

Remarks on Digital Play Spaces

Most play spaces support completely different actions than we normally would think of when moving through real space, out of play. This paper therefore discusses the relationship between selected game rules and game spaces in connection to the behaviors, or possible behaviors, of the player. Space will be seen as a modifier or catalyst of player behavior. Six categories of game space are covered: *Joy of movement*, *exploration*, *tactical*, *social*, *performative*, and *creative* spaces. Joy of movement is examined in detail, with a briefer explanation of the other categories.

When analyzing game space, there are a number of approaches that can be applied (Taylor 2005, Fernández-Vara et. al. 2005, Stockburger 2006, Borries, et. al. 2007). The approach of this paper is similar to the pattern system proposed by McGregor (2007). The focus will be on player behavior, and furthermore it will introduce a method of abstraction which enables comparing complex game spaces. Ernest Adams (2003) shows how architectural theories could be interesting to game design in general. However, as Espen Aarseth (2001) has argued, game space is only an allegory of “real” space. Therefore, architectural theories can only help us understand game space when it serves the same purpose as “real” space. This would be the case in, for example, social spaces. Yet most game locations support completely different actions than we normally would think of when moving through real space, out of play.

Consider a typical *first person shooter*-game. A novice, exploring player might see a house, windows, a tree, and a small fence in a characteristic part of a level. The experienced, achievement oriented player regards this same game space as cover, sniping positions, a temporary hiding spot, and a jumpable obstacle. This illustrates how

the same space can serve different purposes depending on the intentions of the player. It also gives us a hint of how to approach game space from a game design point of view. That is by considering the properties that are valuable to the player while playing the game. How does space support and modify certain actions, activities, and behaviors in games?

This paper presents a way of thinking about game spaces that originates from a player-centered game design point of view. It will discuss the relationship between selected game spaces and game rules in connection to the behaviors, or possible behaviors, of the player. This model of games is based on the concept of “games in virtual environments” (Aarseth 2003). Furthermore, the player is not the *player character*. A much more nuanced model, such as the one presented by Linderoth (2005) must be used to understand the relationship between the player and the player character in game spaces. The player character is a function of identity, tools, and props to the player.

Game Space

As technology has gotten better we have moved from text adventures to 2D games onto the 3D games of today. However, I want to argue that much of the basic functionality provided by game space to the player has remained the same during this evolution. Consider the change that has taken place from PAC-MAN (1980) to WOLFENSTEIN 3D (1992). The goal of PAC-MAN is to traverse every area of the level. This is visualized by yellow dots, allowing the player to see where he has been so far. In WOLFENSTEIN 3D the goal is to traverse the level until the exit is found. So, even though slightly different, both games are based on the player's ability to traverse the level.

The main difference between the view-points in these two games is that by switching to a first person perspective we can see less of the game space at the same time. In PAC-MAN the whole level is vis-

ible all the time, while in WOLFENSTEIN 3D we can only see the part of the level in the direction of the player's view. By switching to a 3D perspective the game designer makes it more difficult for the player to navigate the maze, by essentially hiding the layout of the map from the player. However, the visibility of the level is not only connected to the player view. It is possible to create a similar scenario in a 2D view with elements such as fog of war, darkness, partial views, and a scrolling screen. The 2D game THE LEGEND OF ZELDA: A LINK TO THE PAST (1991) includes dark areas where the player uses a flash light to show a triangular area in front of the player character. The visual information available to the player in this game location is almost identical to that in WOLFENSTEIN 3D. It is hard to compare the spatial properties of these three games directly, especially on the global level presented here. A closer look at the individual elements present in each game scene is necessary for an accurate analysis.

Abstraction

Consider the following screenshot taken from a demo of the game CRYISIS (2007).



