

Architectural Interiors and Exteriors in Computer Games

Inga Paterson

Division of Computer Arts, University of Abertay, Dundee, United Kingdom

<http://computerarts.abertay.ac.uk>

This paper looks at the design of place in a game environment. Many 3D video games have a strong orientation to streetscape and interior design. This paper questions what can be learned from architectural insights and examines how cultural references can be used in computer games to enhance the game experience by supporting game play through a deepened sense of immersion. Focusing on the cultural ideologies of play, this paper sets out to consider the suitability of real-world building design in the creation of game-world environments, with an emphasis on how level design can be enhanced through a deepened understanding of the virtual locations in which the game challenges are situated.

Keywords: *Game-world; game-play; architectural-design; immersive environments.*

Introduction

Within the burgeoning discourse on game design, three areas of research currently invite much attention: the relationship between game play and story; the social dynamics of gaming, in particular on-line gaming; and the fast paced, technology driven area of visual fidelity in computer graphics. Enhancing the game experience is a recurring objective within each of these spheres of game-design research. This paper looks at a more neglected dimension of game research - the design of place in a game environment. It looks at what can be learned from architectural insights, and how cultural references can be used in computer games to influence level design and enhance the game experience by supporting game play, and deepening the sense of immersion.

The design of a game-world primarily supports the game-play by defining the setting and physical boundaries for the game. Game design frequently manipulates real-world rules of physics in favour of creating more engaging game-play. In the creation

of a simulated 3D game-world, architectural design methods and techniques for modelling world interiors or exteriors don't translate directly and a degree of design amplification or manipulation is often used. This paper mentions these factors and considers where design abstraction is best balanced with real-world references so that the game player can comprehend a sense of place and navigate the game world efficiently. The way in which a player interacts with a game is closely linked to the visual experience and the cultural references provided by the graphic objects as well as to the game play. This paper sets out to identify ways in which an understanding of the broader cultural aspects of play can be used as a framework to identify elements from architectural design that can be incorporated into game design, to support a more immersive and engaging game experience.

The framework adopted for this research is based on the work of Sutton-Smith (1997, p.9), a prominent scholar of play in the twenty-first century, who has set out to categorise the implicit cultural

rhetorics found in the language of play theory, which he presents as the seven rhetorics of play: progress, fate, power, identity, imaginary, self and frivolity.

Today's popular fascination with play is preceded by a lengthy literature on the subject. The intent in using Sutton-Smith's seven rhetorics of play is to test the hypothesis that understanding how architectural design can influence the player's navigation through the game environment can support game play. It is not intended to suggest that this is the definitive definition of play by disregarding the work undertaken by many respected scholars in this domain.

Architectural Exteriors and Interiors in Games

The obvious way in which architectural design meets game design is in the latter's depiction of simulated 3D game-worlds that have a strong orientation to streetscape and interior design. For example, *Grand Theft Auto – San Andreas* features street scenes from three fictional metropolises that are based on Los Angeles, San Francisco and Las Vegas. By contrast, the stage-set style environments in *The Sims* caricature suburban design.

Altogether, the physical and temporal dimensions of a game-world differ from those in the real world. They also vary according to the degree of verisimilitude demanded by the genre of game. The more a game represents the real world, the more accurately its objects, interiors and exteriors need to mimic that world (Rollings & Adams 2003, p.81). The commercial success of "realistic" vehicle and flight simulation games, such as *GT Legends* and *Microsoft Flight Simulator: A Century of Flight*, indicate the demand for an immersive but safe experience of driving and flying at high speed. Conversely, games in the *Monkey Island* series are placed in a stylised, but unrealistic visual world, that features distorted perspectives rendered in vivid colours, which sets the scenes for equally eccentric game-play challenges.

All games, no matter how visually realistic in

look, are abstracted in design and represent a modification or simplification of the real world because time, scale and physics are manipulated to suit the purpose of the game (Rollings & Adams 2003, p.62). However, an extreme degree of design abstraction in a game world can have a negative effect on the user experience; without real-world references, navigation is impaired, and it is hard for the user to comprehend a sense of place. Comprehension of, and navigation through a game environment is conditioned by life experience in spatial worlds (Roudavski & Penz, 2003). To avoid user disorientation, a game design requires enough clues from physical reality to enable users to comprehend and navigate the virtual environment (Jakobsson, 2002).

