

A Bachelor Thesis

Spacial Management in Fighting Games - How can Space Management enhance Combat Design?

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1. Abridgement

2. Introduction

Combat serves as the ultimate gateway to immersion in a myriad of games, acting as the pivotal moment where players assume control and engage with the game in the most action-packed and thrilling manner. It is a crucial aspect that most games cannot afford to overlook, as it possesses the ability to captivate and retain players' interest over an extended period.

The game's space or the environment in which players can interact, holds immense significance in facilitating immersion. The very act of engaging with the game world is paramount to completely immersing oneself in the virtual experience. The layout and design of these spaces play a critical role in establishing the game's balance and strategic elements. Certain games leverage their level design and spaces to foster compelling tactics. This is particularly evident in fighting games, where the utilization of these elements can give rise to mind games and intriguing player behaviors. Given the competitive nature of such games, pitting human opponents against each other, the level design becomes a crucial factor in shaping the overall experience. In fighting games, the carefully crafted spaces are often designed to encourage strategic thinking and tactical decision-making. The placement of obstacles, platforms, and other environmental features can have a profound impact on the flow of combat. Players must adapt their approach and employ different strategies to gain an advantage over their adversaries. This dynamic interaction between the game space and combat mechanics creates an engaging and intellectually stimulating experience, as players constantly analyze and adapt to the evolving circumstances. Moreover, the level design in fighting games also influences the psychological aspect of gameplay. Players must not only anticipate their opponents' moves but also account for the possibilities offered by the surrounding environment. The strategic use of spaces can introduce an additional layer of complexity, where players must not only outmaneuver their opponents but also exploit the advantages offered by their surroundings. This adds depth and excitement to the gameplay, as players are encouraged to think critically and creatively in their pursuit of victory.

The primary objective of this paper is to address the connection of combat design and spatial thinking with a focus on the fighting game genre. Combat design holds significant importance in a wide range of games, particularly in the realm of fighting games. The effectiveness of combat within a game influences its overall rhythm, intricacy, and the variety

of gameplay experiences it offers. This paper primarily concentrates on the genre of fighting games, specifically delving into renowned titles such as Super Smash Bros, Street Fighter II, and Pokken DX. This paper emphasizes spatial management, because in contemporary fighting games, the ability to control space is an indispensable component for achieving success. Being aware of areas where you are safe from your opponent, recognizing advantageous or disadvantageous positions, and understanding the most favorable options available at each specific location enhances one's chances of securing victory. These elements contribute to engaging interactions, strategic mind games, and motivate players to diversify their movement patterns. Constructing environments that facilitate such behavior is an integral aspect of spatial management and level design. To understand how such behavior can be gained I also need to understand how players use spaces, by analyzing gameplay and behavior of players with different skills.

This paper undertakes a thorough analysis of combat design and spatial thinking, with the objective of investigating the synergistic advantages that can emerge from their interdependence. Subsequently, the acquired knowledge will be harnessed to conceptualize and execute a game project. The central focus of this project endeavor centers on the development of a foundational fighting game that actively integrates the insights elucidated within this paper. Significantly, the game will prioritize the incorporation of captivating movement options and spatial mechanics to heighten the overall gameplay experience. By emphasizing these aspects, the game will be uniquely positioned to engage players and immerse them in a dynamic and stimulating environment. To ensure broad accessibility and visibility, the game will be made available on itch.io, a popular gaming platform. Additionally, efforts will be made to present the game at various events within the Berlin game scene.

Combat design plays a crucial role in modern gaming, particularly in games that feature real-time gameplay. In fact, combat often serves as the primary source of action and excitement within these games. Without engaging and dynamic combat mechanics, the gameplay can quickly become repetitive and uninteresting. In an industry that is constantly expanding, it becomes increasingly challenging for developers to create combat systems that truly stand out from the crowd.

