Miikka Ketonen

Designing a 2D fighting game

Tradenomi

Tietojenkäsittely

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Tässä opinnäytetyössä käsittelen 2D-taistelupelejä, niiden suunnitteluteoriaa ja elementtejä, jotka löytyvät useimmista genren peleistä. Tavoitteeni on suunnitella 2D-taistelupeli, joka tuo jotain uutta genrelle ja taistelupeliyhteisölle.

Alussa esittelen genren ja sen historian lyhyesti. Käyn läpi genren eri variaatioita ja yleisimpiä hahmo arkkityyppejä. Tämän jälkeen käyn läpi taistelupelien ideamaailmaa ja syitä, miksi tietyt ratkaisut ovat vakiintuneet. Opinnäytetyössä tulen käyttämään lähteinä artikkeleita eri pelinkehittäjiltä sekä omaa tietoani genrestä.

Myöhemmin tulen käymään läpi oman suunnitteluprosessini ja syyt ratkaisuilleni 2D taistelupelissäni. Viimeiseksi tulen analysoimaan pelisuunnitelmani vertaamalla sitä taistelupelien suunnittelufilosofiaan.

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ABSTRACT

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In this thesis I will talk about 2D fighting games, their design philosophy and about elements that are commonly found in them. My goal is to design a 2D fighting game that would bring something new to the genre and would fill a need in fighting game community.

In the beginning I will give brief presentation into the genre and its history. I will go through variations in the genre and different character archetypes. After which I will go through the thought process and purpose behind the fighting game design. I will be using articles from fighting game designers and my own knowledge of the genre during it.

Later I will go through my own design process and reasons behind my decisions for my 2D fighting game. Finally, I will analyze my design by comparing it to the philosophy and purposes behind fighting game designs.

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1 INTRODUCTION

While most games focus on giving players relaxing time, fighting games go against this way of thinking. Because of their high entry barrier, the fighting game genre has always been niche. Even among competitive players, fighting games have never reached as huge popularity as other competitive games. Nevertheless, fighting game community attracts dedicated players that are willing to spend the time to learn these difficult games.

Fighting games as we know them nowadays emerged during the golden period of arcade halls. Fighting games short play sessions, player versus player and competitive nature suited well into the dark rooms of arcades. During the downfall of arcade halls, fighting games also saw a drop in popularity. This lead into a decade of obscurity and silence as the genre saw few new games. The rise of online gaming ushered in a new era of fighting games as the need of physical arcade machines disappeared and players could find other players from their couch. Fighting games gained new rise in popularity and once again new games flooded the market

While the high entry barrier makes it difficult for the new players, the deep and challenging gameplay has created a dedicated group of followers. This thesis tries to determine what the reason is for this by studying the gameplay of fighting games. Using the found knowledge, this thesis also aims to create a new fighting game.

2 2D FIGHTING GAMES AS A GENRE

Fighting games are a genre of games where the focus is on one versus one matches against another player or computer using a wide variety of characters. The objective usually is to deplete other character's health with different means. Fighting games are highly skill-based games, which leads to their competitive nature. Because fighting games focus on one versus one, they are mostly played against other players. This can be seen in the lack of single player content. (Dargenio 2014, Fanell 2011, Racketboy, 2011)

Fighting games have many easily recognizable features that you can find in almost all of this type of games. Character rosters contain many easily recognizable characters with distinct appearance and fighting style. This makes them easily distinguishable during hectic matches. The user interface in fighting games is similarly very unique to the genre. It is polished to give players the needed information quickly and easily. (Dargenio 2014, Fanell 2011, Racketboy, 2011)

Many 2D fighting games also share gameplay mechanics between each other. Combos, which are moves strung together, are an important aspect of fighting games. Because of this fighting games include a variety of punches and kicks. They vary by strength and speed, which allows players to do a different type of combos. Also, one very essential feature is special moves which are on every 2D fighting game. Special moves are unique skills that allow characters to do unusual attacks, such as throwing fireballs and they are done by doing certain but-ton patterns. These moves give the characters their own unique playstyle and make them stand out from each other. (Dargenio 2014, Fanell 2011, Racketboy, 2011)

2.1 History of 2D fighting games

The first fighting games appeared on home consoles and arcade machines in the early 80's. However, these games were far away from modern fighting games that form the genre. The player's objective was to fight against single AI-controlled

opponent to proceed to the next level. Such games were called karate game because one of the first game of the genre was Karate Champs which can be seen in figure 1. Even though karate games resembled modern fighting games and laid the foundation for them, they still share more with modern beat em' up games. (Dargenio 2014, Fanell 2011, Racketboy, 2011)

