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STS 145 Game Review
Street Fighter II

Introduction

"Street Fighter II", developed by Yoshiki Okamoto's[1] team at Capcom Entertainment, was originally released as an arcade machine using Capcom's CPS chipset[2] in March 1991 (Japanese release). Its success led to subsequent releases on the SNES, Genesis and Playstation consoles, as well as the PC and Macintosh. Versions of the game running on emulators are also widely available, the most well known of which is MAME.

I believe that the game serves as a representative and seminal example of the 'fighting game' genre which currently comprises a large proportion of the coin-op and console gaming market, of which the most well-known examples are the 'Virtua Fighter', 'Tekken' and 'Mortal Kombat' series, as well as the 'Street Fighter' series itself, which at last count included approximately 30 distinct sequels or variations.

The representative 'Fighting Game'

When using the term 'fighting game' in this report, I refer only to games in the format described below, and not other types of action game involving fighting such as the "beat-'em-up" genre, which involves cooperative play against a large number of AI opponents.

The typical structure of a fighting game centers around physical, one-to-one combat between a player-controlled sprite/polygonal character and another character, which can be either computer or player controlled. The physical dimensions of the combat arena are constrained to be small relative to character size, resulting in an emphasis on physical combat and larger character sizes (relative to screen size) than other types of videogame.

Both characters are capable of a variety of actions which can usually be classified into three categories:

- Movement, at least including walking, jumping and crouching, and possibly other types of movement such as running and flying[3].

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[1] Following "Street Fighter II", Mr. Okamoto became head of R&D at Capcom. He currently works as Director of Flagship, a company he founded in 1997.

[2] The CPS chipset is Capcom's standard arcade board. Subsequent versions of it, CPS-2 and recently CPS-3, currently power Capcom's arcade games; Street Fighter II was one of the last games to use the CPS board. Incidentally, as a reaction to emulation of Street Fighter II and other arcade games, Capcom encrypted all data on the CPS-2 and CPS-3 chipsets. The encryption on CPS-2 has only recently been broken (January 2001 - http://slashdot.org/articles/01/01/07/0246252.shtml)

[3] We could also note that fighting games tend to focus on two-dimensional movement (linear towards the opponent and vertical movement). Although polygonal fighting games have changed this somewhat, the primary focus is still on two-dimensional movement.

- Attack, typically involving direct physical contact such as punching, kicking and grappling, although weapons and extraordinary powers such as firebreathing are also common.
- Defense, which involves a reflexive action to reduce or nullify the damage taken from an attack. The most typical defense is a block, although more elaborate actions such as dodging and ducking are sometimes available.

The basic unit of the game is the match. Each match between two characters consists of multiple (typically three) 'rounds' of combat. A successful attack depletes an energy bar associated with the other character, and the object of each round is to deplete the opponent's life bar to zero. The player winning a majority of the 'rounds' wins the 'match'[4].

It is significant to note that there are two potential sources of victory in a fighting game. If the computer controls the other character, the player engages in a series of matches of increasing difficulty, and the objective is to win an unbroken series of matches to reach the ending of the game. If another person is playing, however, there is only one match between them; the losing player is ejected. The goal then becomes repeated competitive domination of challengers and avoidance of losing, and it is possible to spend hours at a machine defeating a constant stream of challengers with no apparent long-term goal, similar to some classic arcade games[5].

History of fighting games to 1991

The earliest precursor to Street Fighter II that can still be considered to be a fighting game is probably "Yie Ar Kung Fu", developed by Konami (1985). Running on a M6809, 1.25MHz chip, it implemented player-computer combat only (two-player mode simply resulted in alternate control of the player's character). Characters were sprites; backgrounds were solid colours. Some characteristic fighting game commands were present, but attack was limited to a single punch, kick and flying kick; defensive commands were nonexistent. In addition to this, delayed joystick response and poor design made coordinated player control extremely difficult, turning each game into essentially a random process[6].

The essential components of a fighting game, however, were already present: life bar, repeated match structure (although 'rounds' were absent), exaggerated movement and attack styles. The extension of these elements can be seen in the first Street Fighter, developed by Capcom (1987). Running on an 8MHz chip with eight-way input, the backgrounds were now sprites. The three round structure was introduced, as well as

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[4] I notice that, with this definition, some sports games such as wrestling and boxing would qualify as "fighting games"; indeed, the round/match terminology was probably borrowed from these sports. I do not consider with these games in this report, believing them to belong to a different category. In addition to this, sports simulations do not tend to have a 2-D frame of movement (see footnote 3)

[5] Although some fighting games have scores, this aspect is typically deemphasized by most players and typically hi-scoring is not a motivation for continued play.

[6] It is interesting to note that as fighting games have developed, the relative size of the combatants in relation to the screen has tended to grow; "Yie-Ar Kung Fu" characters were only an inch tall on an arcade screen. Sprite-based characters, however, have not grown significantly since Street Fighter II; the advent of polygonal games, however, has resulted in characters almost the entire height of the screen.

competitive play; the defensive block was introduced and basic foundation for Street Fighter II was created. In addition to this, the 'special move' was introduced (see below) for the first time.

