Situations of Play: Patterns of Spatial Use in Videogames

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ABSTRACT

Gameplay always occurs somewhere. Any discussion of situated play therefore should consider the actual spaces in which we play. Yet everyday real space is also deeply embedded in the games themselves. Videogames take patterns of spatial use from reality and situate them in their spatial structure. This paper explores these "situations of play" and their implementation in representational video game environments, seeking to understand game space through its connection to real space. But because play does not exist in isolation from its surroundings this paper takes into account the way videogames are situated in the world. How game space is presented, from screen-mediated game to pervasive games, affects how the patterns of spatial use are implemented. Game space also feeds back into real space, where their intersection forms what can be termed as played space.

To understand the transfer of patterns from reality to games this paper examines games as spatial constructs, arguing that game space is architectural. Investigating the nexus between architecture and games, and using architecture as a tool to unpack spatial conditions in videogames, this paper explores how games are structured by their spatial qualities.

Author Keywords

Videogames, space, spatiality, architecture, gameplay.

PATTERNS IN REAL LIFE

Space and architecture in reality express simple patterns of use that underlie a range of sophisticated activities that occur there. Robert Venturi states, "the activities of people in cities and buildings can be seen as patterns" [24]. A children's playground is a spatial challenge; to negotiate their spaces is to go up, over, under and through extraordinary configurations of multi-colored components. A cricket pitch is a contested space on which a ritualized battle is played out, a competition that adheres to a set of spatial rules. A domestic house is a set of socially coherent nodes, where function is set out in familiar spatial arrangements of kitchen, bedroom and bathroom. To create or change a building is another form of activity.

Other forms of architecture carry symbolic patterns. A corporate skyscraper is a codified space that signifies the status and aspirations of a company. Buildings can also appear as backdrops, never entered or explored they function as elaborate stage sets, an involuntary mise-en-scene.

These patterns of spatial use are present in reality, unremarkable within their quotidian context. In videogames these same patterns are emphasized and repeated. Spatial challenges are found from *Super Mario Bros* (Nintendo 1985) to *Portal* (Valve Software 2007). This paper will look at challenge space, contested space, nodal space, codified space, creation space and backdrops as patterns embedded in real space that manifest as archetypes of spatial use in game space. By real space I mean the physical envelope in which we live. Game space in contrast is a fabricated representation of space. These patterns are fundamental to and made explicit by videogames.

GAMES AS SPACE, GAMES AS ARCHITECTURE

When we play videogames we play both in real space and in a construct of space. Espen Aarseth [1], Henry Jenkins [15] and Bernadette Flynn [9] all posit spatiality as an essential part of videogames, crucial to understanding them. One way of investigating spatiality in games is to look at game space as architecture. Ernest Adams argues that game space is "imaginary space, it is necessarily constructed by human beings and therefore may be thought of as the product of architectural design processes" [2]. As an artificial construct designed by humanity game space is a built environment. I have argued before that both representations of urban settings and natural landscapes in videogames are architectonic, as the "designer's choices of what to represent and how to represent are imposed on that landscape" [22]. Videogames are spatial constructs and the environments of videogames architectural.

Architecture refers to buildings and their construction. But architecture is about more than just building; it encompasses the activities that occur within them, including social interaction. Architecture is a cultural artefact that extends beyond the physical world, influencing activity, and carrying meaning. Architecture also refers to structure and organization. Combining the practical and physical with symbolic content and conceptual structure architecture operates on many levels. Game space is architectural in all

senses of the word. Game space is a man-made construction, a built space often composed primarily of architectural elements. The architectural object can represent intangible concepts, operating as metaphor that contains and locates concepts in game space. As an integral part of game structure and organization, game space acts as a framework defining where we play and helping to configure gameplay.

It is not enough to merely study the look and presentation of game architecture and environments. Videogames are not only spatial they are performative. According to Alexander Galloway games are actions, enacted in a cybernetic relationship between the player and hardware [12]. This relationship is manifest in gameplay, in the action, reaction and interaction of player and game. Game space must be interpreted according to how it affects gameplay. The patterns of spatial use look at how game space and gameplay work together.

GAME SPACE/REAL SPACE
It is clear that games do not exist in isolation from the spaces they are played in. Game space is always connected to lived space. Looking specifically at the situated relationship between virtual space and real space reveals different ways in which game space is mediated, three types of situated-ness. Each has a particular connection to real space.