Immersion in Play

At first it would seem that game-designers, unlike architects, interior designers and town-planners, are freed from the need to comply with real world physics and can therefore indulge in unlimited choices for creating innovative, imaginary settings for game worlds. Plainly, this is not the case because game design has its own set of demanding design constraints. Generating a sense of accurate visual realism is a technological challenge, but creating the game experience is a complex design problem, which much like architectural design requires a holistic and collaborative approach in the making of design decisions.

The diverse nature of play phenomena, which extends into numerous spheres of life, has been analysed according to the disparate play interests of different academic disciplines (Sutton-Smith 1997, p.6). In the *Rules of Play*, the latest large compendium on play within the field of game design, Salen and Zimmerman (2004, p.311) state, "the play of a game is the experiential aspect of a game". The way in which a player interacts with a game is closely linked to the visual experience provided by the graphic style as well as to the gameplay. Creating a geometrically complex and realistically textured world requires a

high level of production resources and exceptional processing capacity. The next generation of games platforms has greater technological capacity to manipulate higher polygon counts and therefore promises games with a heightened degree of graphical realism. Ever greater degrees of verisimilitude in game graphics contribute to the feeling of immersion in a game but it has little worth when used only for creating a visual emulation of aspects of the real world. O’Luanaigh (2006, p.7), a senior figure in the European games industry, states that gameplay can be summed up quite simply; it’s where everything in the game feels right. This statement conceals the complex design process involved in getting a game to “feel right”. The 400 Project, led by Noah Falstien and Hal Barwood, currently lists 108 rules of game design and the eventual aim of the project is to document 400 rules.

Game Environment Design

Kalay (2004, p.456) makes the distinction between the definition of space and place. A physical space becomes a place through the intervention of human beings.

People imbue spaces with social and cultural meaning, transforming a mere space into a place; it is a sense of place, not space, that makes it appropriate to be naked in the bedroom but not classroom, and to sit at our window peering out but not at other people’s windows peering in... Places frame our actions by providing cues that organise social behaviour in the world.

We have been conditioned from birth to interact with the natural world and have learnt to interpret the social and cultural cues associated with our built environment. Choices about the design and organisation of game places have consequences for both the game play and the narrative coherence in a game. Game worlds do not need to adhere to real world physics but ignoring social and cultural cues associated with the natural world increases the challenge for game designers to create a believable

world that avoids causing boredom or frustration and actively works to keep the player involved.

In his essay, Jenkins (2004) bridges the divide between the Ludologists, who argue in favour of the mechanics of game play, and the Narratologists, who prefer to consider games in the context of other storytelling formats. Jenkins favours the theory that games are spaces rich with narrative potential, where the rhythm of the game play can be varied through features of the game environment. He contends that memorable moments in games depend on sensations or perceptions as well as narrative hooks. The generation of a compelling place results from the interplay between, the overall aesthetic, the game play function and the emotional impact on the player. The topography of a well designed game world can draw a player to established settings that create challenges by impeding progress but ultimately the environment can support the player in the successful resolution of the defined goals and conflicts (Jenkins, 2004).

The Seven Rhetorics of Play and their application to game-world design

The next section focuses on the cultural ideologies of play and proposes taxonomy of play can help form a structure for the way environmental space works within computer games and suggests how this structure can support the rules of game design.

According to Sutton-Smith’s taxonomy (1997, p. 215 & p.220) the overall concepts conveyed by the seven rhetorics of play, and the form they each take, are as follows:

1. Progress: play as adaptation, in the form of play and games
2. Fate: play as existential optimism, in the form of chance.
3. Power: play as hegemony, in the form of skill, strategy and deep play.
4. Identity: play as social context, in form of festivals, parties and new games.
5. Imaginary: play as transformation, in the form of

fantasy.

6. Self: play as peak performance or microperformance, in form of solitary and extreme games.
7. Frivolity: play as the world upside down, in the form of nonsense.