It might initially seem that Street Fighter, rather than Street Fighter II, successfully implemented all the characteristics of a true fighting game, and that one should consider Street Fighter as the seminal game. However, Street Fighter was not particularly successful commercially, and it appears that the game had little influence on other companies. The only notable game in the genre between 1987-1991 appears to have been a Sega game, "Tongue of the Fatman" (1990), which demonstrates a reversion to "Yie-Ar Kung Fu", without defensive maneuvering or great strategic depth. The primary reason for this lack of success can be attributed to a flawed design paradigm: character movement had little strategic value and was jerky. The 'Yie-Ar Kung Fu' jump was useless as a strategic maneuver, since it sent the character in a two-second arc across the screen, but the 'Fatman' jump was useless for the opposite reason - a half-second hop which barely moved the character at all, giving no incentive to use a jump attack as opposed to a standing one. As detailed below, Street Fighter II addressed these problems to a great degree.

Test Equipment

Street Fighter II originally ran on a CPS-1 board which ran at 12MHz. Video resolution was 384 x 224, and the system was capable of 16 colour display to a TV output with three separate graphics planes (for background, characters etc.), with a maximum of 256 sprites of size from 16x16 to 240x240. Z80, Yamaha-2151 and OKIM6295 chips were used for sound; input came from two 8-input joysticks with six buttons each (two additional buttons for player selection).

It was not possible to obtain an arcade version of the game. MAME was used to simulate the game; this solution provided most of the original functionality, but input response was sufficiently compromised that many strategic nuances of the original gameplay were difficult or impossible to replicate on a keyboard. In establishing these aspects of the original game, I have therefore relied primarily on secondary sources[7].

Street Fighter II gameplay / design analysis

Street Fighter II, like its predecessor, is an entirely sprite-based game. Backgrounds and characters are animated entirely as two-dimensional sprites, although perspective creates a three-dimensional effect. Animations are much smoother in comparison to Street Fighter, and background animations are also evident.

The game follows all the design conventions for fighting games described earlier. Match/round structure is present with a time limit; a player needs to win two out of the three rounds to win. Combat consists primarily of direct physical attacks, although exceptions exist in the form of "special moves" (see below). Crouching, jumping, attacks and defense are implemented; defense takes the form of a block, which reduces damage to a small but noticeable amount. The action of blocking is immediate, achieved by

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[7] MAME was also used to simulate 'Yie-Ar Kung Fu' and 'Street Fighter I' for this review. 'Fatman' was played on the original Genesis platform.

holding back on the joystick when an attack hits. Blocking cannot occur, however, if the character is in the air or currently attacking.

It is immediately apparent that the act of blocking implies a tradeoff. In order to execute an attack, a player foregoes the opportunity to defend, thus making himself vulnerable. In addition to this, jumping (which is both an offensive and defensive maneuver, since most standing attacks will miss an airborne opponent, while the jumper gains the opportunity to attack) leaves a player unable to block. This system of tradeoffs between offense and defense generates the strategic balance of the game; in previous fighting games, matches degenerated into pure, random attacks, and victory was essentially random as well.

Another strategic tradeoff is present within the act of attacking itself. Of the six available buttons, three for punching and three for kicking, each button corresponds to a level of attack – weak, medium or strong. The weak attack is extremely fast, but inflicts low damage; vice versa for the strong punch. In a time-critical situation, a player using a strong attack will likely fail to inflict damage and be hit, but if a player constantly relies weak attacks, he is unlikely to inflict enough damage to win the round. This system again represents a marked departure from previous fighting games, and adds greatly to Street Fighter II's depth.

In my opinion, this is the central innovation of Street Fighter II: the strategic tradeoff. It appears to inform the entire design philosophy of the game, and as a final example, we consider character selection. Players have a choice between eight different characters, each of which forces gameplay to proceed in a different manner. We consider two characters: Dhalsim, an Indian yoga, and Chun-Li, a Chinese martial artist. Chun-Li is the most agile character in the game, and has the fastest attacks, fastest movement and is also capable of "double jumping", extending her jump range. However, she has very short-range attacks, and can only engage in physical combat. Dhalsim, on the other hand, is by far the slowest character, but through 'yoga' can extend his limbs, giving him attacks which stretch almost the length of the screen; he is also provided with a projectile attack which allows him to attack at range.

In a match, the two characters must be played in totally opposing fashion: Dhalsim wins by pushing the opponent as far back as possible to take advantage of his attack range, while Chun-Li uses superior speed to engage in direct, close combat, where she has the advantage. Although both "Street Fighter" and "Tongue of the Fatman" allowed the player selection of different characters, neither game exhibited this strategic aspect to character choice.

In addition to strategic sophistication, however, Street Fighter II was significant in that improved technology made motor sophistication a much more significant aspect of the game. The most overt demonstration of this lies in the "special moves" which each character could execute, a feature which has become standard in modern fighting games.

A 'special move' is the extrapolation of the idea that the position of the joystick modifies the effect of some other input, such as a button. This idea was already implicitly present in Yie-Ar Kung Fu, since a jump-kick (when the joystick is pushed up) was clearly different from a standard attack. Street Fighter elaborated this concept, introducing a move such as the "fireball" whose execution required a complicated set of joystick motions (to be precise, a quarter circle) combined with a timed button press.