Figure 1: Karate Champ (1984)

One of the most important steps was Capcom's Street Fighter which was published in 1987. It was a link between karate and a fighting game. It had many basic mechanics in it that are still used today. These mechanics were different strength attacks, blocking by pushing backward and special moves. This type of hybrid games brought the genre towards the future and gave birth to new innovations that are still part of fighting game genre. However, these games still resembled beat em' up genre and they lacked the most important feature, player versus player matches. (Dargenio 2014, Fanell 2011, Racketboy, 2011)

Figure 2: Street Fighter II (1991)

The title of the first fighting game depends on the perspective and the used attributes. However, the first game to resemble a modern fighting game was Street Fighter II, Figure 2. It established a number of basic features and created a reference point for other games in the genre. Street Fighter II also included a wide variety of playable characters. Previous games usually had two or three playable characters. Street Fighter's eight characters also created a basis for character archetypes that are commonly found in the genre. However, one feature separated Street Fighter II from the rest and it was the focus on player versus player. Also, glitches found in the gameplay shaped the genre. Thanks to these, a variety of techniques were developed for fighting games. For example, canceling, which is when a player interrupts his previous attack with the next attack. Originally this was a bug, but because it brought more value for the game, it was further developed. After Street Fighter II, the fighting game genre became extremely popular. After a number of iterations and ideas, the market is currently full of different type of fighting games that offer different experiences. (Dargenio 2014, Fanell 2011, Racketboy, 2011)

2.2 Differences between 2D fighters

Even though fighting games share many mechanics and basic elements between each other, there are several subcategories. Each of these subcategories has their own unique gameplay and features. They usually differ from each other by how moves are executed, how fast the gameplay is and what is the focus of the gameplay. Subcategories affect largely what type of characters, moves and mechanics there are in the game. 2D fighting games can be divided into three larger subcategories. However, there are many hybrid games that loan elements from multiple categories.

The most popular subcategory contains games such as Street Fighter and Mortal Kombat. Gameplay in these is generally slower paces, ground-based and focuses on keeping correct distance between characters. This type of situation is called footsies. Players then try to open up another character by using long distance attacks which are called pokes. For example, in figure 3 the character on the left uses long range fireball move to pressure his opponent. Used from the correct distance it is a safe move. This allows the player to control the match and punish another player's mistakes. Combos in these types of games are short and after them, it is quite common to take the original footsie distance. (Miller 2014)

Figure 3 Street Fighter IV (2009)

Next subcategory is the team-based fighting games. A good example of this category are games such as Marvel vs Capcom and Skullgirls. Players fight by using teams of two or three characters. They control one character while the others wait in reserve. Having access to more than one character offers unique gameplay mechanics. The most common are in the form of assist attack where the player can summon one of his reserve characters to do an attack. This can be used either offensively or defensively. For example, in figure 4 the player on the right has used an assist attack (the middle character) which allows him to take distance safely. Players can also switch their active character which gives access to their different move set. Team based fighting games are a fast paced and more aggressive compared to footsie based. Fights also happen more in the air as characters have more movement options in the air. (Co 2012)

Figure 4: Ultimate Marvel vs Capcom 3 (2011)

The third subcategory is so called "air-dasher" games. The name comes from the fact that characters in these types of games can dash back and forth in the air. The movement in the air is very important and characters have access to a broader move set in the air. Air dashers are very fast paced and combo-heavy games. The gameplay is very aggressive and hectic. It is very important to be able to keep the pressure on the other player and control the flow of the game. Characters' move sets are designed with this aggressive playstyle in mind. Characteristic trait to these games is also imaginative and wild moves. For example, in the figure 5

character on the left can manipulate his own shadow and control it like a puppet. The player has to control these two characters at the same time. (Sirlin 2014)

Figure 5: Guilty Gear Xrd (2015)

3 DESIGN PHILOSOPHY

For a fighting game to be considered competitive, it must contain certain elements. Usually, these elements are also the reason why you can say that the fighting game is fun. The fighting game has to feel right. This feeling can be divided into different parts. (Bycer 2014)

In fighting games, controls has to be perfect. Players have to react to their op-opponent's movements and make decisions in quick succession. Certain combos can contain strict time frames (frame is a single picture of a move) where the player has to be able to perform the next move. Most fighting games run at 60 frames per second, some combos can contain even one frame links which mean the player has 1/60 second to make a move in the correct section. A linking is an act of using fast attack right after the previous one has ended. For these to be possible controls has to be responsive. (Bycer 2014)