Personally, I have always been captivated by games that offer fast-paced and action-packed combat experiences. As I delved deeper into my own fascination with these games, I

realized that my love for combat stems from the fact that it allows me to interact with the game world in the most visceral and thrilling way possible. Unlike other aspects of gameplay, combat provides a direct means for players to exert their influence and make an impact on the virtual environment. One aspect of combat that particularly intrigues me is the ability to utilize movement and positioning as advantages. The inclusion of interesting movement options and the seamless integration of the game world into combat mechanics contribute to a sense of coherence and immersion. When players can interact with the environment and leverage their surroundings to gain an upper hand in combat, it adds a layer of depth and strategic thinking to the experience.

Among the various genres that feature combat, I have chosen to focus on fighting games due to their complexity and the psychological elements they bring to the gameplay. These games offer a unique blend of mechanics that require precise timing, strategic decision-making, and adaptability. The interactions between players in fighting games are intricately woven, often involving intricate combos, counters, and mind games. Fighting games also emphasize the significance of the game environment and spaces in its impact on combat. Take, for example, "Super Smash Bros," where each character possesses different hitboxes, hurtboxes, and advantage states. Additionally, the concept of edge-guarding, which involves preventing opponents from returning to the stage, introduces additional layers of tactical play. By exploring the possibilities within these environments and utilizing the mechanics available, players can create intriguing and memorable interactions. I always was captivated by unique fights in film and complex combat like in fighting games offer a diverse amount of actions and movement that combined with the player versus player component immerses me as I would be in such movies. I want to analyze how space can be used to enhance this experience the most.

3. Human Mind

3.1. General

When we talk about space and design then we have to talk about the human mind. We use our mind all the time to deal with the space around us. That is a big topic to unpack, but I will specify information that may become useful later in this paper. Later I will use this segment to analyze how the human mind thinks while using spaces in fighting games and how this can help designing space. To show the importance of this I will quote Don Norman:

“Why do we need to learn about the human mind? Because things are designed to be used by people, and without a deep understanding of people, the designs are apt to be faulty, difficult to use, difficult to understand.” (M1 - p.44 l.12 - 15)

Don Norman wrote about the human mind and design in general in “The Design of Everyday Things”. How does the human mind work when using a design? He talks about something he calls the gulf of execution and the gulf of evaluation (M1 - p.38 l.21-25). The first one is the gulf of execution where you have a goal of using something and look at what you can do and how you can do it. Then you do it and face the gulf of evaluation. You can evaluate the results of this action and if the goal is achieved. A well designed product bridges these gulfs in an easy foolproof way (M1 - p.39 l. 25-35). To specify on how the mind works out an action Norman writes about the “seven stages of action”. First you form a goal, then you plan on doing an action, then you specify what this action should look like and you perform the action. These first four steps are the gulf of execution. After that you perceive what happened, interpret it and compare it if the goal is fulfilled. This is how using a design looks, but what does your mind do while doing an action in this construct and how does it function in practice? Norman writes that a goal and acting out the seven stages can contain smaller goals within with multiple actions and that they are often subconscious. We don't always think about forming goals and do the actions before doing them. Evaluating these more complex patterns is called by Don Norman “root cause analysis”(M1 - p.42).

Now that we talked about how actions and goals can be analysed Norman continues writing about emotion and thinking. Both have major influence on each other. For example an alarming situation can trigger tense emotions and our thinking becomes faster and more instinctive (M1 - p.48 l.21 - p.49 l.14) or thinking that something alarming could happen triggers tense emotions (M1 - p.54 l.13 - p.55 l.16). Thinking happens on three different levels, writes Don Norman. The visceral, behavioral and reflective level. The visceral level is our biological, instinctive brain (M1 - p.50 l.4 - p.51 l.22). Norman also calls it the lizard brain. It has to be quick, judging and evaluating safety. It is basically the fight or flight level of our thinking. In video games this level is used for example when you are in a new, tense situation. When you are new to a fighting game and yet don't know what to do people tend to mash on the buttons. Next is the behavioral level (M1 - p.51 l.23 - p.53 l.2). This one is based on learned behavior. An example of this is speaking, but video games and especially fighting games also rely on learning. In both you build up patterns that you can, if learned, call up at any time. The last one is the reflective level (M1 - p.53 l.3-20). This level is the most conscious. It's about reasoning and evaluation, but it is because of that rather slow. In fighting games this is when after the match you evaluate what you can do better or what was effective in which situation. As I have shown in my fighting game examples and as Don Norman writes, a design must work on all of these levels (M1 - p.53 l.20 p.54 l.23). Now Norman combines the seven stages of action and the three levels of thinking. (M2) Planning and comparing are on the top at the reflective level, because they require some conscious cognition Then specifying and interpreting at the behavioral level, because both use learned behaviour. At the bottom is performing and perceiving at the visceral level. (M1 - p.55 l.17 - 38)