Fig. 1: CRYISIS (Screenshot)

The text hint “[Space] – Jump” is shown in the center bottom of the screen. This is displayed to the player as he reaches this vertical obstacle in the beginning of the first level in the game. Why did the game designers feel it necessary to include this jump tutorial as one of the first interactive experiences available in something classified as a “shooter”? I would argue that it is because jumping is an essential behavior to this game and game genre. In order to understand this game location better, I propose that we find an equivalent 2D construction.

When transforming from 3D space into 2D, our aim is to find the intersection or representation that best describes the main player action or behavior in a simplified form without removing any key aspects. In the case above we are interested in the jump action and the movement over the obstacle. The main axis of movement is into the screen, and the secondary axis is the vertical movement over the obstacle. Any movement to the left and right does not modify the player experience significantly. – This leads us to the spatial figure in Fig. 2, which is essentially a view from the side. Since it is not possible to pass the obstacle to the left or right in this case, Fig. 2 includes all the major player behaviors of Fig. 1.

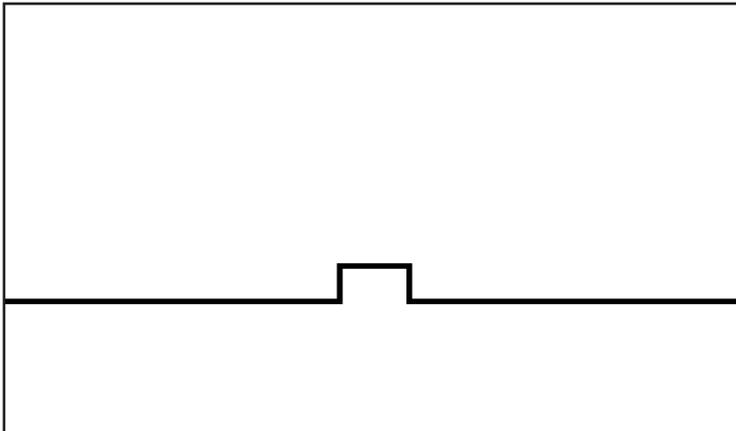


Fig. 2: The Short Platform

A player character approaching *The Short Platform* from the left can achieve two types of outcomes when trying to pass: 1. The player will jump too late (too close) to the obstacle and hit the vertical wall on the left side and fall back to the left and will need to go back and retry. 2. The player will land on top of the platform, remain for a short moment, and then continue down on the other side. The player tries to move his character from the left to the right. However, the obstacle introduces a vertical conflict in relation to the gravity available in this setting. In fact, gravity is the most important game rule in regards to jumping in this location. Without gravity the spatial structure will lose its orientation. Passing it will be reduced to an action of simply steering past it. I will therefore argue that gravity introduces orientation in game space. In particular we note that all directions are no longer equal in a space with gravity. Compare this to the game space of PAC-MAN where all directions have equal properties. Failure to jump has very low consequences in this case. The spatial construction introduces very little risk to the player. The player might lose time, but there is no risk of complete failure, such as the death of the player character.

Let us take an even closer look at the dramaturgy of movement over this construction. Consider the three edges constructing the short platform. We have 1. the left side, 2. the top edge, and 3. the right side. These three elements work together to create the following properties: 1. Creates tension and stress, it requires an active action from the player to be overcome. 2. Is the success state; being here is the reward for successfully completing a jump. It is a temporary elevated position. 3. Signals the return to status quo, and normality. – To summarize, we could put all the data regarding *The Short Platform* into a table like this:

Title	The Short Platform
Category	Movement
Sub-Categories	Vertical space
	Short-term positional change
Game Rule	Gravity
Player Action	Jumping
Risk	Low
Dramaturgy	Tension – Success – Relief
Layout	See Fig. 2

On Changing View

While a change of view from 3D to 2D does change the experience of the player; it does not change the fundamental function of a spatial construction in the game. There are many games where the player himself can turn the position of the camera view, or even choose between a 3rd person setup and a zoomed-in first person view. In this way, the player can view an obstacle from the side or behind. Even so, this does not change the obstacle at hand. The player still has to jump at the correct time to be able to pass and while the view might modify the difficulty, the fundamental challenge to the player remains the same.

