented people attempt to visit and learn about a defined set of sites during a limited amount of time. Another example, the location-based social networking game foursquare (2008), rewards city exploration and activities as well as meeting new people with points and badges. Thereby, the game capitalizes on present urban networking patterns such as friend finding, going clubbing and discovering as well as sharing places and activities. In fact, both REXplorer and foursquare quasi "ludify" pre-existing patterns, flavoring them with uncontroversial and playful, but alike behavioral patterns. I call this type of game design technique the simile principle, cf. the chemical rule similia similibus solventur, or the homeopathic rule similia similibus curentur.

31. Mobility

In 2005, on the side of a heavily trafficked federal highway just outside of Regensburg, a man-sized poster courtesy of the Bavarian road safety association warned the Homo (Ludens) Digitalis that though driving fast may feel fun and quite game-like, it may have an irrevocable consequence: – "Game Over", see Figure 58. The road sign refers to the meme of a computer-like interface; it concerns an actual automobile, but acknowledges the illusory similarity of driving that automobile and playing a racing game, a game of contest and risk-taking, where in real life, losers pay the highest price – death.

Whereas the game that lures behind the street sign promises vertigo from high-stakes play, in these times of rising petrol prices, a different car-related activity, hypermiling, has become a game-like achieving and contesting activity in which car drivers strive to squeeze as many miles as possible from a tank of gasoline[63].

Mobility, in fact, mobilizes the magic circle, and it can be abstract and concrete. Mobility enables contests, signifies the way a plot progresses, and can have a visual gestalt or an auditive one. Without mobility, perspective would not have a before or an after. Mobility creates play functions related to movement. Mobility is the concrete expression of kinesis on a play-ground: through mobility, we perambulate space and time.

Mobility plays a major role in the way we, playfully, learn the World. Jean Piaget (1951) illustrates how the development of motor skills and the development of cognition in children interrelate and cannot be separated from one another; sensomotorical intelligence, and also more general traits of intelligence, fundamentally result from motor function and experiencing the world through movement. Piaget explains that it is during the "sensorimotor stage" (Piaget 1992:49), which spans from

birth to the age of two, that this type of intelligence is acquired, when the child rehearses reflexes, develops habits such as thumb-sucking, grabs with the hands, and begins combining prior motor skills to actively experiment and play. Ultimately, the child leaves behind this trial and error phase, once he has become capable of playing games with more complex rules. From an adult's perspective, children's movements are, as mentioned earlier, often unjustified, undue, and repetitive (Buytendijk 1956:294ff.). But from the perspective of a child, it is precisely these factors that make mobility highly enjoyable because through movement, children experience the world.

More rigorously, then, and in agreement with mobility researchers Zoche/Kimpeler/Joepgen (2002:7), we define "mobility" here as follows:

Mobility

The potential for movement and the execution of movement.

The first aspect of the definition underlines the fact that mobility implies that a person's Body, an object, or, alternatively, a space are mobile (and in reverse, that this mobility is the condition of being mobile). The second aspect describes the actual concrete movement of people, objects, or spaces, i.e. the process of change of an entity from one unit of a described system to another unit. The two defining aspects are reciprocal: without the condition of mobility, actual mobility cannot take place, and without actual mobility, the condition of mobility is worthless. Together, the two aspects create what we can call a mobility-space. For a defined system with a set of actors and a set of elements, such a space embodies all possible movements and all actual movements.