Ten rules listed in the 400 Project (Barwood & Falstein, 2006) that apply directly to the design of game worlds include:

- ID 1. Fight player fatigue; actively work to keep the player involved
- ID 3. Maintain a consistent level of abstraction
- ID 6. Provide clear short-term goals; lead the player towards goals by environmental cues
- ID 10. Maintain the suspension of disbelief; ensure the player is imaginatively involved in the game
- ID 11. Emphasise exploration and discovery; let the player figure out the territory of the game
- ID 52. Make the game design familiar, yet different
- ID 70. Provide visual weenies to draw the player towards distant but visible objects
- ID 71. Maintain consistency; things that look alike should behave alike
- ID 73. If a player can see it, they should hear it; use audio to support visual cues
- ID 83. Design levels with a back-story

Progress

A sense of progress within a game results from advancement through improved ability to confront set challenges within specified rules, and boundaries of time and space. The form of challenge is dependent on the genre of game, but in a 3D game world, spatial awareness and the ability to navigate through a simulated environment are usually basic components of the game-play challenge.

A carefully designed game environment with appropriately positioned architectural elements can focus the game play by directing or constricting the action. This can support game rule (ID 6) by providing the player with clear short-term goals using environmental cues to lead the player towards those goals.

Fagan (Sutton-Smith 1997, p.20) identified ris-

ing levels of complexity in animal play behaviours, which includes both solitary and social forms of play. Incorporating environmental features into the game that support different levels of play complexity can intensify the sense of progress in a game. The first level of play is expressed by isolated and repeated actions without defence or counterattack by others. In a game environment, providing a calm, conflict and challenge free space gives the player the chance to explore their surroundings and practice their navigation skills. Game challenges involving non-contact solo play encourage the player to move his or her avatar through the environment in a variety of ways. Pleasure can be derived from successful avatar actions such as scaling a *wall*, jumping a *chasm*, shimmying across a *ledge*, crawling through a *tight space* or squeezing through a *closing door*. In *Tomb Raider: The Angel of Darkness*, the player must navigate Lara Croft successfully through authentic looking Parisian streets, sewers, and even a creepy *subterranean catacomb*.

Complex forms of play include social play – sometimes without contact, such as chasing, and sometimes with contact, such as sparring or wrestling. The game world can be designed to enhance these forms of social play by incorporating places that encourage game-play challenges. One flees from an enemy down a *labyrinthine catacomb* in *Quake 3 Revolution*, or anticipates contest in a *sports arena* or *wrestling ring* in *WWE SmackDown! vs. Raw*, and unexpectedly encounters conflict in a scientific laboratory in *Half-Life 2* or derelict log cabin in *Resident Evil*.

Complex social play involves games with objects and features in the landscape. Examples of this type of play in the physical world include Hide and Seek and King of the Castle. In computer games, this type of social play is represented by challenges, which require, for example, the *capture of key buildings* or the use of *columns* and *shadows* cast by strategically placed *lights* to conceal players from one another. The designers of *Thief Deadly Shadows* use lighting and appropriate architectural features to create a convincing *medieval* atmosphere that requires

stealth tactics to navigate through the shadowy kingdom.

Fate

Dice throws and random draws are recurring features in traditional games; chance forms a big element of play. In ancient Greek mythology, a major source of concepts for videogames, the creation of the universe itself involved chance in the form of Zeus, Poseidon and Hades playing dice, respectively winning the heavens, the seas and Hell (Woudhuysen 2001, p.101). Introducing an element of chance or fate into a game can heighten excitement because the player has a passive role and cannot depend on intelligence or skill to affect the outcome.

Architectural features that force choice, such as a series of *doors*, a *maze* or a *labyrinth*, introduce chance to a game. The designers of the *Tomb Raider* series manipulate the player's perception of the environment by *camouflaging* certain routes, by forcing decisions to be made about locations featuring shiny or dull textures and by changing the perspective to lead the player's eye to situations that require impulse reactions.

The environments in massively multiplayer online games (MMOGs), which bring together large numbers of players, introduce an element of chance into the game through the random unpredictability of crowd behaviour. In *Everquest: Prophecy of Ro*, players who are drawn towards urban based *battle grounds* to reinforce the role they are playing, now have the option of destroying *walls* in the game environment to affect the outcome of tribal conflicts.