The most familiar and widespread form of spatial simulation occurs in screen-mediated games where game space is projected on a display. Game space is accessed through an interface, visually through a screen, aurally through speakers and acted upon by the player through a multitude of control devices that act as a kinesthetic link. Clara Fernandez-Vara asserts "the screen is the basic unit of space in videogames, since it frames the interface" [8]. Game space also extends beyond the screen in what Mike Jones calls the macro mise-en-scene [18], so that game space is framed within the screen by the virtual camera. The artificial world is contained and bordered, isolated from real space. Played on consoles, computers and handheld devices screen-mediated games are historically dominant and remain the prevalent form of spatial projection.

Despite its separateness, screen-mediated game space is dependent on the conventions of real space and our experiences in it. Taking Maurice Merleau-Ponty's notion of embodiment, in which body image is task orientated and where spatiality relates to situation not position, Bernadette Flynn argues that players are conditioned by their bodily experiences in real space [10]. Movement and navigation in game space reflects their counterpart in reality. Game players inhabit game space in a subjective manner and bring to the game world their corporeal history. Spatial practice in games then becomes a cultural act. This suggests a way in which designers and players, through their unconscious familiarity with socially encoded environments, bring spatial and social practices to the game world. Game space

is situated as discrete from real space, yet remains dependant on it.

Another relationship between game space and real space occurs in pervasive games, when game space is overlaid onto real space. Using headsets and mobile technology game data is partially superimposed over an existing landscape. This intersection of real and game space is most prevalent in what Carsten Magerkurth, et al, call location-aware games, which "regard the entire world, the architecture we live in, as a game board" [21]. *Triangler* (TNO 2007) is a collaborative outdoor mobile game using GPS systems where three teammates attempt to form equilateral triangles with their bodies in the environment, enclosing enemy players. Players negotiate real world hazards as they follow player positions on their mobiles, where game space shares a direct relationship to real space.

Another form of pervasive gaming that overlays game space onto real space are augmented reality games like *Human Pacman* (Cheok et al 2004) which places virtual items into the real world. Using wearable computers and head mounted displays *Human Pacman* superimposes game objects and game patterns onto a predefined area of urban space. Players see both the real environment and virtual cookies, collected by physically entering the space that appears to contain the object. Gameplay requires the player to act within the real world and game space corresponds dimensionally to real space.

Ubiquitous games also express a variation of the game space/real space relationship in what we might call embedded games, where virtual game space is contained within a specially constructed physical space. Physically immersive visualization systems use an extraordinary real space to allow the player to be embodied with the virtual. Embedded game space can also occur when virtual objects are used within a specially constructed play space. An augmented tabletop game that uses a physically modelled landscape in conjunction with virtual inhabitants embeds gameplay in a contrived reality. Game space is placed within an artificial real space.

Embedding can also occur where a screen-mediated space is contained within a physical environment that contextualises the game. *Tamagotchi* (Bandai), literally translated as *egg-watch,* is a Sim game contained in a small ovoid carapace with a small screen showing its inhabitant. The casing is an integral part of the presentation of the tamagotchi world, the egg-shaped exterior is the environment and the screen a window. Another example is *Pixel Chicks* (Mattel), whose advertorial catch cry is a 2D girl living in a 3D world. Here a pixelated digital character is displayed over a plastic molded house, projected above the furniture. The pixel chick sits, walks and interacts with the real space of her synthetic home. Artificial game space is given an artificial real space.

PATTERNS IN SCREEN-MEDIATED GAMES

As simulations of space, videogames do not endlessly reinvent patterns of spatial use but are continuously reusing, reapplying and restructuring basic patterns that occur in reality. These patterns are not tightly scripted events but are loose formations that have arisen with civilization. They are social constructs that will diverge within different societies. They are patterns of what we *do* in the environment. Within the patterns architecture can guide and suggest, afford or impede activity and as such architecture shares a relationship with the patterns. Examining architectural diversity in representational game environments reveals a number of dominant recurrent spatial patterns in videogames. Other patterns can be found, notably social and economic spaces in virtual worlds (patterns which dominate non-gamic virtual constructs but are commonly expressed only as secondary patterns in MMO's and hence are not major videogame patterns), however the six patterns listed here describe the majority of gameplay and game space interactions.