But what are the dimensions of mobility? What kinds of mobility can we identify? Below, we've grouped the major kinds:

- **Anthropological: Michael Gleich (1998) traces mobility as an anthropological constant, claiming a Homo Mobilis for whom mobility is an exigency, a capability, and a desideratum (1998:13). This way of looking at mobility certainly resembles Piaget's constructivist stance, and it remains the core of all mobile play-grounds.**
- **Physical-geographical: In geographical space, physical mobility can be a property of people or things, and people's mobility can be caused by migrational, vacational, or leisurely everyday activities (Zängler 2000:20f.). This kind of mobility implies a positional change between spatial units, of which games can take advantage. Physical movement of people, then, can be interesting particularly for health game purposes – for example, to resolve obesity[64]. Another starting point for designers can be reoccurring route patterns, for example commuting between home and work.**
- **Social: Individual or societal changes between groups, strata, or classes, which take place over time (i.e. intra- or intergenerationally).**
- **Formative: John Urry (2000), somewhat combining several of the approaches cited above, argues that as spatial metaphors and processes, mobilities are at the heart of contemporary social life and should therefore be at the center of 21st century sociological analysis. Travelings are thus constitutive elements of the structures of western Society and cultural identity. They can be corporeal, object-related, imaginative, or de-materialized, i.e. virtual. Nigel Thrift (2004) even envisions that continuous and ubiquitous numerical calculating alters our understanding of how we relate, so that "the nomadologic of movement becomes the natural order of thought" (Thrift 2004:590), which Thrift calls the "qualculative sense" (ibid.). In an earlier study of spatial formation, Thrift shows, for example, how the railway has been exceptionally important in the shaping of modern mobility, remodeling our existing relationships to landscape, space, and time. The railway has familiarized the masses with machinery outside of the workplace, it has democratized longer-range travel, propelling passengers through space, and it has, as a Technology of power and quite like a projectile, pierced, bridged, framed, bypassed, amplified, and degraded physical space – in other words, disciplined and dominated it (Thrift 1996:266ff.). Urry, transposing Thrift's railway observations onto the notion of the flexible and wholly coercive car, which "reconfigures civil society involving distinct ways of dwelling, travelling and socialising in, and through, an automobilised time-space. Civil societies of the west are societies of automobility" (Urry 2000:59). When we were kids sitting in the back seats of cars, we played games like "I spy with my little eye," but tomorrow, our backseat kids will investigate crime mysteries designed to span vast areas along the road network, while they travel at automobile speed and look**

out of car window. Even today, just such a mystery exists in prototype form: the game prototype The Journey, which links a GIS module to a narrative engine (Gustafsson et al. 2006).

In all the ways that we play while driving, riding the train, or talking to others on our mobile phones, mobility is the play-ground of delightful discovery. Maybe it is because of this that Urry realizes, without explicitly mentioning Foucault, that the ship is the most remarkable mechanism (and metaphor) for mobility, travel, and possibly, travel encounters: "Mobilities that pass over the edges of society, through and into the "other"" (2000:48). The nature of mobility, we see, is heterotopian; whereas in the Baroque era, architecture, theater, dance, and music deceived eye and ears by "moving" the senses with the help of illusions (Oechslin 2007) (see the Trompe l'œil entry in this inventory), the fluids of the 21st century are made up of "the remarkably uneven and fragmented flows of people, information, objects, money, images, and risks across regions in strikingly faster and unpredictable shapes" (ibid.).

These flows, then, allow for the creation of flow games – games that take advantage of existing flows or create new ones. In a time when physical mobility based on vehicles is becoming more expensive due to rising energy prices (or, seen another way, reduced resources), other mobility vehicles will have to enable intellectual, mental, emotional, communicative, and, naturally, ludic mobility.

32. World

In the 1960s, architect R. Buckminster Fuller proposed the World Game (WG), a conceptual design-scientific approach to creating an Integrative Resource Utilization Planning Tool on a grand scale. With it, Fuller eventually hoped to "find the specific means of making five billion humans a total economic and physical success at the earliest possible moment without anyone being advantaged at the expense of another" (Fuller 1971:2). Fuller called his vision a game in order to underline the fact that it would be accessible to everyone because it would be unburdened by the political ideology and economic interests of an elite class. His ultimate goal was to achieve world peace by providing the highest standard of living to everyone on the planet, continually and sustainably (1971:89).