In most third person view games such as *WORLD OF WARCRAFT* (2004), the player constantly needs to adjust the camera angle to get a good view of the game space. Adjusting and finding a good camera angle is an essential part of the player's skills in the game. *SUPER PAPER MARIO* (2007) has taken this concept a step further. The player plays in a side-scrolling, 2D-view; but can for a limited period of time switch to a full 3D-mode to solve spatial puzzles not possible in 2D. It is important to note that the 3D view is not always more powerful than 2D. Several passages are only possible by continuously switching perspectives.

More Examples

Now consider the construction *The Fence*. Similar constructions can be found in many game locations in FPS-games, platform games, or third person view games such as WORLD OF WARCRAFT.

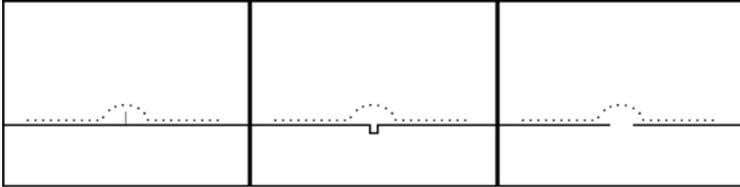


Fig. 3: *The Fence*, *The Small Hole*, and *The Gap*

The shape is similar to that of Fig. 2, but compressed horizontally, effectively removing the upper part. It enforces a *transient movement*, with no possibility to stop and rest at the success-state. The player character is either on the left or right of the fence when not moving. Tension and relief is compressed to one point. The ideal route over the obstacle is shown as a dotted line.

Let us now consider the middle construction in Fig. 3, *The Small Hole*. The route followed by a successful player is exactly the same as in *The Fence*. However, the failure scenario is different; the player will fall down into the pit and needs to jump up to get out. What is interesting about these two constructions is that the game designer has the option to choose between two structures that will provide similar movement patterns, but that are different in other aspects. Furthermore, analyzing the space in this manner makes it possible to compare them in ways that might not be immediately obvious from a purely aesthetic approach.

Now regard *The Gap*. Again, a successful passage will result in the same movement as in both previous scenarios. However, in this case there is a much higher risk involved in failure, creating a larger

tension and stress-factor for the player. It is not possible to recover from failure here, a retry from an earlier position or re-play is the only option. – The examples in Fig. 3 are all different from *The Short Platform* in the relationship to how long the player remains at a different vertical position. The former all present a transient state, while in Fig. 2 it is possible to remain at the elevated state, creating a *short-term positional change*.

The Bigger Picture

I have discussed four examples in relation to movement of a single player character, specifically in a space with vertical gravity. Only the effects on movement have been analyzed and no other factors have been considered. *The Fence* and the *The Small Hole* would probably both serve as excellent cover or hiding locations from a tactical point of view, while *The Gap* does not provide any such properties. This leads to the question: What functions do game spaces provide to the player, given certain game rules? I have chosen to work with the following categories that will be briefly presented in this paper: *Movement*, *Exploration*, *Tactical*, *Social*, *Performative* and *Creative*-spaces. These categories coincide and slightly overlap the pattern categories proposed by McGregor (2007). They are furthermore inspired by the player behaviors described by Bartle (1996) as well as Caillois (2001). Before discussing examples from the other categories, let us explore the term *Joy of movement*.

Joy of Movement

When we use the term *movement* in relationship to game spaces, a more narrow definition might be necessary. To further emphasize the play-factor involved I have chosen to use the term *joy of movement*. It is borrowed from a similar term in interaction design, *joy of use* (Hatscher 2000), with influences from the theory of flow by Csikszent-

mihalyi (1990); in particular the part described as *the body in flow*. This in turn is naturally related to the activity *Parkour*, invented by the French performer David Belle. Joy of movement is the action of moving through a space for the thrill of movement in itself.