Characters has to also have a certain flow to their moves. Matches are rarely decided by single moves. Instead of fighting game's engine should allow players to link their moves together. The transition from move to move is what allows players to do combos which are the most important source of damage. The most common way to allow transition is from light attacks to heavy attacks. This makes the system fairer as players cannot abuse certain string of moves and al-lows breathing between the combos. Most of the time combos are not programmed into the game. Instead, players themselves experiment and try to find out the optimal combos. Designers can give their characters combos that go against this rule by creating so-called target combos that are character specific. This way the characters get tools that complement their move set. (Bycer 2014)

3.1 From dragon punches to fireballs, use of moves

Because situations are fast in fighting games, players have to be able to make decision in small fraction of time. To be able to react to the opponent's attacks, the player has to have clear idea what his character's moves do. Because of that, no matter which game we are talking about, every move always has to have a purpose. They range from counterattacks to control moves. Moves can be divided into basic attacks, which form the core gameplay, character specific specials and super moves. (Sirlin 2011)

Every move has their basic attributes: speed, strength, range and hitbox. Usually the faster the move is, the weaker its strength and vice versa. Fast moves are meant to be combo starters and to counter opponent's attacks. Stronger moves are instead meant to do damage and to end combos. Combining different moves players can do a different type of combos depending on the situation. The range and hitbox can give moves specific purposes. With them, players can better respond to their opponent's moves. For example in figure 6 the upward kick which is meant to counter jumping attacks or the figure 7's long ranged attack which is a safe poke. In both of these pictures, the red boxes show the area where the attack hits while the green boxes show where the character takes damage. Because of the range and hitbox, the moves are quite riskless. (Lambottin 2012)
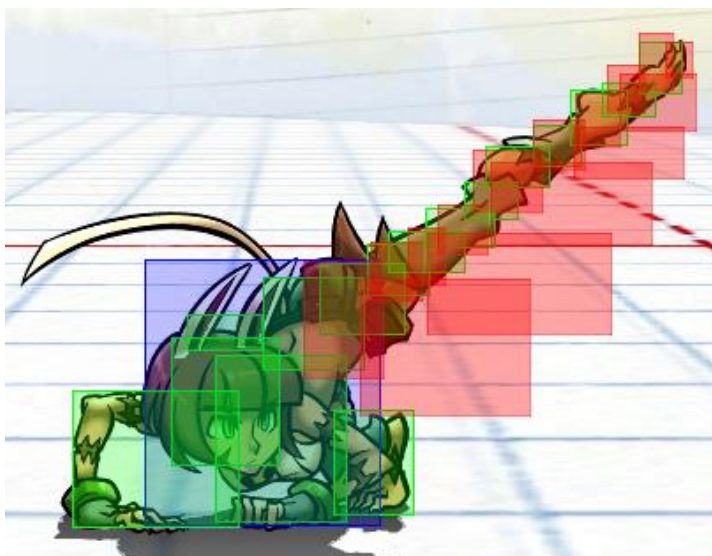

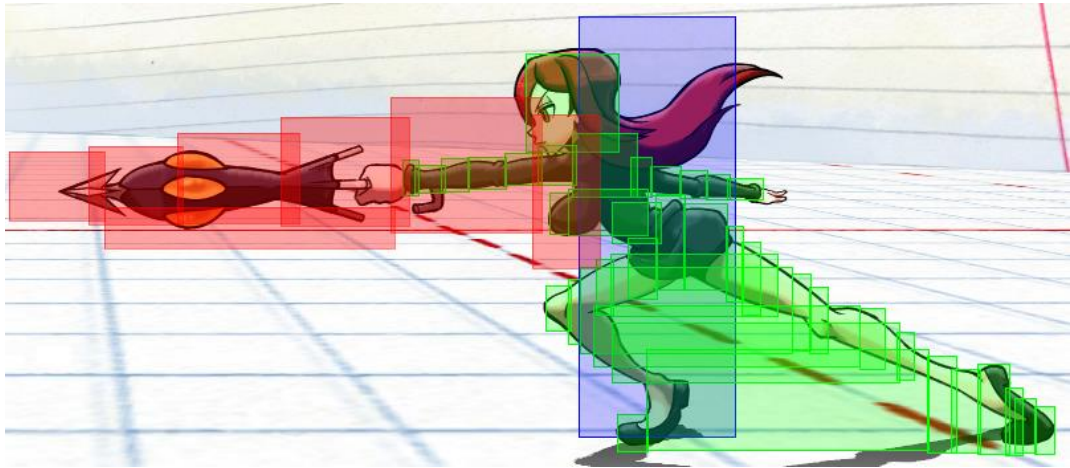Figure 6: Skullgirls (2012) Basic anti-air attack.