The prevalent patterns of spatial use are:

- Challenge Space: where the environment directly challenges the player.
- Contested Space: where the environment is a setting for contests between entities.
- Nodal Space: where social patterns of spatial usage are imposed on the game environment to add structure and readability to the game.
- Codified Space: where elements of game space represent other non-spatial game components.
- Creation Space: where the player constructs all or part of game space as part of gameplay.
- Backdrops: where there is no direct interaction between the game space and the player.

The patterns of spatial use are different from Roger Caillois' typology of games [7], which are patterns of play rather than patterns that consider the spaces in which games are played in. Caillois put forward four categories of play - Agon or games of competition, Alea or games of chance, Mimicry or games of simulation and Ilinx or games of vertigo. There are some correlations between Caillois' typology and the patterns of situated play. Contested space clearly has a direct relationship with agon or games of competition. Chris Bateman finds agon in videogames appearing as fighting games, FPS games and strategy games, but also argues that player desire to defeat the challenge of gameplay can also be agonistic [4]. Taking this desire to defeat the virtual opponent into the spatial realm agon is also part of challenge space. To explore fully the overlap between Caillois patterns of play and the patterns of spatial use is beyond the scope of this paper but in intersecting they remind us that videogames are both play and a space to play in.

The patterns are solidified in videogames through the mechanisms of rules. As Jesper Juul points out "a game is a set of rules as well as a fictional world" [19]. Architecture

in videogames has no inherent qualities; even the ability of a wall to block movement must be programmed in. Rules dictate what can or cannot be done in the virtual space. Ulf Wilhelmsson suggests that there is a strong relationship between where we play and what we play, that game environments constrict and afford what it is possible to do [25]. The assigned qualities of architecture and landscape dictate how the player can interact with them and what gameplay is possible.

Rules give the game a range of possibility of play, how players actually use that space can vary from what the designer anticipated. Just as real spaces can be used differently from their intended purpose, patterns of game space can change through emergent gameplay. In reality skateboarders turn the safety of the shopping center into a challenge space, in virtuality players of *Battlefield 2* can ignore the fighting for the sheer spatial thrill of base jumping. The patterns of spatial use are not prescriptive.

The patterns of spatial use exist alongside other architectural and spatial qualities including the architectural capacity to enclose, act as a barrier, impart meaning and evoke atmosphere. The patterns of spatial use cross boundaries of spatial production and disregard technical differences, occurring in 2D, 3D, isometric and side-scrolling games alike. The presence of one pattern does not preclude the use of other patterns. They are not mutually exclusive. Each video game implements the patterns in different combinations, as major and minor components of gameplay. While many games express a dominant pattern nearly all games use a combination of different patterns. Unlike Staffan Bjork and Jussi Holopainen's *Patterns of Game Design* [5], which are patterns of commonly recurring specific elements, the patterns of spatial use look at overarching configurations of game space and gameplay.

The patterns arose in reality but have been refined and formalized in video game environments. While early videogames used simple iterations of the patterns, due to technological limitation, the trend is towards more intricate configurations of multiple patterns that link together in sophisticated ways. Games like *Gears of War* (Epic Games 2006) overlay environmental intricacy onto sentient adversary design in a tactical survival shooter. Adding realistic physical characteristics to environments and destructible environments extends player agency, integrating gameplay further into game space and driving pattern integration.

THE PATTERNS
Challenge Spaces

Overt challenge spaces are present in our urban environment yet for practical and safety reasons are isolated from everyday spaces. Discrete units like playgrounds, obstacle courses and racetracks are specifically designed for physical challenge. Games like *Tombraider* (Core Design 1996) take this type of physical challenge and exaggerate it, assimilating it into traditionally more staid architectural spaces. A room becomes a series of discontinuous platforms

across which the inimitable heroine Lara must jump. Spouts of flame erupt in a barrel-vaulted chamber. These violent executory spaces directly challenge the player's skill and reflexes forming an integral part of gameplay.

Figure 1. Architectural
challenge in *Tombraider*

In challenge space architecture is an adversary and the landscape an opponent. To remove the architectural elements from *Tombraider* would negate most of the challenges faced by the player. Challenge space shares a direct relationship with gameplay where the environment holds elements that form the core of gameplay. When the elements that form game space directly form gameplay, game space becomes gameplay. Challenge space then forms gameplay.

Challenge spaces are also more present within the everyday environment in more subtle ways. A city presents navigational challenges for which countless aids, maps, street directories and GPS systems, abound. Similarly complex environments in games often offer the same kinds of assistance, maps are a constant feature. Navigation and wayfinding are a type of environmental challenge that occurs in many games. Multiple paths, open landscapes and convoluted layouts require the player to negotiate and remember spatial configurations.