The recurring themes in games of sorcery and magic reflect real life attempts to influence fate through divination, prayer, superstition, and gambling. The game strategy in *Black and White 2* compels the player to make moral choices to rule over the entire game *world* as a good or evil deity. This technique helps fight player fatigue (ID 1) and keeps the player actively involved because their every decision can affect the buildings, flora and fauna to reflect the player's moral choices (Lionhead, 2005).

Power

Hegemony in games is established through forms of contest, which demand physical skill and/or intellectual strategy. In both solitary and social play progress is often rewarded by objects that give the player additional power to confront the challenge or to augment the player's score. MMOGs demonstrate group play where there is a contest and struggle for superiority between opposing factions. Equally, collaboration is often a feature of group play.

Architecture in the physical world has long been used as a tangible mode of expressing the ancient ideology of power. Buildings have been analysed within the context of power relations, and history shows many examples of where extreme forms of architecture have symbolised extreme forms of power.

In games, virtual world design tends to copy real-world methods of symbolising levels of power through the built form. It does this principally with architectural scale, complexity and ornamentation. *Grand Theft Auto: Vice City* features a vast cityscape that is based on Miami where *ownership of property* becomes a key element in the game to establish domination through glamour, power and corruption. The Walt Disney Imagineers use visual "weenies" in theme park design to draw crowds through the parks towards distant but visible objects at featured central locations. (ID 70). This device is used in *Vampire: the Masquerade - Bloodlines* where the central antagonist resides in the *high-rise*, Venture Tower in downtown LA, where he commands the population from his *penthouse* office. The height and ever-visible presence of the building reminds players of their established place in the game society (Wikipedia, 2006).

Identity

The overall concept conveyed by the identity rhetoric is play as social context. MMOGs, which enable thousands of players to play in virtual worlds, demonstrate interesting instances of how identity can be expressed through play. Complex social dynamics

have evolved within these virtual communities because of the immense popularity of these games. A deeper analysis of the convoluted nature of online identity is beyond the scope of this paper. However, within the context of seeking instances of virtual architectural design that support the identity rhetoric, then good examples can be found in MMOG environments in the form of *virtual cities and villages* which mimic real world forms of community bonding. Each realm in *World of Warcraft* includes *towns, forts, outposts and cities*. Every major city represents the capital and social hub for the races that inhabit them (Blizzard, 2004). The strong back-story (ID 83) associated with each of these places provides a sense of unique character that helps differentiate one place from another. Certain buildings in the fictional world perform easily identifiable functions such as *transportation hubs, banks, taverns and shops*, that provide the player with familiar, real-world, rules of behaviour. Whereas other locations which have a specific purpose in the game environment, such as *combat-areas* and *class-headquarters* are associated with less recognisable forms of social convention that have to be learnt from within the context of the game (ID 52).

Imaginary

The imaginary rhetoric is play as transformation, which takes its form through fantasy. It could be argued that all genres of video games contain an element of fantasy based on the game's degree of design abstraction. In Kalay's (2004, p.466-469) terms this ranges from the design of "hyperreality cyber-spaces" that attempt to mimic the physical world, through to highly abstract worlds, he describes as "hypervirtuality", where all real world references are intentionally disregarded. Good game design should ensure that the chosen level of abstraction is consistently maintained and objects that look similar in the environment should behave in comparable ways (ID 3 and ID 71).

In this category, imaginative use of metaphor can be employed to express real world occurrences.

Visionary environments can result from a deliberately playful approach to the design by exploring "elements such as reversal and inversion, exaggeration, paradox" and by "playing with boundaries...infinity, space and time" (Rollings & Adams, 2003).

Darwinia combines metaphors to create an innovative game based on a virtual theme park set inside a computer network where the task is to stop a virus from destroying the world. The fractal-generated landscapes, although abstract in appearance, provide sufficient cues for the player to navigate the environment without getting frustrated or lost. *Psychonauts* is a wildly, surreal action-adventure game set mostly in the minds of bizarre characters where each mental landscape is represented by recognisable but distorted themes such as a war-torn battlefield or a twisted version of a 1950s suburban neighbourhood.

