

INSIDE THE MIND OF THE MACHINE: AN EXPLORATORY STUDY OF *STREET FIGHTER IV* PLAYERS

Abstract. *In the article I explore online communities of players of the fighting game Street Fighter IV. I use non participant observation to analyse the way players relate to the game and construct their experience of it. The analysis reveals a profound immersion of Street Fighter IV players into gameplay mechanics. They analyse the minutest technical details of the game engine to gain a competitive advantage and have developed a terminology that covers both technical and strategic aspects. To progress in the game players have to hone their skills through constant practice that improves their motoric skills and reflexes, and by devising a strategy and learning to anticipate the moves of the opponents.*

Keywords: *video games; Street Fighter IV; online gaming communities*

Introduction

Since video games are a relatively new field of study, the ontological, epistemological, and methodological foundations of studying them are still in a state of flux. Another factor adding to the heterogeneity is the fact that at least in the early stages of video game research, there existed a strong tendency to transfer theoretical and methodological approaches from other fields of study to the study of video games. One such example is the large body of research which views the content of video games as stimuli that may cause behavioural changes in players, most often focusing on aggression (Breuer et al., 2013; Chiattaro and Sioni, 2012; Greitmeyer, 2014; Willoughby et al., 2012) but also on positive outcomes (Granic et al., 2013; Oei and Patterson, 2013). This approach has been criticized for being too narrow, reducing video games to a stimulus and ignoring the complexity of video games and players' varied motivations, experiences, and ways of interacting with video games.

* Aleksander Sašo Slaček Brlek, PhD, Teaching Assistant, Faculty of Social Sciences, University of Ljubljana.

Other researchers, drawing mainly on literature studies, have been focusing on the narrative aspect of video games, its structure and wider social and ideological dimensions (Gallagher, 2012; Poor, 2012; Shaw, 2009; Ip, 2011). Another approach, the so-called “ludological” approach, has been applying games theory to the study of video games, focusing not so much on the narrative aspect as on the act of playing. In this vein, some authors even suggest that video games, especially when played competitively, can be seen as a form of sport (e.g. Eskelinen and Tronstad, 2003; Witkowski, 2012). While these two approaches are sometimes presented as incompatible, some authors are critical of this position and claim that it is more productive to take them as complementary. As Crawford and Gosling (2009: 58) claim: “Hence, just as the reader of a book assimilates the information on the page into a coherent story, it can be argued, that players of sports and video games, similarly construct narratives of play.”

Many scholars attempt to bridge the divide between the narrative and ludological approaches. For example, Ang (2006) proposes a model composed of a narrative and abstract (game rules) layer which are in a relationship of mutual dependency, and concludes that »we should focus on developing a theory that unifies both categories.” (Ang, 2006: 323). The model of “procedural rhetoric” (Bogost, 2007) has proven fruitful in this respect. Harper (2011) has applied this model to the case of *Persona 3*, focusing on how the interplay of “fusion of ludic qualities and thematic/narrative elements” (Harper, 2011: 408) suggests certain ideological frames.

Further study is needed to elucidate on the interplay between ludic and narrative aspects, since there is significant variation between games and also between players regarding the nature and importance of narrative, its (non-)linearity and structure, etc. While some games are highly structured and attempt to tell a story in the way the producers imagined it (such as the games from the *Bioshock* series), others allow the player much more freedom to shape the course of events and construct their own narrative (like *World of Warcraft* or *Minecraft*). The way players interact with the game also varies significantly. Some might focus on the narrative and the way it relates to their identity and the society around them, while others might be focusing their attention more on the technical aspect of gameplay. According to Crawford and Gosling (2009: 62): “For the more hardcore gamers we interviewed, gameplay seems to be less about relating the games to wider social narratives, such as picking their favorite football team or player, but more about the mechanisms of the game itself.” Newman comes to similar conclusions when analysing the function of player-created walkthroughs: “/W/alkthroughs encourage the consideration of the manipulability of videogames and the potential to explore games and gameworlds as material for play rather than necessarily restrictive,

rule-bound structures that push gamers down prescribed paths.” (Newman, 2005: 60)

On the one end of the spectrum we find power gamers as described by Taylor (2006), players who largely disregard narrative experience in favour of gaining statistical advantage, on the other cheaters, as described by Consalvo (2007), who often resort to cheating to be able to consume the story without having to bother with the challenges of gameplay. Oswald et al. (2013) found that when querying gamers about the meaning of video games to them, their responses could be grouped into six categories: “Emotional Responses, Game Play, Social, Outcomes of Game Play, Goals, and Personal Qualities.” (Oswald et al., 2013: 5) This goes to show that motivations of gamers are not uniform and it would be reasonable to expect that their interaction and experiences with games can also vary significantly. For example, some researchers (Amory and Molomo, 2012; Greenberg et al., 2010; Lucas and Sherry, 2004; Terlecki et al., 2011) have found that there are gender and age differences in gameplay behaviour and orientations toward gameplay.