This development was not effective in Street Fighter because delayed joystick and button response made the execution of a special move essentially a random process, stripping the action of both strategic utility and the incentive to practice. Street Fighter II, however, in addition to better joystick recognition, utilized a greater amount of RAM and thus was able to partially buffer the control inputs. Paradoxically, this made joystick motions easier to recognize, but increased the complexity of moves that could be required (the most complex move requires a 360 degree cycle of the joystick)[8]. The elaboration of the special move today has progressed to the point where in the 'Tekken' series, a single move can take approximately thirty seconds to execute, with fifty distinct joystick motions and button combinations.

It should be noted that Street Fighter II, despite the large number of innovations introduced, did not necessarily represent a revolutionary change in the nature of the fighting game. The graphical and aural aspects of the game, though impressive, did not represent any real improvement over other games on the market at the time. Computer AI was horrendous: with two hours of practice, a player could develop a repetitive strategy sufficient to complete the game[9]. It can also be argued that the increased motor requirements, while increasing replay value, fail to add any real strategic depth to the game; we note however that no real replacement for the 'special move' has so far been found. However, the game was extremely successful; beyond the name recognition and popular culture effect, Street Fighter II revived the coin-op market which had been "basically flat" since 1984; it is significant that around 1991, when Street Fighter II was released, only the top three games made a significant profit (RePlay Magazine report).

Conclusion

The commercial impact of Street Fighter II on game design and the structure of the videogame industry is self-evident. Before 'Street Fighter II', there was no recognizable fighting game genre and there were no fighting game franchises; the 'Street Fighter' series alone has now spawned 30 titles. 'Street Fighter' has also shaped the conventions of the genre; few fighting games deviate from the three-round energy bar structure that Street Fighter employed, and the Street Fighter character archetypes have become so prevalent that most fighting games include a 'Ryu' character, with strategy and moves similar to Street Fighter II's main character. In addition to this, the press credibility of the Playstation 2 and the Dreamcast console has effectively been dependent on the quality of their respective fighting games[10].

The social impact is more difficult to evaluate. It is clear that Street Fighter II has had a massive effect on the 'arcade subculture' as elaborated in Loftus and Loftus. In a similar fashion to FPS games such as Quake and Doom, certain styles of play ('ticking' in the US; 'fireball trap' in Hong Kong) were banned because of their "cheapness". In addition to this, the arcade community evolved new modes of behaviour: in Hong Kong,

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[8] Timing issues were still flawed in some ways: if a button was held down, the game would execute an attack again when the button was released.

[9] This problem continues to plague fighting games today. One can easily argue, however, that this aspect of the game is irrelevant due to the emphasis on player-player competition.

[10] 'Tekken Tag Tournament' and 'Soul Calibur', respectively. In addition, see "Dead or Alive 2: Playstation2 vs. Dreamcast" (http://ps2.ign.com/news/17613.html), where console performance is explicitly linked to performance in the fighting game 'Dead or Alive 2'.

an elaborate system of rules were generated governing the conduct of competitive Street Fighter II. For instance, it was understood that if a player won the first round, he would automatically concede the second round so that both players could play the full three rounds; if he disobeyed, he was obligated to pay for the other player's game. The system was frequently enforced by triads (criminals) in the arcades.

More interesting perhaps is the nature in which the structure of video gaming has been changed by the fighting game. The arrival of Street Fighter II and the subsequent proliferation of fighting games emphasizes the competitive aspect of gaming. "Alternate turns" have largely fallen onto the wayside in favour of multiplaying capability, and cooperative multiplaying has certainly grown, but gaming now tends to be dominated by player-player competition (again, the FPS and RTS genres are examples of this tendency). It would be preposterous to claim that this trend is due to the success of Street Fighter II; insofar as it was significant in the evolution of the fighting game genre, however, the game perhaps represents a certain turning point in the nature of gaming, towards a paradigm where victory over other players becomes the driving, and perhaps destructive, purpose of the game.

Bibliography

Caesar – Catalogue of Arcade Emulation Software, "Yie Ar Kung Fu – Set 2".
http://www.logiqx.com/caesar/html/emus/single/yiearkungfu/yiear.shtml

Gamespot, "The History of Street Fighter".
http://www.videogames.com/features/universal/sfhistory/history04.html

Ign.com, "Interview with Yoshiki Okamoto", http://psx.ign.com/news/2941.html

Ign.com, "Dead or Alive 2: Playstation vs. Dreamcast". http://ps2.ign.com/news/17613.html

PlanetDreamcast, "Sega History". http://www.planetdreamcast.com/about/sega/

RePlay Magazine, "Coin-Op history -- 1975 to 1998 -- from the pages of RePlay".
http://www.replaymag.com/history.htm

ZDNet Gamespot, "History of Sega Fighters". http://www.videogames.com/features/sat/segafight/

Information on the CPS-1 board from
http://arcadedev.vintagegaming.com/documents%5Ccps1.html