Self

Sutton-Smith (1997, p.173) states the rhetorics of the self in play theory focus on play as having its basis in the psychology of the individual player. This he describes as play as peak performance or micro performance where play occurs as an optimal experience that is intrinsically motivated to gain escape and release. A critical factor in the pleasure of playing is the degree to which an individual becomes absorbed in play. Good game design can intensify the player's absorption by supporting the illusion of being immersed in an alternative universe. While a game world may have its own laws of physics that don't apply in the real world, applying these laws consistently is a key issue in maintaining the player's suspension of disbelief. It's important to avoid including unnecessary features within the context of the game because their presence can destroy the illusion of the game. The designers of *Beyond Good and Evil* have created a visually and emotionally rich *place* by carefully considering the overall mis-scene. The atmospheric surroundings created by the lighting and texturing is made even more intimidating by the ambient and game sounds (ID 73).

Characteristics of play most relevant to the self-rhetoric include a loss of self-consciousness during play where the player becomes so absorbed other realities are forgotten. Attention is focused on the relevant operations and motivations that are bounded by the rules of the game, making everything outside the play immaterial. A feeling of control over actions and of the environment is a necessary quality for this type of play. In a racing game such as *GT Legends*, the player strives for peak performance by developing skills in negotiating the *race circuit* and other classic racing cars at breakneck speeds. Attention to detail in the accuracy of the racetracks and car designs, combined with the convincing depiction of engine and associated car sounds unite to immerse the player in self-absorbed play.

Frivolity

The core of play from this stance is based on nonsense and inversion (Sutton-Smith, 1997 p.201). A frivolous expression of architecture can be seen in follies built purely for the whimsical pleasure of a wealthy owner. In games, the deliberate inversion of real-world expectations can lead to pleasure through surprise and nonsense, or black humour through grotesque realism.

Frivolity can also be incorporated into game design in less obvious ways. Environmental features that could be seen as being frivolous from an architectural design perspective could enhance the player's experience by supporting progression through a game. Nintendo has managed to maintain the successful formula of their *Super Mario Brothers* series. One of the winning features of this amusing action adventure game is the deliberately fantastical and colourful environments where real world conventions are subordinate to playful rules such as *transportation* through *warp pipes* concealed in a *mushroom kingdom*. An essential factor in the rhetoric of frivolity is that, "players feel they can transcend reality and indeed morality" (Sutton-Smith, 1997 p.213). Kalay maintains, "conceptual

appropriateness is the measure of the fit between the environment and the inhabitants' expectations. Such expectations are a matter of social conventions, cultural norms, education and ethnicity" (2004, p.460). Game scenarios that challenge social conventions deliberately test the moral convictions of the player often by using black humour derived from gross situations. The *Grand Theft Auto* series has acquired notoriety for pushing the boundaries of what is morally acceptable within a game environment. Nonetheless, the success of the games in the series attests to the enjoyment that can be found in pretending to behave in ways that disregard normal social conventions by player the role of a criminal in a big city. The game scenarios are based in *urban* scale boroughs linked by transportation systems that feature recognisable *tourist areas*, *business districts* and *urban shopping* neighbourhoods. The resemblance to authentic places provides cues to the player that the social behaviour in the game is at odds with their cultural norms.

Conclusion

Places within games provide settings for complex and rich events (Kalay 2004, p.470).

The design and organisation of game *places* must include some recognisable social and cultural cues to enable users to comprehend and navigate the virtual environment. While it is obvious that Sutton-Smith's seven rhetorics of play is not a definitive list, recognition of the cultural rhetorics of play can provide an alternative starting point for the design structure of a game environment. Physical architecture offers the game designer metaphors for virtual worlds that have meaning based on experiences people associate with them. Combining the cultural characteristics of play with the social understandings of our built environment can help identify ways to support a more immersive and engaging game experience.