In order to account for this heterogeneity, we should not restrict our attention narrowly to the situation where players directly interact with the game. Players relate to games and their stories and characters in myriad other ways: be it in conversation with their peers, visiting and discussing their favourite games in online forums, viewing and creating fan art, attending events like *Comic-con* and *E3*, or taking part in cosplay (dressing up as fictional characters). As Newman (2005: 48) claims:

The focus on the player experience of the single-player is perhaps inevitable, though there can be no doubt that it betrays a lack of engagement with or immersion in the cultures of gaming and the variety of ways in which games are actually used irrespective of the intentions of their designers.

Furthermore, some players go to extreme lengths to uncover not only everything the designers intended to be included in the game world, but go also beyond the game world: discovering unused code to shed light on the development process of a game and settle disputes about the “canon”, accessing areas in the game that the player should not be able to access or accessing them before the intended time, finding glitches in the game, and devising special challenges like completing the game without collecting any power-ups or doing speed runs (completing the game in as little time as possible). The question of identification is also relevant, since not all people who play games identify themselves as “gamers”. (Shaw, 2012) In short, the actual uses of video games, both in the interaction with the games

themselves as well as interactions between gamers through other channels, can be extremely varied and require further study.

Methodology

The case I have chosen is the fighting game *Street Fighter IV*¹. The reasons for choosing this game are several. It is among the most popular fighting games in terms of sales (*Street Fighter IV* has sold 3.3 million copies according to Capcom, 2013²), content created by fans (videos, fan art, online forums), and competitive play (*Street Fighter* tournaments have long been a staple of gaming events like *E3*). Furthermore, while some other types of games have received a fair amount of scholarly investigation (foremost among them MMOs like *World of Warcraft*), there is a relative lack of research on fighting games. According to Hutchinson (2007: 283) such games are “most often seen in terms of simple entertainment, lacking narrative power and encouraging an apathetic and passive attitude to violence.”

The case was studied through non participatory observation of *Street Fighter IV* online communities to discover how players themselves relate the game. The websites were identified via a snow-ball technique by using Google with the keywords *Street Fighter* in the first step and then following links posted on these sites to extend the sample.

Masters and apprentices

At first glance the gameplay of *Street Fighter IV* seems rather simplistic: characters can move left and right, jump and duck, perform three types of kicks and three types of punches, varying in speed and amount of damage, blocks, throws and special moves. Each player starts the match with a limited amount of “life”, which is reduced each time they receive a hit from the opponent. When it reaches zero, the match is over. But appearances are certainly deceiving in this case, since my analysis has revealed a staggering complexity behind these simple mechanics. Players analyse the exact duration of every possible move to determine possible combinations and

¹ For the purpose of this article, I will use *Street Fighter IV* to refer to three distinct versions of the game: *Street Fighter IV*, *Super Street Fighter IV*, and *Super Street Fighter IV Arcade Edition*. The versions are overall very similar, yet differ in the character roster (*Super Street Fighter IV* added ten new characters to the roster of *Street Fighter IV*, while *Super Street Fighter IV Arcade Edition* added another four), fighting arenas and, to a lesser degree, graphics and gameplay mechanics (here we find tweaks, rather than fundamental changes).

² This number is relatively small compared to best-sellers like *Grand Theft Auto V* and *Call of Duty: Ghosts*, which have sold tens of millions of units. According to the Entertainment Software association (2013: 8), fighting games are among the less popular genres in terms of sales, making up 3.9% of total units of video games sold in the USA in 2012.

develop strategies, they delve into the algorithm of the game to take advantage of shortcuts and ambiguities, and they develop and discuss a terminology, covering both technical and strategic aspects of the game.

Much of the material on the forums I have analysed is meant to help players learn techniques and strategies to become better at playing the game. This transmission of knowledge takes place primarily through instructional texts and videos, discussions, and analyses of gameplay videos.