Another type of challenge space that is common in videogames yet rarely present in ordinary architecture is the environmental puzzle. Games like *Myst* (Cyan Worlds 1995) implement architecture as a cerebral challenge. Where the real world tries to minimize architectural confusion games revel in architectural complexity, resulting in improbable and bizarre buildings. More uniquely challenging are the two separate worlds in *What Linus Bruckman Sees When His Eyes Are Closed* (Vince Twelve 2006), where action in one environment is mirrored in the other, yet will have different effects in either according to the configuration of each environment.

Many games use the pattern of challenge space as their primary pattern, in particular platform and adventure games, like *Super Mario Bros.* (Nintendo 1985), *Ratchet & Clank*

(Insomniac Games 2002) and *American McGee's Alice* (Rogue Entertainment 2000). As spatial constructs most games contain some implementation of challenge patterns, particularly wayfinding. Problems of navigation and environmental obstacles, whether they require a simulated physical response by the player's avatar or an intellectual solution, are configurations of challenge space. The critical aspect to challenge space is the direct opposition between the player and the game environment. The simulated world directly challenges the player's skill, reflexes, memory and intelligence. Whether it is an active combatant, an inimical world that is dynamically trying to kill you, or a land of more intellectual tasks, challenge spaces require the player to actively decipher and understand the game environment.

Contested Spaces

In reality contested spaces are war zones, disputes over water rights to rivers, football fields and cricket pitches. Some are highly regulated contests within a formalized space, others aggressive and informal conflict. In videogames contested spaces work on a number of different levels. There are contests of resource control, or competition for resources, where players fight for domination of a limited number of supplies essential to gameplay. In *Starcraft* (Blizzard 1998) acquisition and control of the two "natural" resources, minerals and vespene gas, dictate the number and quality of combat units and buildings available to the player, thereby exerting a direct influence on the player's ability to wage war on their opponent.

Other contests of space occur when players fight for mastery and domination over all or part of the game environment, or for control over spatial objectives. *Civilization IV* (Firaxis Games 2005) can be won through controlling a majority proportion of the available land. By capturing the flags or spawn points in *Battlefield 2* (EA Games 2005) players diminish the other team's ability to regenerate dead combatants. Then there are contests of survival or victory in combat against an inimical entity whether it is a bot, the AI or another player. *Unreal Tournament 2004* (Epic Games 2004) features online death matches where killing your opponent is the only way to enter the next round. In *Star Wars: Knights of the Old Republic* (LucasArts 2003) gameplay focuses on managing a team of characters against a range of opponents. These forms of contest also translate into the idea of less violent forms of competition against other opponents so that sport games like *FIFA 07* (Electronic Arts 2007) contain contested space.

The common factor linking these variations is conflict with an opponent, where game space is a location for conflict or adversaries fight over mastery of game space. In contested spaces architecture and landscape function as settings for conflict, struggle and battle against other opponents. They are arenas of combat for virtual skirmishes over space and resources, where open conflict between entities occurs. To

remove the opponents would be to remove gameplay, leaving the player as a tourist in a pointless space.

Figure 2. Fighting in
Unreal Tournament 2004

Unlike challenge space the environment does not form the major part of gameplay. In the seminal contested space of *Doom* (id Software 1993) it is the mobile adversaries not the architecture that form the main challenge to the player. Yet the game space still has a notable effect on gameplay, channeling, influencing and being exploited by the player. Architecture plays a role in how gameplay operates and its outcomes, from choke points to providing cover. Knowledge of spatial conditions is important for player success, particularly against live opponents in online play, yet is not essential. Contested spaces range from realistic reinterpretations of historic battlefields to highly improbable layouts. The permutations of game space make combat against opponents more interesting and more difficult.

Nodal Spaces
Human society uses sophisticated architectural patterns that reveal program, or the particular activities that occur within buildings, which is linked to specific building types. We expect different activities in domestic buildings to commercial buildings. This pattern is repeated within houses, where bathrooms are for one type of activity and kitchens for another, and on a larger scale in cities, in residential to industrial zoning. Activity becomes something that is spatially separated. In *Ordering Space,* Karen Franck and Lynda Schneekloth note that both social practices and built environments use place types as a structure that distinguishes and separates activity [11]. These patterns are culturally specific but basic meanings are fairly endemic within western civilization.