Fuller suggested that the WG be the focus of the US pavilion at the EXPO 1967 fair, where it would be housed in a Fuller-typical geodesic dome with a diameter of almost 80 meters. As in many military gaming systems, which Fuller had experienced personally (1971:4), a giant Map of the world located inside the dome would be connected to a computing system with a comprehensive database storing and processing knowledge about abundant and scarce world resources, needs, and problems gathered from satellites and other sources. Possible WG objectives included:

- **Communication: "Availability to all mankind of means to communicate with anyone wishing to be communicated with at the highest rate of economy and efficiency" (1971:112).**
- **Education: "Make available the best comprehensive education in all spheres of life for all mankind; and to anyone who wishes to learn anything, everything pertaining to his special interest" (1971:113).**
- **Energy: "Make available enough energy for the healthful internal and external metabolic functionings and satisfaction of Spaceship Earth and all mankind living and to be living at the highest rate of economy and efficiency" (1971:113f.).**

Neither the EXPO version of the WG nor any other facility-related version of the WG was ever realized, but many World Game workshops have been conducted ever since to help set Fuller's Spaceship Earth metaphor on course. Indeed, Fuller never intended the WG to be just a temporarily employed problem-solving tool in the style of planning or strategy games. Rather, he envisioned realizing a permanent real-time computing system based on noble and, in his time, not-yet-feasible goals. To some extent, the Internet today has grown into what Fuller envisioned many decades ago: a worldwide, real-time Technology network that "makes the world work, making mankind a success, in the most efficient and expeditious ways possible" (1971:95). Fuller's WG may have inspired cybernetics experts Stafford Beer and Fernando Flores, who in 1972 in Santiago, Chile, designed a computer-rich control room to assist president Salvador Allende in determining and steering the socialist economy of his country (Himmelsbach 2007:412).

The ludic space of the WG, we see, is not just Spaceship Earth (the title of a book Fuller authored) or its computer simulation. It is both. Therefore, it is legitimate to think of the WG as the ultimate, largest possible play-ground in the age of pervasive computing – a play-ground of Possible Worlds where all play types are legitimate, even if

subordinated to the great systemic goal, and where the pleasure consists of collective and constant problem-solving and achieving.

33. Outer Space

In Spacewar!, one of the first digital games, developed in 1961 by MIT students on a DEC PDP-1 computer, a circular, dark Type 30 Precision cathode ray tube with a dotted, yet accurately modeled night sky serves as the setting for an outer space battle and as a major inspiration for many digital games to follow.

Outer space is the play-ground of many infinites:

- **It is the location of infinity and its allegory (in itself allegorized when compressed into a game); outer space programs six degrees of freedom.**
- **Typologically, this space does not need many visual elements to be universally understood.**
- **Potentially, zero gravity and the sheer size of outer space allow for infinite Mobility.**
- **The core function of outer space in games is to provide an open space with some hindrances that must be overcome, such as meteoroids and an infinity of potential enemy or benign species – an infinite dystopia.**
- **The movement enabled by the heterotopian space ship that goes to places where no one has ever been before.**

The play-ground of outer space embraces and embodies all other play-grounds, possible and impossible worlds that we are not yet capable of comprehending. It also implies an inner space and as a result, is implicitly connected to all other Play-grounds.

34. Technology

We know that there is a particular affinity between games and computing technology that has led us to state that all gamespaces represent, at least conceptually, rule-bound digital spaces in which conflictive, goal-oriented player interaction takes place. We have briefly discussed the enjoyable qualities of technology, finding that play interrelates with the technology through which it is expressed, and we have regarded game technology as a vehicle of architectural experimentation. The latter view is obviously accompanied by the finding that "entertainment is a key driver for development of technology" (Cheok et al. 2007:128). But what is the play-ground of technology? How is technology ludically spatialized? Let us look at three exemplary perspectives, which also help to clarify notions of technology and how they affect the way a ludic architecture unfolds.