Joy of movement is constructed from singular elements such as those presented here already. These elements are then combined to create rhythm, dramaturgy, and melody in the game space presented to the player. A perfect example is found in SUPER MARIO WORLD (1990). The linear level layout in this game functions as a spatial narrative; there are sidetracks available but with little freedom, and most players will take the same path through the game world. The category “joy of movement” can be divided into several sub-categories or partitions, one being that of *oriented space* and *non-oriented space*. For instance, vertical spaces with gravity belong to oriented space. Further partitions include *local* and *global* constructions, where local elements are used as components in global spaces.

Under local vertically oriented space there are further sub-categories available. Two have already been brought up: transient and short-term positional change. Another is *permanent positional change*. We can see three examples of this in Fig. 4. All three of these structures will result in similar movement of the player character; they do however differ in aspects such as risk and player interaction. *The Smooth Slope* completely makes away with the challenge of a timed jump, and smoothly re-adjusts the player’s vertical position while he moves from the left to the right. On the other hand, the *Unsafe Stairs* creates a big tension with its possibly dangerous gap.



Fig. 4: *Step, Unsafe Stairs, and The Smooth Slope*

I will use the term *reduced horizontal space* to describe a non-oriented space where the player character movement takes place mainly in one dimension without the influence of elements such as gravity. Typical game locations include racing games such as *POLE POSITION II* (1988) with a view from behind the car and *LE MANS* (1982) with a view from above the track. The challenge to the player presented here is the ability to react to changes in directions of the passable area. Abstract representations of these spaces can be found in Fig. 5. The first example shows how a complete change of direction is constructed, whereas the second show a permanent shift in the horizontal position. A more open horizontal space is found in *The Round Corner* which will allow the player to follow the wall without effort (given that the wall is smooth).

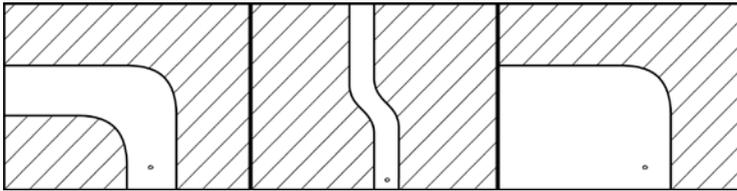


Fig. 5: *Directional Change, Permanent Horizontal Position Shift, and The Round Corner*

A game space such as *PAC-MAN* contains structures of reduced horizontal space. On the global level the player is free to move in each direction with equal properties. However, the narrow pathways reduce the player's choice of movement significantly. As the player character races through the level, the freedom to choose paths adds a tactical and navigational challenge. Yet, in regards to joy of movement on the local level, *PAC-MAN* is closely related to racing games. Furthermore, on a global level the maze in *PAC-MAN* serves to condense the play area while maintaining a long path to traverse.

Free horizontal movement can be found in games such as WORLD OF WARCRAFT. It generally has a free horizontal space, combined with oriented vertical space to create interesting obstacles. There are however here, too, many areas with more maze-like-structures or tunnel-shaped spaces. Especially the dungeons are often linear and based on reduced horizontal space. Totally free movement does exist in 3D game spaces; DESCENT (1995) is a game with 6 degrees of freedom. The game allows the player to navigate a space ship in a gravity-free space without orientation. However, since the game levels consist mostly of tunnels, large parts are transformed into something akin to a reduced horizontal space where the player can choose which way is up.

Global space is the combination of local elements into larger complex constructions. Three common examples are shown in Fig. 6. *Equal Spacing* creates a backbeat to the play rhythm, whereas *Escalation* is a natural element of any dramaturgy, and finally the third construction is a simple example of spatial *Melody*.