Instructional texts and videos are prepared by more experienced players and cover a wide variety of gameplay aspects. They range from explanations of the basics of gameplay mechanics, discussions of the relative strengths and weaknesses of specific characters, to more advanced information about “combos” (for example, which moves should be combined to achieve a maximum amount of damage), “set-ups” (ways to create openings for high-damage attacks and combos) and technical details of the game engine (like “option selects” and “auto-corrects”, which are discussed later on). The videos in this category follow a similar objective and are used to demonstrate various gameplay elements, with the input by the player being shown on screen (a feature built into the game). Another type of videos is also produced frequently, aimed not at demonstrating useful techniques but at showing off the execution of a particularly difficult set of moves, thereby demonstrating the dexterity of the player. Sometimes authorship is attributed to the players who were the first to have successfully executed a difficult combo or have discovered a new technique.

Characters

As in many other fighting games, the characters in *Street Fighter IV* are heavily stereotyped. According to Hutchinson, (2007: 285) there are three primary reasons for stereotypical characters in such games. Firstly, such characters are easier to develop, therefore saving production time and cost. Secondly, the costs of localization for games with large export markets are equally lower for less complex characters. Finally, in fighting games players need to be able to “quickly and easily distinguish characters from one another, so players can recognize their opponent and adjust their fighting style appropriately”. (Hutchinson, 2007: 285)

While stereotypical depictions are far from absent in other types of games, the complexity of characters in fighting games is usually reduced to a bare minimum. The production costs and costs of localisation are factors in the development of any game; therefore the need for characters to be easily distinguishable should be useful in explaining the specifics of fighting games. In the *Street Fighter* game series characters differ significantly in key characteristics: regular and special moves, amount of health, damage caused

by their attacks, speed, jumping height, reach of their attacks, etc. It is important for players not only to know their own character but also the character of the other player in order to choose the most appropriate overall strategy and specific attacks.

Accordingly, discussions about the stories of characters and their motivations are in a minority relative to discussions about gameplay aspects, appropriate strategies and relative strengths and weaknesses of characters in specific match-ups. Since the number of available characters in the latest iteration of *Street Fighter IV* is 39, acquiring detailed knowledge about each possible match-up can be quite a daunting task. Here is an example from *Option Select*³, dealing with the match-up of two characters (Abel and Cody):

Fighting Abel is all about zoning him. Abel's walk speed is pretty similar to Cody's, and his Step Kick (his main poke), is pretty similar to Cody's s.MK. However, at mid range, Abel has a distinct advantage because the reward he gets for connecting a Step Kick canceled into a dash (even on block) is much bigger than the small damage Cody deals on a successful s.MK. The only poke Cody can utilize at this range to match the type of Risk vs Reward Abel is representing is c.LK OS MK Ruffian Kick because it gets him both respectable damage, and a knockdown across the screen.

This is only the first paragraph of a longer text, yet it is enough to get a feeling of the complexity of the game. Zoning for example refers to controlling space during a fight. Zoning for example refers to controlling space during a fight. Since the gameplay arena is limited on both sides and being forced into a corner severely limits the options of the player, this element of gameplay is considered of crucial strategic importance. An analysis of characters is therefore often focused on the range at which they are most effective and the strategies to achieve this range.

On the other hand the *Street Fighter Wiki*⁴ gives detailed accounts of characters' biographies, personality, and background story, revealing a focus on the narrative aspect of the game. Here we find a focus on what Newman (2005) calls the "canon": establishing and policing the boundaries of acceptable interpretations. For this purpose a border is established between the canonical and non-canonical content, for example on the *Street Fighter Wiki*: "Capcom USA initially claimed Akuma was possessed by a demon, but this is considered non-canonical."⁵ On the website www.fanfiction.net we can find a substantive amount of fan produced fiction set in the *Street Fighter*

³ <http://www.option-select.com/strategy/matchup/?m=103&c=1>

⁴ <http://streetfighter.wikia.com/wiki/Category:Characters?display=exhibition&sort=mostvisited>

⁵ <http://streetfighter.wikia.com/wiki/Akuma>

universe. The number of entries is 930, ranging in length from a few hundred to over 50 000 words. The entries are rated and discussed not only in terms of their creativity, but also in terms of their conformity to the canon. Although unfrequently, wider social aspects are also addressed, for example the representation of female characters in *Street Fighter* games⁶.

While this narrative focus should not be overlooked, it is the mechanical relationship to the characters that is dominant on the websites dedicated specifically to *Street Fighter* or a group of similar fighting games. Here discussions on the background stories and personalities of characters are almost completely absent and the characters are viewed more as player's tools than anything else. Consequently they are discussed in the context of gameplay mechanics and the way they perform during gameplay. When posting on these forums, the players talk about their experiences predominantly in terms of success in matches against other players. In this context the characters are seen as the medium through which the players act. Some characters are said to be weaker, some stronger (the strongest are sometimes referred to as "first tier"). Besides their overall strength characters are also grouped on the basis of several characteristics: some are said to be good for "pressure", some for "zoning", some are strong at close range, some at medium or far range, etc.