In the previously mentioned tourist game prototype Spirits of Split (SoS), supervised by the author and co-developed during a 2004 game design summer school class conducted on site in Split, Croatia (cf. Walz 2006a), "low" technology was used to create a gamespace for the player. In the game, the tourist player only stays an average of two hours in Split's ancient city center, a former Roman palace. Because temperatures easily reach 40°C during the high season, the site is crowded and narrow. In SoS, actors wearing historical dresses are therefore distributed in the play area at easy-to-reach plazas, where they hand out cubes that represent their historical eras. Tourists can collect six different cubes, which they then place in a box that they can keep as a souvenir. City center, cubes, and costumed actors (singing or performing historically accurate songs) all provide lightweight and technologically unobtrusive entertainment appropriate for a laid-back Mediterranean environment.

The "high" technology – i.e. technology-centered – perspective represented by Benford/Magerkurth/Ljungstrand (2007:248) cites pervasive games such as Can You See Me Now? (2001) as examples of hybrid environments built upon a blend of recent technologies, combining the location-based and, typically, public nature of gameplay. In the example game, CYSMN?, up to 20 online players are chased through a virtual 3D city by up to four players who move on the actual streets of that city, running to capture the online players in the virtual representation of the city. The physical runners are equipped with GPS and GPRS enabled handheld computers that show all player positions on a digital map application. Online players (who move at a fixed maximum speed) can send text messages to other online players as well as to the runners; runners communicate with each other over a walkie-talkie channel, verbally and contextually transmitting their current urban status, which is then broadcast online. This audio stream "defines the game; because they are privy to the runners' talk, online players are quite adept at avoiding their pursuers, effortlessly leading them up and down hills or through crowded public spaces" (Benford 2007:258). The gameplace – i.e. the area where the game is physically played, where it takes place – of CYSMN? is both

the actual city and the places where online players play; in other words, it is distributed across a network. The gamespace of the game – i.e. the space wherein the game takes place – is primarily virtual for the online players and physical for the runners. Yet each group is provided with information from the other realm, making the experience for the chasers physical-virtual and that of the online players virtual-physical. Together, the game group experience – and the gamespace it creates – is hybrid, and only made possible because of technology. Similarly, noted game designer and theorist Jane McGonigal, argues that CYSMN?'s gameplay renders the role of games in society as a form of "colonization" (McGonigal 2007:233) of players, objects, and environments in the name of ubiquitous computing.

An appropriative, game-centric perspective on the spatialization of technology can be traced with the help of game designer Gregory Trefry, who asserts that the core challenge for ubiquitous game designers is "to find the right technology to fit the game" (Trefry 2007). Trefry leads us to understand that it is not necessarily a certain technology that makes a good, i.e. well-designed and playable game, but that a certain type of game affords an appropriate technological solution.

We can call the aforementioned technology affordance the technological decorum of the technological play-ground. In the case of pervasive games, this affordance shifts away from the application domain of pervasive games looking to superimpose physicality with aforementioned "computing functionality" (Magerkurth and Röcker 2007:6). Instead, this affordance implicitly considers all technology – old, new, or experimental – as a means to create a certain kind of gameplay experience: "Many games find interesting ways to repurpose existing technology and infrastructure" (Trefry 2007).

In Payphone Warriors for example (a game co-designed by Trefry in 2006 for the New York City based Come Out and Play Festival of ubiquitous games – cf. www.comeoutandplay.org/blog), the initial design goal of the game was to create an on-site experience during which teams of players could try to claim territory in a physical city. Trefry and his co-designers ended up settling for an interesting and appropriate technological solution that catered to the game's high concept: because GPS receivers proved to be too costly and too imprecise in the urban canyon of Manhattan, payphones, which feature a unique caller ID and have a fixed location, were chosen instead to serve as checkpoints in the game. Players in teams of four claimed a checkpoint by dialing the game server from the payphone and punching in their team's number. The goal of the game was to control as many payphones as possible during the 30 minutes of the gameplay session by making calls, listening to the pre-programmed audio feedbacks, and moving around in the game area outlined by the layout and position of the payphones (see http://payphonewarriors.com and Trefry (2007)). Figure 59 shows the map of the game played during the Come Out and Play Festival along with its rules.