One other phenomenon Norman writes about is the so-called "flow" (M1 - p.55 l.38 - p.56 l.31). You are in the flow when you do a task which isn't too hard or easy and you lose yourself in it. This is also a situation you want to achieve in every fighting game. Then it is the most fun. When you mastered using your tools and the space to your advantage

3.2. Spatial Thinking

- Space is key to survival
- We use space for shelter
- “The term “spatial thinking” is used as a unifying, common umbrella term for the human ability to direct optical stimuli received by the eye into the brain, to be able to interpret these stimuli, to be able to recognize spatial objects, to be able to mentally imagine spatial objects (with or without prior optical stimuli), to be able to manipulate these objects mentally, to be able to imagine taking other perspectives in space, to be able to perceive and interpret motion sequences, and to be able to execute spatial motor movements”
- How important is Spatial Thinking in our everyday lives?
- Spatial Thinking on the example of games
- How does spatial thinking work on a cognitive level, and which psychological processes are involved?

4. Design of Fighting Games

4.1. General

- Design Principles
- Level Design
- Combat Design

4.2. Analysis of Combat Systems regarding Spaces

- Book of Lenses Analysis of Super Smash Bros and Street Fighter 6
 - Jumps as a mechanic
 - Spacing
 - Positioning
 - Hitboxes
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4.3. Analysis of Player Behavior regarding Spaces

- Analysis of Gameplay footage of SSB and SF6

- Where do players want to go?
- How do they get there?
- How do they react?

5. Findings

- Space is key to human survival and is key part of human thinking
- Space in fighting games is key to strategic play (Positioning; Spacing)
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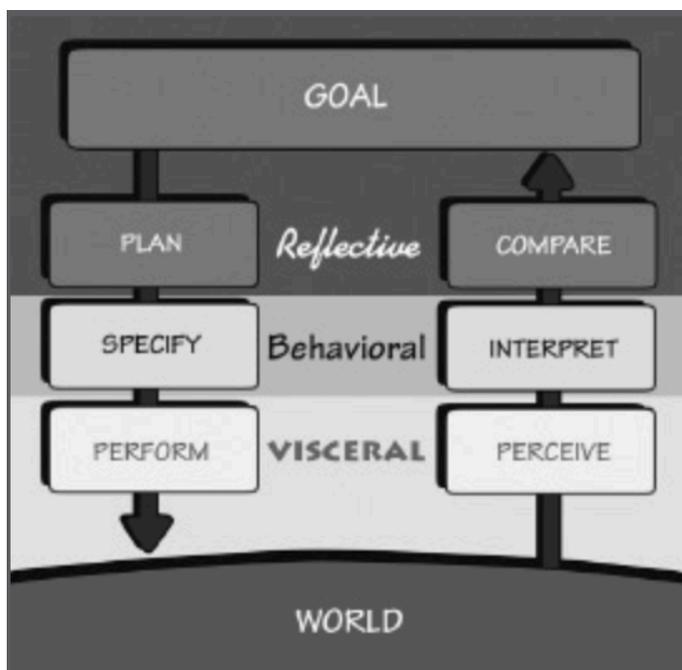
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