Figure 7: Skullgirls (2012) Basic poke attack.

Basic moves form the core of the gameplay. To give the game more depth, characters get a variety of special moves. They clearly differ from basic moves and give abilities that other characters do not have. Special moves also affect the character's playstyle because a different type of moves suits for different purposes. This guides players to certain playstyle as certain tactics are more effective. It can be said that the character belongs to a certain archetype. Archetypes can be separated into playstyles that support offensive, defensive or combined gameplay. (Sirlin 2011)

Characters also get super moves which have many advantages over other moves. They can be highly damaging and activate almost instantly. To compensate their power, they are tied into the super meter. The player has a limited amount of this meter in their use so it is important that they are used correctly. When used on right time they can change the course of matches or end it quickly. It is important for designers to balance them properly to avoid overpowered moves. (Miller 2014)

3.2 Character archetypes in 2D fighting games

Fighting games are known for their characters. While they are easily distinguishable from each other by appearances, their playstyles are as distinct from each other. Most of the characters belong to certain archetypes that are a

core aspect of fighting games. Archetypes help players to get the general knowledge of characters relatively fast and that is why they are commonly used.

Shoto is a character type that can be said to be a jack of all trades, master of none. They have all the needed tools in their move set and they usually lack any noticeable weaknesses. Basic shoto move set includes projectile, excellent anti-air attack and slide move that can be used to close the distance. Shoto characters, however, suffer from their middle of the road playstyle. They do not excel in any aspects of the game which can lead to situations where other characters can overrun them with their strengths. (Smashpedia)

Charge characters get their name from the way their moves are performed. Like the name implies the move has to be charged before it comes out. While this makes the performing of the move slower, they are fast moves that have an advantage over other moves. Playstyle for charge characters is usually defensive which allows player be in control of the match flow. However, charge characters suffer if the opponent gets through their defense as they cannot perform their moves on the spot.   (Smashpedia)

Rushdown characters sacrifice all long distance moves for superior close combat. They excel in face to face type of playstyle where their strong moves allow them to keep pressuring their opponent. However this forces them to be close to their opponent as their moves get worse, further they are. (Smashpedia)

Glass cannon is an archetype similar to rushdown. They excel in close combat situations and pressuring their opponent. Glass cannons usually are the fastest character in the roster and they have excellent mobility which makes punishing their moves difficult. As their name implies their weaknesses come in form of low health and poor defensive options. (Smashpedia)

Zoners are the polar opposites of rushdown characters. They excel in neutral and long distance situations. Zoner's move set is meant to keep the opponent as far away as possible and to poke them to death from distance. They usually have

multiple projectiles to make the approaching them difficult. The tradeoff, however, is the complete lack of close combat moves. (Smashpedia)

Grapplers are characters that have destructive throws that do a huge amount of damage. To perform these throws grappler has to be close to their opponent and do complicated input motion. To offset the amount of damage they can do grapplers are slow and they may have weaker movement options. (Smashpedia)

Puppet character is one of most unique archetypes because the player has to control two characters at the same time. The characters can be divided into the main and secondary body. The main body is the actual character player controls while the secondary body can be controlled with simple inputs. This allows the player to do attacks from multiple directions. The control of the puppet is usually tied into a meter which decreases when the puppet is used. This may lead to situations where the player cannot control the secondary body. The main body is usually quite weak on his own so losing the secondary body is very punishing. (Smashpedia)

Tricksters are also quite unique and odd archetype. Their move set includes randomization and deceptive moves. Typically tricksters have some sort of teleportation which forces the opponent to guess where the character will appear. Also, one common move is item throw which is completely random. These items can be either good or bad for the player. However because of the randomization, the opponent cannot know what will come out. This leads to unexpected situations where the trickster can take control of the match. Because tricksters cannot control the outcome of their moves it can also backfire on themselves. (Smashpedia)