Whereas in CYSMN? and other games that take advantage of ubiquitous computing research, technologies are often used to demo technological novelty, Payphone Warriors takes a somewhat different approach. The game not only takes advantage of a somewhat outdated, yet pre-existing technology and, more importantly, a functioning hard- and software infrastructure that caters to the game's design task and thereby reminds the player of the existence of a seemingly outdated means of telecommunication. The game also makes a case for low-technology being capable of solving a typical ubiquitous game problem – that of exact positioning, territorial control, and atmospheric orchestration. In Payphone Warriors, the core technology of the game fulfills several functions:

- **A spatio-contextual function: Plotted onto a top down map of midtown Manhattan, the payphones serve as vertices of the gamespace. At the same time, the payphones are part of a seemingly antiquated, yet ever present networked and urban system that is brought back into the player's spatial perception via the game.**
- **An enabling function: The payphones, without even being a novel ubiquitous technology, create a hybrid gamespace by combining physical location and virtual phone network in one ubiquitous gaming experience. The example of Payphone Warriors demonstrates that there is no need to use ubiquitous or cutting edge technology to create a ubiquitous, accurate location tracking game system.**
- **A task function: In Payphone Warriors, the goal of the game is to claim (and control) payphones by making a call from a payphone booth. Ultimately, without the payphone, the game would lack a goal.**
- **A procedural function: The game includes a number of sub-procedures centered around the central Capture the Flag-like procedure of controlling the payphones.**

The payphones, then, not only act as positioning entities and gamespace outliners, but also as tasks and resources.

- **A social interaction programming function: Payphone Warriors has players compete over payphones in real time. This builds physical sports-like action and a high competition model of conflict into the game because players are trying to literally hold on to their payphone banks.**

Payphone Warriors demonstrates more than just how ubiquitous games set up, control, and influence a (collaborative) ludic architecture mainly by technological means. The game also shows how a wisely chosen technology makes a game on almost every level, leading to a high degree of technology decorum and letting players re-discover abandoned urban space. SoS, on the other hand, suggests that technology should only be considered in light of the given circumstances, and that technology does not always imply computerization.

In REXplorer, the technology most visible to the player is the game controller. The form and functionality of the detector and keypad – i.e. game controller – went through many iterations before reaching its final design so that technology decorum was guaranteed. Figure 60 shows a number of detector prototypes. In a design studio class supervised by the author, a small group of students co-created the detector, seeking input from industrial design professionals as well as from a manufacturer specializing in lightweight metal bending and laser cutting. In addition to decorum aspects, there were many considerations that needed to be addressed in the design itself. For example, the design needed to:

- **house the phone and GPS receiver together in a tamper-proof, protective shell;**
- **support the atmosphere of the game by providing a look that fit the story description of a scientific detector and a feel that mimicked a techno-magic wand ready for spell-casting;**
- **provide a skin for the phone keypad to provide a customized game interface;**
- **amplify the phone's default audio volume to compensate for the outdoor situation[65];**
- **allow for quick recharging of devices.**

During the prototyping phases, different materials were tested. Plastic was the first choice, but it proved not to be robust enough. A thin aluminum skeleton was used in the final design, wrapped with a soft and stretchable textile into which the keypad layout was laser-printed in a series of 30 pieces. Professional production of this small series, as seen in the Figure, proved to be feasible, yet costly. The final design result fulfilled the requirements and was warmly received by players in the playtesting.

The use of technology (or a technological interface) as a play-ground or in service of another play-ground implies that design documentation should be written with the technology in mind. For example, in REXplorer, formal player interface state charts were important for defining exactly what text needed to be written for each character that the player could encounter. By formally flushing out the design, we were able to ensure that we had accounted for every possible game state and error condition before the narrative script was written and recorded. Most importantly, the state charts also served as design documents for the software implementation of the game engine. Figure 61 depicts an exemplary finite state machine showing the reaction to a spell cast by the player.