Within videogames nodal space is used to provide overall structure to game space. In *World of Warcraft (Blizzard Entertainment 2004)* architecture organizes activity into discrete zones, you go inside the auction house to sell items, you go to a town to find transport. Architecture acts as a container, both concentrating activity and defining the area of activity. In a similar manner the named and visually distinguishable landscape collates quest activity. You go to the *murloc* village to kill *murlocs* and to the *orc* outpost to

kill *orcs*. Action is tied to location. The architecture provides an overall structure to the game by categorizing where activity can take place, forming a structural hierarchy that lends readability to a large and complex virtual space. Role-playing games and MMORPG's often use nodal space as their primary pattern for this reason.

Nodal space traces a direct relationship between the activities we perform in gameplay without influencing the outcome of those activities. Nodal architecture does not directly impact on gameplay except by placing boundaries to activity, so that gameplay becomes location specific. Spatialization of activity through architecture and landscape is familiar and easily understood by players even if, as Ernest Adams notes, buildings are not the most efficient way to organize activity in games [3].

Games that privilege nodal space mimic real life environments, using our familiarity with architecture and function to signify places where corresponding activities take place. Mattias Ljungström found that *World of Warcraft* uses spatial concepts that correspond with patterns expressed in Christopher Alexander's *A Pattern Language* [20], which construct the built environment to enact social solutions. Nodal games rely on not subverting popular conceptions of architectural and landscape roles. An inn must be recognizable as an inn to be useful and a fortress must look like a fortress if a quest asks you to seek one out. Increasingly games are building their own database of architectural types where dungeons and inns have game specific meanings.

Figure 3. Nodal space in *The Sims*

The Sims (Maxis 2000) uses nodal points in a different manner. Players can move into a ready-made suburban home complete with traditional areas of program such as kitchens, bathrooms and bedrooms. Alternately the player can construct their own place using a menu of items. The player can construct something quite different out of these items yet doing so, such as constructing a house with toilets in the living space, makes no difference to gameplay outcomes. When we play against the dominant suburban uniformity of *The Sims* the pleasure lies in subverting the normative values. *The Sims* then relies on the player to generate these socially acceptable patterns or use the social norm as a counterpoint. Activity is informally tied to

location within a social pattern. The player plays with the nodal pattern or against it, either way *The Sims* relies on it.

Codified Spaces

Architecture can be seen as a system of signs. Architecture is both a container and a shorthand symbol for what it contains. Geoffrey Broadbent writes all buildings "inevitably carry meaning" [6]. Architecture denotes its function and connotes other more insubstantial meanings. Videogames take this symbolic capacity and develop it as a essential part of gameplay. A barracks building in *Lord of the Rings: Battle for Middle Earth* (EA Games 2006) is not a place to house soldiers but an object that creates soldiers and a marketplace does not trade goods but creates the economic effects that are associated with trade. The buildings look like architecture but are not habitable constructs. Architecture operates as a sign of its ability to provide items or effects that are associated with it in reality.
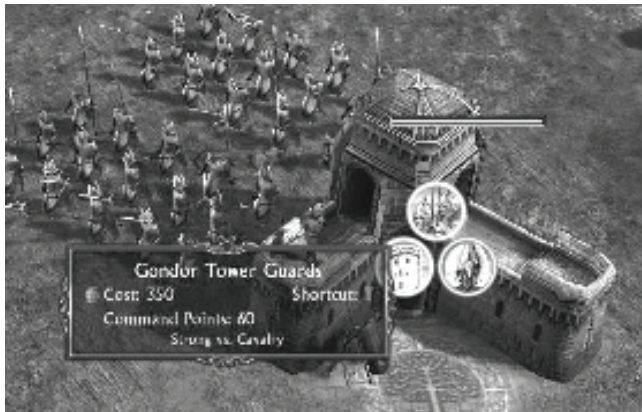

Figure 4: Building as Menu in *BFME II*

Landscape also functions as codified space, particularly when it is seen as a set of resources as opposed to an experiential space. In *Sid Meier's Civilization IV* (Firaxis Games 2005) each type of landscape has specific effects; grassland gives a bonus to food production while jungle terrain decreases food production and movement. Other tiles can be mined or quarried. The landscape is projected as a patchwork of economic and industrial possibility.