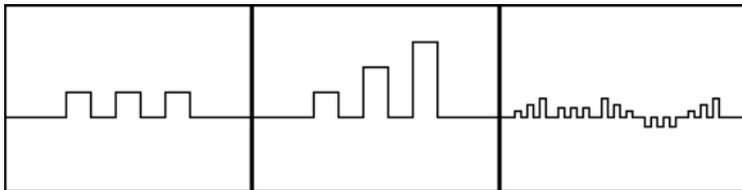


Fig. 6: *Equal Spacing*, *Escalation*, and *Melody*

Exploration

The Princeton online dictionary WordNet defines exploration as “to travel for the purpose of discovery”. The purpose of this activity is clearly different from the one described previously under *joy of movement*. Whereas *joy of movement* focuses on the movement per se, exploration is about moving through game space in order to learn about it.

While exploring, the player will be influenced by several aspects of the game space. In particular the elements of the game world that help the player navigate. Frequent examples would include *road signs*, and other spatial hints of location and direction such as the architectural pattern *intermediate destinations* by Christopher Alexander (1977:586). In direct contrast are elements placed in the game space to create confusion. This includes constructions such as mazes, labyrinths, and incorrect information; among others. It is also in this sense that game spaces differ from “real” spaces; the game designer is not primarily working to make the game space as easy as possible to navigate in all areas. Instead, the focus is on creating an exciting space with a balance between confusion and ease of orientation.

A large part in the activity of exploration, as it is currently played out in digital games, is structured around hidden elements: Game objects or spatial constructions deliberately hidden, with the intent that the player should search for them actively or stumble upon them as a result of thorough exploration. Examples here include secret doors, hidden chests, key-lock problems, but also spatial *Easter Eggs* such as those found in ADVENTURE (1980) or DOOM II (1994); where a hidden room shows the game creator’s name or image (Gouskos 2008).

Tactical Spaces

Tactical spaces affect the player’s ability to perform a tactical action. Typical actions in an FPS-game would be to take cover, to hide, to snipe, or to ambush. Tactical spatial constructions are perhaps more than other categories bound to particular game properties. One such feature is the almost universal property of *Line of Sight*; an unobstructed straight line between two points in game space. Figure 7 shows three basic examples relating to line of sight and cover positions. The line of sight is represented by an approaching dangerous object. The first two protect the player character against a horizontal danger, whereas the last shows an example of a vertical cover.

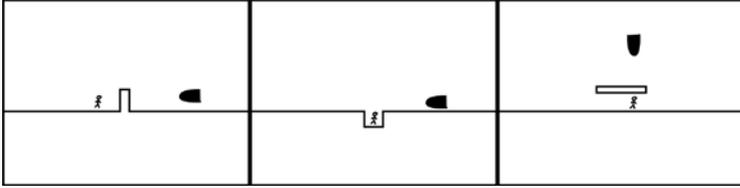


Fig. 7: *The Wall, The Hole, and The Roof*

As well as influencing the direct tactical choices of the player, tactical spaces additionally highlight the relationship between the location of the player character and the location of other game objects. Any spatial structure that affects the strategic power of the player tokens in regards to the game AI or other players is a tactical construction.

The Vertical Corner demonstrates this principle by showing the asymmetrical relationship between the player on top and the players below. The former can choose to expose himself or retract to a non-visible position, whereas the lower player characters are more constrained.

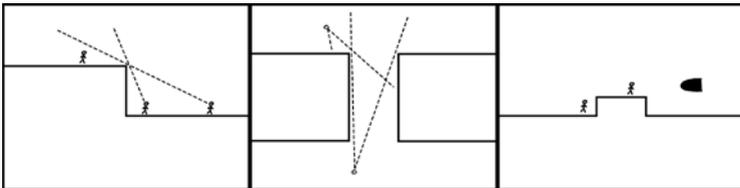


Fig. 8: *Vertical Corner, Simple Entrance, and Exposed Position*

The Simple Entrance is a typical example of a transition area and choke point. The player choosing to enter the narrow area in the center will be very vulnerable. In a similar fashion, the third example shows how the elevated position of a platform creates an *Exposed Position*. A game designer will often combine these exposed positions with some other strategic element that is crucial to the player,

such as a powerful spawned object or other game objectives, to create tension and motivation to move to and through such areas.