Technology, when permeating our lives, can affect and ultimately control all other play-grounds in order to create forms of ludic architecture. For example, technology simplifies the generation of Possible Worlds and Impossible Worlds, equips the Body for novel types of play, and lets us control natural space for ludic activity. Technology automates Tessellation and organizes a game Board. Technology shapes and enhances Caves as well as Labyrinths (and mazes). It enables us to design and map playful Terrains as well as enhancing our Playgrounds. It turns our Campuses into exciting adolescent play-grounds, and much, much more. Technology is not only a tool or a medium of play, games, and their space today; it is, increasingly, a conditio sine qua non that must exert control to empower the pleasure-seeking player.

35. Ambiguity

What if it is unclear where, when, how, or with whom to play if the locative and possibly other dimensions of ludic space are ambiguous[66] – if, in other words, we cannot make out a play-ground? How can such a play-un-ground be, which spatially links nowhere and is not linked to from anywhere else? In our pool of possible architectural formats that embody ludic qualities, this last entry addresses what can be called the "disclosure problem."

In fact, game design researcher Markus Montola argues that pervasive games such as REXplorer exhibit an "ambiguity of expanding beyond the basic boundaries of the contractual magic circle" (Montola 2005:1). Montola further argues that games that have been grouped under the concept of pervasive games "do not have a single common denominator making them pervasive, though each of them has salient design features systematically working their way out of the magic circle of play" (2005:1). Montola holds that pervasive games consciously take advantage of the expansion mentioned above, and that it is the resulting "uncertainty" (ibid.) that is the defining signature trademark of the pervasive game. According to Montola, a pervasive game can thus be defined as "a game that has salient features that expand the contractual magic circle of play socially, spatially or temporally" (Montola 2005:3). Montola also underlines that none of the mentioned expansions necessarily affords technology, but that they can appear in mixed form to produce genuine experiences. As we have seen in the preceding section, technology can appear in many forms ranging from low to high.

Staffan Björk, one of the designers/researchers behind the pioneering pervasive game Pirates![67] (Björk and Ljungstrand 2007:256f.), supports Montola's view and suggests expanding his three-layered ambiguity-based definition. According to Björk, the pervasiveness of a game can manifest itself not only through spatial, temporal, and social ambiguity, but also in the form of interface-related interaction ambiguity (Björk 2007:277f.).

However plausible the argument is, note that Montola does not differentiate between the terms "uncertainty" and "ambiguity," but rather uses them interchangeably (in contrast to Montola, Björk uses the term "ambiguity" only, but remains unspecific as to what it exactly means). In our context, the meaning of (and difference between) the terms ambiguity and uncertainty seems to be rather ambiguous or uncertain itself. Therefore, let us seek to make the ambiguity play-ground more precise in order to frame the ludic architecture that it engenders.

Strictly and economically speaking, game(spaces) of uncertainty are situations in which a player is unable to securely forecast future states of a game she's playing, i.e. the player must make incalculable decisions: kinesis under uncertainty. As opposed to a risky game such as a state lottery, in which at least the odds are calculable, in a game of uncertainty, the player – who acts as the decision-maker – only knows the relevant states that depend on her choice(s) in the game and may potentially occur. Still, the player cannot judge the likelihood that these states become reality. In a state lottery game, by contrast, the player knows or, with a little effort, can easily calculate the probability distributions. This somewhat rational perspective on gameplay has been further mathematized by John von Neumann and Oskar Morgenstern (1944), whose monumental treatise propelled the Theory of Games and Economic Behavior into the mainstream of economic thought and well beyond. Von Neumann and Morgenstern also helped to establish the theory of games as a sub-discipline of decision theory, which incorporates "theories of preference, utility and value, subjective probability and ambiguity, decision under risk or uncertainty, Bayesian decision analysis, probabilistic choice, social choice, and elections" (Fishburn 1991:27). As the quote shows, decision theory is of particular interest to those aiming to refine Montola's interchanging of ambiguity and uncertainty.