Codified space explicitly represents something other than itself. This might be information or access to objects and effects. As spatial constructs it is inevitable that videogames should use spatial symbols as a major part of gameplay. Codified Space is about the connection to information that is in itself not spatial, where data is placed within a spatial allegory. Architecture acts as a simplifier that reduces complex information layers to a comprehensible and localized icon. Strategy games, which require management of large amounts of complex information, are the biggest employers of codified spaces.

Codified spaces are a conduit for gameplay. In themselves they have no direct affect on gameplay except through the associated effects that are accessed through them. Codified spaces contain information and objects used in gameplay.

Codified space then links to Henry Jenkins' concept of embedded narrative, where "the game world becomes a kind of information space" [16] and narrative elements are read through spatial detail.

Games that codify space formalize the association between architecture and what architecture can represent. Galloway notes that RTS and resource management games like *Civilization III* (Firaxis Games 2001) and *SimCity 3000* (Maxis 1999), in which the player can conduct much of the game through interfaces and menus, are connected to the diegetic game world but exist at a remove from it [13]. In *Battle for Middle Earth II* the act of spawning an army occurs only through accessing menus from the buildings, which then stand as symbolic containers that represent the linked capabilities. Architectural properties are transformed into informational matrices and the architectural object becomes a place where the information layer connects to the game world. In essence game space itself becomes an interface.

Creation Space

Architecture is something built and then continually altered, remodeled and reused by its inhabitants. A game space is also something that can be constructed as a part of gameplay. *Sim-City 3000* requires the player to create and manage a city, through zoning land, placing services and building transport networks. The player changes the game environment indelibly, changes that are reflected in how the city grows. The city operates as the sum of its architectural and urban fabric.

Figure 5. Making walls in *BFME II*

Creation space occurs in *The Sims* when we build a house, in *Battle for Middle Earth 2* when we construct a defensive base and in *Trackmania* (Nadeo 2004) when a player creates and edits a racetrack. But creation space can also be destructive. This might be combative as in *Battle for Middle Earth 2* when live opponents attempt to undo your base building efforts. Or it might be part of an environmental puzzle as in *Katamari Damacy* (Namco 2004) where an adhesive ball is rolled around the game world until it is large enough to replace the stars accidentally destroyed by the King of the Cosmos. Each item added changes the totality of the ball, as it grows it can grab larger and larger

items. Parts of game space itself, buildings and mountains, become detachable objects that can be consumed by the ball.

The ability to damage an environment does not indicate creation space, unless that damage has an impact on gameplay. In the same way that a player may leave behind a level filled with bloodstains and bodies, destructible levels can be filled with the carcasses of buildings, the architectural equivalent to gore. If a war game allows you to blow up buildings but that demolition does not allow you to access different areas, impede enemies or otherwise affect outcomes then environmental destruction functions only as eye candy. Destroying buildings in *Company of Heroes* (Relic Entertainment 2006) does more than provide vicarious pleasure; it denies cover for the enemy, changing the battlefield and the battle. In creation space architecture and landscape function not only as the game environment but become intrinsically part of the player's toolbox. Space is not just a place to play in but also a thing to play with. Creation space becomes gameplay.

Backdrops
Toca Race Driver 3 (Codemasters 2006) contains both a spatially challenging environment of racetrack and plethora of inaccessible buildings that recede into the distance. These buildings are visually detailed but cannot be entered, circumnavigated or interacted with. The buildings on the edge of the game world stand for a greater environment, shorthand for the *rest of the world.* Race Driver world is a screen world that remains forever inaccessible beyond the focus of the race. Trackside exists only as a backdrop to the gameplay arena of pit and road, where architecture does not affect or form gameplay.

Figure 6. Inaccessible Buildings
in *Toca Race Driver 3*

This racing game is essentially spatially orientated, a challenge space that uses inert objects to further its illusion of space. A racing game is a tightly focused experience that benefits from concentrating its efforts on the action space. Games that focus on a narrow band of skill as gameplay, such as driving or flying simulations, are the most common

users of backdrops. Diminishing returns in depicting areas of game space that players will not access means that many games will use backdrops at some point.