This intimate knowledge of characters is utilised by the game's developers, who encourage players to propose changes to game mechanics in future games.⁷ In their promotional materials they often stress the fact that feedback of fans is taken into account.⁸ In this way *Capcom* receives both material (the unpaid labour of consumers in development and promotion of the game) and symbolic (an image of being responsive to fans) benefits. This is not to say that the relationship of the company to the fan community is manipulative. It rather points to a path of inquiry that warrants further investigation: the ways in which video game producers and other companies mobilise unpaid labour of players as a strategic resource for their business operations.

Hacking the game

While commenting on the Grand Finals of the Evolution 2012 *Super Street Fighter IV* tournament, one of the commentators remarks the following: "He is minus one or minus two after that Jaguar kick, Raging demon is

⁶ For example: http://www.capcom-unity.com/street_fighter/go/thread/view/7411/20773081/who-would-like-to-see-more-females

⁷ http://www.capcom-unity.com/street_fighter/go/forum/view/7411/241285

⁸ For example: <http://www.youtube.com/watch?v=KrUcZyQUl6Y>

instant.”⁹ Surely incomprehensible to the uninitiated, “minus one or minus two” refers to the duration of time before the player is able to move their character after performing the last action. In this situation it means that the player attacking with the Jaguar kick (a special move) was left vulnerable for one or two frames (at sixty frames per second the duration of one frame is approximately 0.017 seconds) after the attack was blocked, giving the other player the opportunity to take advantage with an attack that is effective without delay (Raging Demon).

Understanding this comment requires a detailed understanding of game-play mechanics. As is explained on *Shoryuken*¹⁰:

You can see it in every move. Hit a button, and your character will start a move, hit the opponent, and then finish an animation. That's all these phases are: the period of time before your move hits the opponent, the period of time the move is hitting the opponent, and the period of time after the move hits the opponent.

So take those periods and break them down into those “animation frames” we just talked about. The start of your attack before it can hit the opponent is made up of Startup Frames. The animation frames during which your attack can actually hit the opponent are known as Active Frames. And everything that comes after those Active Frames are considered Recovery Frames.

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The details of jumping and landing animations are also conveyed in minute detail¹¹:

Just like how there are four Pre-Jump Frames at the start of the Jump, every character has four “Landing Frames” when they land from a Jump. However, how these four frames behave really depends on one factor: whether or not you perform a Normal Move during your Jump.

First of all, regardless if you attack in the air with a Normal Move or not, the Landing Frames will always prevent you from performing any form of basic movement. You cannot cancel the Landing Frames with a Dash, a Crouch, or another Jump. However, you can always Tech Throws during your Landing Frames.

However, you are allowed to cancel all four Landing Frames with pretty much anything else if you do not perform any Normal Moves during your Jump. Special Moves, Super Combos, Focus Attacks, Throws, and even Normal Moves can all be performed the instant you land.

⁹ <http://www.youtube.com/watch?v=9GFvZJ2eW68> (at 3:15)

¹⁰ http://wiki.shoryuken.com/Super_Street_Fighter_IV_AE/Controls_and_Terminology

¹¹ http://wiki.shoryuken.com/Super_Street_Fighter_IV_AE/Game_Systems

And most importantly, you can Block during the Landing Frames. That means if you do not press a button in the air, you cannot be punished when landing from a Jump even if the opponent makes you land into their attack.

These lengthy quotes illustrate the level of involvement with the game-play engine that some players exhibit. The number of start-up, active and recovery frames is referred to numerous times in discussions on websites as well as commentary on tournament matches. Knowing the exact duration of moves has several applications: it can be used to inform players whether certain combinations of moves are possible and thereby it dispenses with the need of learning this fact via trial and error; consequently this information can be used to plan and practice moves and strategies; it can also be used during matches to execute moves that require extremely precise timing.

The online discussions on *Street Fighter IV* reveal not only an emphasis on intense training, needed to master the game, but also a very methodical approach to training, revealed not only through the analysis of animation frames but also of various techniques aimed at using the algorithm of the game to the player's advantage. At the most basic level this means discovering short-cuts (in certain cases the game recognises an input even though it is not executed perfectly) and ambiguities that players can take advantage of during gameplay. These techniques are generally not regarded as cheating. This is most likely due to the fact that they require a substantial amount of knowledge and skill to execute and are therefore not seen as "cheap" ways to gain an advantage. They are not seen as transgressions that break the gameplay experience, but as legitimate techniques that competent players must master in order to be competitive.