Decision theory distinguishes three key decision-making situations that help us to explain, analyze, and model decision-making:

1. **Risk situations: Situations in which the decision-maker knows potential outcomes as well as their odds, i.e. their probability distributions (Knight 1921). Example: A player participates in a state lottery game, which has calculable odds.**
2. **Uncertainty situations: Situations in which the decision-maker knows potential outcomes, but there are odds (Tversky and Wakker 1995:1270). In uncertainty, according to Knight (1921), the player has imprecise information.**
3. **Ambiguity situations: A class of choice-situations where outcomes are ambiguous because the odds are ambiguous (Ellsberg 1961). Daniel Ellsberg had shown experimentally that when gambling, many people sometimes prefer to bet on known rather than unknown or vague probabilities, thereby violating the expected utility prediction put forth by Savage (1954) and serving as proof of the phenomenon of ambiguity aversion. Much later, C.R. Fox and Amos Tversky (1995) showed that ambiguity aversion occurs only when the choice set allows the actor to compare the ambiguous proposition with another, less vague proposition. In other words, ambiguity aversion depends both on the source of uncertainty and on the degree of uncertainty (Tversky and Wakker 1995:1255). In addition, it has been shown that a subject's measured ambiguity aversion is related to his or her**

psychological tolerance for ambiguity, i.e. the less tolerant a player is of ambiguity, the more the player prefers to know the odds (Sherman 1974:169). As opposed to uncertainty, which is not necessarily avoidable, ambiguity – a synonym for vagueness – is always avoidable.

The preceding list implies that at least the first two decision-making situations can be derived from the relationship between decision and outcome / odds. By creating a matrix (see Table 10), we can, however, derive even more decision-making proto-situations. These are listed below and tentatively named for the sake of completeness, but are not further discussed:

1. **Possibility situations: Situations in which the decision-maker does not know the exact nature of potential outcomes, but knows the odds of those outcomes.**
2. **Zero feedback situations: Situations in which the decision-maker knows neither the outcomes nor the odds of those outcomes materializing.**

Ignoring, for a moment, situation number three (i.e. ambiguity situation), we can think of another outcome–probability relationship that is not subject to degrees of insecurity:

1. **Certainty situations: Situations in which outcomes and associated odds are completely predetermined (Fishburn 1991).**

DECISION		PROBABILITIES ASSOCIATED WITH OUTCOMES	
(3) Ambiguity		Known	Unknown
EXPECTED OUTCOMES	Known	1 Risk	2 Uncertainty
	Unknown	4 Possibility	5 Zero feedback

Table 10

An overview of relationships between decision and outcome / odds.

As can be seen, in each of the categories 1 to 5, probability plays a defining and standard role in insecure decision-making processes and has thus been chosen for the sake of argumentative clarity. Still, the question remains of whether or not probability could be replaced by an alternative in decision theory.

In the field of game studies, uncertainty is an agreed-on term used to express a feature designed into games in which chance is central to play. Caillois, for example, classifies chance-based play alea as one fundamental category of ludic activity – i.e. "all games that are based on a decision independent of the player, an outcome over which he has no control, and in which winning is the result of fate rather than triumphing over an adversary" (Caillois 1962:17). From Callois' category, it generally follows that uncertainty is the result of chance, and that chance can be a game's main feature – a feature that some games have in common and that allows for these games to be grouped and categorized.

Notice how in the quotation cited above, Caillois considers chance to be a gameplay progression factor that is entirely player-independent, ascribing a passive, control-less role to the player, who needs no further resources or skills in order to play. Salen and Zimmerman disagree with this depiction of games of pure chance, pointing out that Caillois may accurately describe the emotions of some players while playing a game of chance, but that "even in a game of pure chance, a well-designed game continually offers players moments of choice. Meaningful play requires that at some level a player (...) is making choices with meaningful outcomes" (Salen and Zimmerman 2004:179). Merely casting dice and waiting, trembling, to see the result, as Caillois has observed, does not result in meaningful play. If the outcome of a game has been predefined, no meaningful play will arise for the player.