It can be argued that any navigable space is not a backdrop. To enter and traverse architecture is to have a relationship with that space. The two-dimensional architecture of "point and click" adventure games can be acted upon and often explored with the mouse. If game space is actionable it is not a backdrop. When game space is inert, un-navigable and un-interactive it reverts to a backdrop, a throwback to earlier less ergodic forms of representation. Backdrops are the default position of game space when no qualities are assigned to it. The rule driven nature of video game space demands that game space must adopt a particular spatial pattern or else be relegated to a backdrop. The ergodic nature of videogames also indicates that the backdrop will almost never be a primary pattern in a representational game's make up.

The architecture of backdrops can take any form but without being navigable or interactive, remains a spatial pastiche. In reality we are always aware of the spatiality of architecture, we know it can be navigated even if we are denied access. Real architecture can never be a backdrop in the same way as it can in videogames. But for most of us the buildings we view from the train, or spy as we drive past on the freeway, operate as backdrops.

Summary of Patterns

Challenge space	– Game space directly challenges player
	– Forms gameplay
Contested space	– Game space as arena for conflict
	– Affects gameplay
Nodal space	– Game space structured by social layout
	– Structures gameplay
Codified space	– Game space as interface & information
	– Contains information in gameplay
Creation Space	– Game space is created & altered
	– Becomes gameplay
Backdrops	– Game space as non-interactive
	– Not part of gameplay

FROM GAME SPACE TO PLAYED SPACE
Steven Johnson argues that modern culture presents high demand on our cognitive abilities, including pattern recognition [17]. Screen mediated games make spatial patterns explicit, facilitating recognition of the same patterns in the real environment. Jean Paul Gee notes that videogames present a type of situated learning, where meaning in videogames is situation specific [14]. The patterns of spatial use show that game space has situation specific meaning with gameplay. As spatial constructs videogames present us with situations of play from which we learn patterns of spatial use. Anecdotal evidence supports this: A player notes; "Yeh I look at bits of road and think what a great rFactor track they would make, or when I enter a building I work out a strategy for how I

would "take" the building" [23]. Game space affects how we see real space.

There is another way in which spatial patterns are reintroduced to reality. The same patterns of spatial use in screen-mediated games are present in pervasive games as part of gameplay. With pervasive gaming the patterns that videogames took from reality and formalized are reintroduced to real space. Pervasive games ask us to re-imagine or reinterpret the space around us as part of gameplay. By reapplying patterns of use that are normally embedded in the landscape of everyday life pervasive games reveal and emphasize what is implicit but quiescent in our surroundings.

Game space and real space interact, where aspects of both come into play. A reciprocal relationship between the two forms of space affects gameplay outcomes. In *Triangler* a challenge pattern is overlaid onto real space, where both real world obstacles and game objectives compel player movement in the physical environment. In effect real space becomes played space, a blend of gameplay and real environment. Played space is then a real space that has been impacted and affected by gamic ways of seeing and doing.

However there are problems with taking the patterns back into real space. Transposing the more physical aspects of challenge and contested spaces onto our environment can go against existing socially proscribed patterns of behavior. In the real world of ownership interacting with or changing something is problematic. Health and safety issues are significant. Consequently many pervasive games focus on social interaction, passive contests and the more cerebral aspects of challenge space. In contrast screen-mediated games allow us to experience the patterns in a safe environment where consequences are limited.

With embedded games screen-mediated patterns are supported within an artificial real space that is directed by the demands of gameplay rather than by social convention. Like pervasive games embedded games expand the connection between the virtual and the corporeal but can avoid conflicts of spatial use. With two layers of interpretation, a virtual component and an artificial real space, embedded games can manipulate the relationship between game space and real space, maintaining or distorting our expectations of space.

Screen-mediated, pervasive and embedded videogames can teach us to think in new ways about our environment. The patterns of spatial use come from reality, are refined and disseminated through videogames, and then released back into real space as ways of understanding space. Real space and game space in intersecting become played space.

CONCLUSION

Game space is based on real space. Videogames display recurrent patterns of spatial use, taken from reality, formalized and altered by the demands of gameplay. Through screen-mediated games these situations of play are made explicit. Each pattern has a particular relationship with gameplay and through this association reveals ways in which gameplay relates to game space. Given that spatiality is a fundamental feature of videogames understanding how games use space is essential to understanding videogames. These patterns are a way of understanding how games use space.

REFERENCES

1. Aarseth, Espen. "Allegories of Space - the Question of Spatiality in Computer Games" in *Cybertext Yearbook 2000.* Markku & Koskimaa Eskelinen, Raine (eds.). University of Jyväskylä, Publications of the Research Centre for Contemporary Culture, 2001.