Furthermore, line of sight is important in regards to the ability of the player to retrieve information about the game world. Information is mostly gained through visibility; the player knows what he sees. Any spatial construction that modifies the view of the player also modifies the information available.

Social Spaces

Social spaces are important to humans, in games and elsewhere. This is an area where it seems that theories from “real world” architecture can be directly applied to digital game spaces, in particular for online games with a first person or close 3rd person viewpoint. The purpose of a social space is to enhance the possibility of social interactions between players. Verbal as well as non-verbal social interactions are important to the players of online digital games. Communication and travel time could be instant in online games. However, travel constraints are often implemented to make the game world relevant. On the other hand, most online games have one space in common that allows instant and global communication; the chat window. This is a location where the player is identified merely with a text-label, his game name.

Still, players move around in the world and encounter new previously unknown players. A social space is a location that attracts players and facilitates socializing. It might be a place where the player feels at rest, or it might be a busy trading location. *The Promenade* is a typical example from Alexander (1977:168). It is based on the premise that “each subculture needs a center for its public life: a place where you can go to see people, and to be seen.”

Performative Spaces

Performative spaces allow the player the means to perform or role-play. Caillois has named this essential part of play mimicry. The player “makes believe or makes others believe that he is someone other than himself. He forgets, disguises, or temporarily sheds his personality in order to feign another” (Caillois 2001:19).

While roleplaying, the player uses game objects to create a personal fictional story. Of particular importance are objects that can serve as props in this narrative. This includes clothes, skins, and basically any texture or object that can be attached to the player character. Furthermore, the player character itself is a prop to the player. The performance of the player when directed towards others can be supported by being on a stage, or stage-like structure, such as a tavern or an elevated position. Finally, the player often has access to a number of animations that can be performed by his player character, called *emotes*. Typical emotes include greetings, hand waving, shaking the head, and dancing. – All these three items (props, stages, emotes) are for sale in the online world of *SECOND LIFE* (2003). By acquiring the artifacts needed, the player can customize his character, his performance, and his online identity in every detail.

Creative Spaces

A creative space allows the player the chance to create and innovate within the boundaries of the game world. This can be permanently, on a global level, or merely a local short time effect. What are the spatial elements that allow creativity in digital game spaces?

Let's look at the game *LINE RIDER* (2006). The main creative ability available to the player is the possibility to add a line at any arbitrary location in the game world. In this particular case the game world starts out empty, giving the player total control over the layout. However, the player is still limited to only using the element of the

black line. Nothing else is possible, setting up a creative limitation that the player has to work within. Looking at the community around *LINE RIDER* (Marcandremob 2007), one can see the amount of work and planning that must have gone into many levels.

Now regard the game *SIMCITY* (1990). Here we find similar properties but with an increased complexity. The player can choose from a multitude of building tools ranging from different kinds of buildings, to roads, airports, electricity lines, and railroads. Many of the choices involved in playing this game are strategic instead of creative. However, players still have some creative freedom after they have made their strategic decision, and could play the game as an entirely creative exercise (although probably with limited success). Exactly as in real life, it is possible to create a functional city that is either aesthetically pleasing or not, and it is up to the player to decide what to create. – As we can see, there is a common factor here in that the player is given certain tools or powers to modify the game world and is then asked to be creative within certain limits.

Conclusion

I have presented a number of functions of game space in regards to player behavior. Game properties, such as gravity, have been matched with spatial layouts and specific player behaviors in order to better understand how these three aspects work together. Furthermore, I have shown how to reduce a complex 3D game into simpler abstract 2D components for easier analysis and comparison. It is my intention that the way of thinking outlined in this paper could serve both as a tool for further analysis of game space elements, and assist in the creation of new game spaces.

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