Salen and Zimmerman hence argue that games of pure uncertainty – that is, games whose outcomes are completely unknown to the player and in which no player choice exists at all – are neither widespread nor much fun to play.

In our second example of how the word uncertainty is used in game studies, Salen and

Zimmerman, although rejecting games of pure chance as quasi unplayable, argue that "uncertainty is a central feature of every game" (2004:174), thereby claiming that there is an intrinsic bond between uncertainty and the authors' concept of meaningful play. In their schema, which highlights games as systems of uncertainty, Salen and Zimmerman break down the relationship between a game decision and a game outcome into three degrees of uncertainty, i.e. types of mathematical probability. This model differs slightly from the decision theory-based model that was introduced earlier:

- **a certain outcome is entirely predetermined;**
- **a risk is an outcome with a known probability of taking place;**
- **an uncertain outcome is entirely unknown to the player (2004:189).**

Salen and Zimmerman argue that in all games, even games of skill, the overall outcome of a well-designed game is uncertain for the player; on a macro-level, all games possess uncertainty (2004:174).

How the player ultimately experiences uncertainty, however, may not necessarily correspond to the amount of mathematical chance designed into the game: "Uncertainty is in the eye of the beholder, or perhaps, in the play of the player" (2004:187). For example, assume a single standard six-sided die, with each side of the die showing one number from one to six. When cast, the chance for each side to appear is 1/6, or 16.67%. When all chances are added up – 6*16.67% – they total 1, or 100%. In Das grosse Buch der Würfelspiel (Knizia 2000), game designer (and mathematician) Reiner Knizia calls the numbers one to six the elementary outcomes, which are, as can be seen, not only equally likely to appear, but which also represent the possible set of basic outcomes that a player's cast can produce (2000:51).

Let us imagine a simple dice game that requires a single die, in which the player wins when he throws a six. The probability of throwing a six is always, for every cast, 1/6. The player can calculate this risk and thus choose to play a risk game when, for example, she bets on the next throw. The chance to succeed and thus win the bet is 1/6, while the risk of losing the bet is 5/6. However, psychologically, this kind of game can quickly take on a higher degree of felt uncertainty if, for example, the player hasn't cast a six in many throws, or if other players are gambling for the accumulated bet, or against the bank, or both. In games that feature probability elements, the player interacts with the game system, while the system – although quite formal and somewhat predictable – together with the player forms a unique and highly situational gameplay loop that grows in complexity the more players or the more dice are involved.

As has been demonstrated using examples from both decision theory and chance gaming, the play-ground of ambiguity can be made more precise and further broken down. Pervasive games may blur the locative dimension of gamespace, thereby introducing player uncertainty concerning the site of gameplay. Yet because of its game-nature, the play-ground of that game will be, naturally, subject to uncertainty in terms of outcome quantification.

In conclusion, the play-ground of ambiguity is realized whenever a game is at play; and whenever players play freely, they cannot be certain of where play may take them. In the end, and considering the described differentiation of uncertainty, ambiguity and risk, we have come full circle back to Brian Sutton-Smith's ambiguity of play (1997), and find that play is not only subject to contextual and rhetorical uses all across the sciences, but also that play and games are spatially framed.

GAME OVER! INSERT COIN.

"The real key to the architecture of gamespace,

like any other architecture, is the entrance and the exit" (Wigley 2007:486).

1. Summary

In this book, we have set out to architecturally frame play and games, both analytically and, where appropriate, designerly. We have structured the treatise according to three main sections, all of which contribute to our task of introducing the notion of a ludic architecture.

In the first section, we investigated the conceptual dimensions of the space of play, differentiating between an ambiguity dimension, a player dimension, a modality dimension, a kinetic dimension, an enjoyment dimension, and, finally, a culture and context dimension. The major finding and contribution of this section consists in a novel approach towards play that couples play with architectural thinking and practice.