Two more advanced techniques are called "option selects" and "auto-corrects." Option selects are acts of deliberately inputting contradictory commands, letting the game decide which action is most appropriate for the situation. Since characters can perform only one move at a time (for example, the character cannot execute a punch and a kick at the same time), the game has a system of prioritizing actions based on context, a fact the players can take advantage of.

Auto-correct also relies on the game helping the player out, although in this case it does not choose among multiple inputs, but corrects the direction of a special, super or ultra move. Although the input for the move is in the wrong direction, the game nonetheless executes the move if characters switch positions in the instant that the command was inputted. As one user explains on the Capcom forum¹²:

¹² http://www.capcom-unity.com/street_fighter/go/thread/view/7411/21011637/question-what-is-auto-correct-in-sf4?post_num=3

#2 Auto correct is when someone crosses you up, and you were inputting a special/super/ultra input. You input the command first and abuse the new extra time in the buffer system of IV and hit the attack button after they crossup and cause the move to go the opposite direction.

EX: You are using Ryu (on left side), they are using Bison(Dictator) on right side, They jump at you (from cross-up distance). You input QCF to the right twice and then don't hit the PPP until he crosses your center of mass. You then hit PPP the system auto corrects your direction and Slays him with the Ultra. The key to this technique is to not do the motion too soon, and abuse every possible frame of the buffer at times.

Playing *Street Fighter* seems to be very similar to the competitive play of the first person shooter game *Counterstrike*, analysed by Witkowski: "Playing Counter-Strike in the context of the LAN is a rich sensory experience that calls for layer upon layer of physically demanding action in order to be competitive in the high-performance game." (Witkowski, 2012: 369) Consequently, constant practice is needed to gain and hone the skills necessary for competitive performance. Progress in *Street Fighter IV* is not understood as meeting predefined in-game criteria. Players cannot level-up characters like in role-playing games; they can progress by honing their skills through constant practice that improves their motoric skills and reflexes, and by devising a strategy and learning to anticipate the moves of the opponents.

Conclusion

The analysis has revealed a profound immersion of *Street Fighter IV* players into gameplay mechanics. They analyse the minutest technical details of the game engine to gain a competitive advantage and have developed a terminology that covers both technical and strategic aspects. My analysis is congruent with the findings of Oswald et al. (2013: 14):

Our results support the notion that video game play can be studied as a recreational activity, akin to sports and other hobbies. Participants actively set goals for their game play time, they evaluate the outcome of the game play in terms of success and failure, and they actively seek social relationships, friendly, cooperative, and competitive, during their gaming.

The "story" of *Street Fighter* takes place to a large degree outside the story inside the game itself: success or failure to master a technique, frustration at not getting better, dedication to improve with practice are themes often encountered on forums.

It should be noted that the analysed websites may not be representative of all *Street Fighter IV* players. Indeed, it is likely that casual gamers do play the game but do not wish to engage in all its complexities and intricacies and are consequently not represented in the online discussions I have analysed. To what degree the involvement in gameplay mechanics that was revealed in my analysis is present among players of the game is a question that needs to be addressed with further research. Furthermore, *Street Fighter* is likely a specific case that should not be generalised to all games and to all players without further reflection and research. While it is likely that we would be able to identify a similar orientation to gameplay mechanics in many other games, the specific design of fighting games like *Street Fighter* makes such an orientation much more likely. Therefore, it is likely that such a focus on gameplay mechanics would be far less widespread in many other types of games. On the other hand, there is no reason to believe we are dealing with a phenomenon exclusive to fighting games. Newman's discussion of walkthroughs for example reveals many similarities: "Walkthroughs are written by and for players who not only wish to complete a game, but players who want to know a game. More than this, players who wish to know every conceivable aspect, feature, affordance, and indeed, glitch and inconsistency of a game." (Newman, 2005: 59)

Finally, one aspect I was only able to address briefly is the political economy of player produced content. Players perform a significant amount of unpaid labour that can be used by companies as a strategic resource for their business operations. Game developers and publishers can use it to cut production costs, increase the effectiveness of their marketing and use it to boost their corporate image, while the owners of the sites that host content produced by players can take advantage of it to increase their advertising revenue. This aspect has not received sufficient scholarly attention and should be the object of study in the future.

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