References

- Caillois R: 2001, *Man, Play, and Games*. London: University of Illinois Press.
- Ching F: 1996, *Architecture: Form, Space and Order*. John Wiley & Sons, Inc, New York.
- Crawford C: 2003, *Chris Crawford on Game Design*. New Riders Publishing, Indianapolis.
- Kalay Y.E: 2004, *Architecture's New Media*, MIT Press, Cambridge, Massachusetts.
- O'Lunaigh P.: 2006, *Game Design Complete*, Paraglyph Press, Arizona.
- Rollings A. & Adams E.: 2003, *Andrew Rollings and Ernest Adams on Game Design*, New Riders, Indianapolis.
- Salen K. & Zimmerman E.: 2004, *The Rules of Play: Game Design Fundamentals*, The MIT Press, Cambridge, Massachusetts.
- Salen K. & Zimmerman E: 2006, *The Game Design Reader: A Rules of Play Anthology*, The MIT Press, Cambridge, Massachusetts.
- Sutton-Smith B: 1997, *The Ambiguity of Play*, Harvard University Press, Cambridge and London.
- Woudhuysen J.: 2001, *Play as the Main Event in International and UK Culture*, Cultural Trends, Issues 43 & 44, 2003, pp95-145, Policy Studies Institute, London.
- Jakobsson M.: 2002, *From Architecture to Interacture*. Available from: http://www.informatic.umu.se/nlrg/to_interacture_ir3.pdf [Accessed 26 September 2005]
- Jenkins, H: 2004, *Game Design as Narrative Architecture*. Available from: <http://web.mit.edu/21fms/www/faculty/henry3/games&narrative.html> [Accessed 26 September 2005].
- Roudavski S. and Penz F: 2003, *Space, Agency, Meaning and Drama in Navigable Real-Time Virtual Environment*. Available from: <http://www.digra.org/dl/db/05150.54561> [Accessed 26 September 2005].
- Barwood H. & Falstien N.: 2006, *The 400 Project Rule List*. Available from: <http://www.theinspiration.com/CURRENT%20Rules%20Master%20List.htm> [Accessed 03 June 2006].
- Blizzard Entertainment: 2006, *World of Warcraft*. Available from: <http://www.worldofwarcraft.com/info/basics/cities.html> [Accessed 3 June 2006].
- Lionhead Studios: 2005, *Black and White 2*. Available from: <http://www.lionhead.com/bw2/about.html> [Accessed 3 June 2006]
- Vampire: The Masquerade – Bloodlines. Available from: http://en.wikipedia.org/wiki/Vampire:_The_Masquerade_-_Bloodlines#Sebastian_LaCroix [Accessed 2 June 2006]
- Games:*
- Lionhead Studios: 2005, *Black and White 2*, PC, EA Games
- Ubisoft: 2003, *Beyond Good and Evil*, PC, Ubisoft.
- Intorversion: 2005, *Darwinia*, PC, Valve Software.
- LucasArts: 2000, *Escape from Monkey Island*, PS2, LucasArts.
- Sony Online Ent: 2006, *Everquest: Prophecy of Ro*, PC, Sony Online Ent.
- Rockstar North: 2005, *Grand Theft Auto: San Andreas*, PC, Rockstar Games.
- SimBin: 2005, *GT Legends*, PC, Viva Media.
- MS Game Studios: 2004, *Microsoft Flight Simulator: A Century of Flight*, PC, MS Game Studios.
- Double Fine Prod: 2006, *Psychonauts*, PS2, Majesco Games.
- Bullfrog Prod: 2001, *Quake 3 Revolution*, PS2, Electronic Arts.
- Capcom: 2006, *Resident Evil 4*, PC, Ubisoft.
- Nintendo: 2006, *Super Mario Brothers*, DS, Nintendo.
- Maxis: 2005, *The Sims 2*, PS2, Electronic Arts.
- Ion Storm: 2004, *Thief: Deadly Shadows*, PC, Eidos Interactive.
- Core Design Ltd: 2003, *Tomb Raider: The Angle of Darkness*, PS2, Eidos Interactive.
- Trokia Games: 2004, *Vampire: the Masquerade – Bloodlines*, PC, Activision.
- Blizzard: 2005, *World of Warcraft*, PC, Blizzard.
- Yuke's: 2005, *WWE SmackDown! vs. Raw* 2006, PS2, THQ.