2. Adams, Ernest. "The Construction of Ludic Space" *Level Up.* Utrecht, The Nederlands, 2003. p1.

3. Adams, Ernest. *The Role of Architecture in Video Games,* http://www.designersnotebook.com/Columns/0 47_The_Role_of_Architecture/047_the_role_of_archite cture.html 2005. Accessed 23/4/2006.

4. Bateman, Chris. *The Challenge of Agon.* 2006, http://onlyagame.typepad.com/only_a_game/2006/03/th e_challenge_o.html. Accessed 6/2/2007

5. Bjork, Staffan, & Holopainen, Jussi. *Patterns in Game Design.* Charles River Media, Hingham, Massachusetts, 2005.

6. Broadbent, Geoffrey. "A Plain Mans Guide to the Theory of Signs in Architecture" in *Theorizing a New Agenda for Architecture.* Princeton Architectural Press, New York, 1996, p133.

7. Caillois, Roger. *Man, Play and Games*, translated from the French by Meyer Barash. Thames and Hudson, London, 1962.

8. Fernandez-Vara, Clara. "Evolution of Spatial Configurations in Video Games." *Changing Views - Worlds in Play*. Vancouver, 2005, p3.

9. Flynn, Bernadette. "Games as Inhabited Spaces." *Media International Australia Incorporating Culture and Policy* No 110. The Games Issue, 2004. p52.

10. Flynn, Bernadette. "Games as Inhabited Spaces." *Media International Australia Incorporating Culture and Policy* No 110. The Games Issue, 2004, p57.

11. Franck, K & Schneekloth L. (Eds). *Ordering Space: Types in Architecture and Design*, Van Nostrand Reinhold, New York, 1994, p9.

12. Galloway, Alexander R. *Gaming: Essays on Algorithmic Culture.* Electronic Mediations Vol. 18. University of Minnesota Press, Minneapolis, 2006, see chapter 1.

13. Galloway, Alexander R. *Gaming: Essays on Algorithmic Culture.* Electronic Mediations Vol. 18. University of Minnesota Press, Minneapolis, 2006, pp 12-19.

14. Gee, James Paul. *What Video Games Have to Teach Us About Learning and Literacy*. Palgrave Macmillan, New York, 2003, see chapter 4.

15. Jenkins, Henry. "Game Design as Narrative Architecture." in *First Person: New Media as Story, Performance, and Game.* (eds.) Wardrip-Fruin, Noah and Harrigan, Pat. MIT Press, Cambridge, Mass., 2004, pp. 118 -30.

16. Jenkins, Henry. "Game Design as Narrative Architecture." in *First Person: New Media as Story, Performance, and Game.* (eds.) Wardrip-Fruin, Noah and Harrigan, Pat. MIT Press, Cambridge, Mass., 2004, p126.

17. Johnson, Steven. *Everything Bad Is Good for You: How Today's Popular Culture Is Actually Making Us Smarter.* Riverhead Books, New York, 2005.

18. Jones, Mike. "Composing Space: Cinema and Computer Gaming - The Macro-Mise En Scene and Spatial Composition." *Imaginary Worlds Symposium*. UTS, Sydney, 2005.

19. Juul, Jesper. *Half-Real: Video Games between Real Rules and Fictional Worlds.* The MIT Press, Cambridge Mass., 2005, p1.

20. Ljungström, Mattias. "The Use of Architectural Patterns in MMORPG's." *Aesthetics of Play*. University of Bergen, Norway, 2005.

21. Magerkurth, Carsten, et al. "Pervasive Games: Bringing Computer Entertainment Back to the Real World." *ACM Computers in Entertainment* Vol. 3, No. 3, 2005, p8.

22. McGregor, Georgia Leigh. "Architecture, Space and Gameplay in World of Warcraft and Battle for Middle Earth 2." *CyberGames and Interactive Entertainment*, Fremantle WA, 2006, p1.

23. The Fiddler. The Older Gamers Forum. http://www.theoldergamers.com/forum/showthread.php ?t=94607, 30 January 2007.

24. Venturi, Robert and Scott Brown, Denise. *Architecture as Signs and Systems: For a Mannerist Time*. Belknap Press of Harvard University Press, Cambridge Mass., 2004, p120.

25. Wilhelmsson, Ulf. "Computer Games as Playground and Stage." *CyberGames and Interactive Entertainment,* Fremantle WA, 2006, pp. 63-66.