3.3   Single character or a team?

How many characters player has to use affects the game tremendously. Fighting games usually use one, two or three characters. It is important to go through the benefits and faults that different team sizes bring. Different team sizes suit better

into different types of fighting games. Larger team's suits into more hectic and fast paced gameplay as they give players more variety of tools. In the other end, slower gameplay is easier to do and manage with one character. Of course, nothing prevents the creation of a game that goes against the norm and hybrids are rather common. While team fighting games bring a lot to the table, there are many aspects that have to be taken into account. If a player has to use multiple characters it also brings many difficulties. (Co 2012)

One most important factor that has to be taken into account is the difficulty. Larger team size makes the game much harder to learn as players have to use multiple characters at the same time. Also combining characters move sets may be difficult for new players, as characters moves have to be usable together. Characters have to be compatible as it makes the whole team work better. Optimization of your team is a big part of fighting games that use multiple characters. This brings another meta gameplay aspect into the game. (Co 2012)

Naturally, when both players have two or even three characters in the field at the same time it can make the game quite hectic and hard to follow. Fighting games that use multiple characters are generally really fast paced and the damage output is high. This may lead to situations where the player has no idea what happened during the match. This makes approaching the game harder as the entry barrier is higher. (Co 2012)

4 IMPORTANCE OF BALANCING

Because of their competitive nature, fighting games has to be fair to play. Neither of the players should have a significant amount of advance over another. Failure in balance, either in the form of overpowered character or tactic, usually leads to the game's early death. Well balanced game keeps players interest for a long time as it creates an interesting competitive scene. That is why it is especially important to spend lots of time balancing your game. Balance in fighting games is formed by multiple aspects. (Nutt 2015)

4.1 Balancing with animation frames

Move's speed equals its animation which is not just a visual indication. It contains information which is valuable for understanding and mastering the game. The animation can be split into frames, which then can be separated into three categories: startup, active frames and recovery. Generally shorter the section, the better. The startup is the period before the move hits anything. During active frames the moves hitbox is out, meaning it can hit the opponent. With active frames sometimes it can be beneficial if it last longer, for example, anti-air moves. Recovery is the period it takes for the character to return to neutral position. Moves can be balanced by adding or removing frames from each category. For example, in figure 8 we can see the character do a heavy kick which last 32 frames. The same character has a light punch which last 12 frames. Because the punch is half as fast, it can be used more safely and to interrupt slower moves.
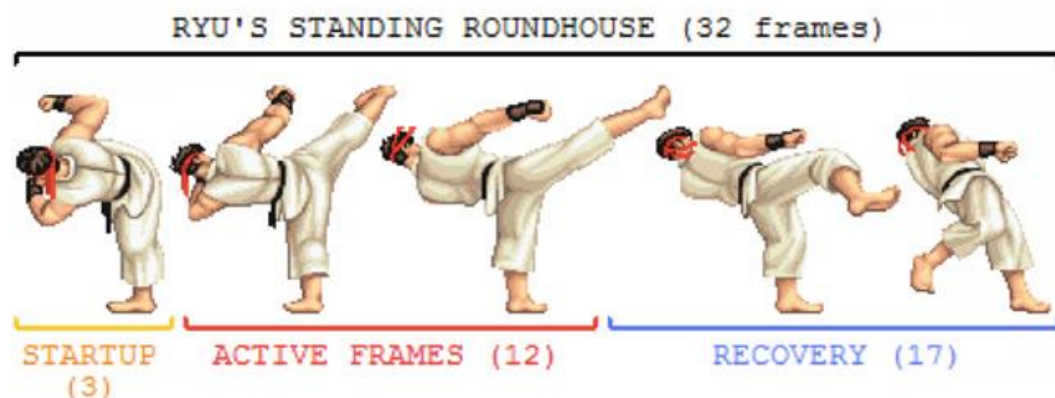
Figure 8: Street Fighter II (1991) (Miller 2014)

It is also easier to react to these slower moves. Veteran players can easily react to these moves if they are used without thinking. Though they are useful in end of combos. (Miller 2014)

4.2 Balancing with inputs

Moves can also be balanced by putting them behind inputs. Inputs are motions that player has to perform in order for the move to come out. This leads to situations where it is harder to do the move and you can fail to do it. More complicated the input is, more powerful the move can be. The most common inputs are half-circle forward and z-motion (figure 9). Only special or super moves have inputs because of their effectiveness and properties.

Figure 9: Ultimate Marvel vs Capcom 3 (2011), character Ryu's moves.

There are multiple different inputs. They differ from each other in length and difficulty. In figure 10 you can see all the different single inputs. Combining these you can create many alterations. (Miller 2014)

Figure 10: (Hinata-Kurisu. 2012)

Even similar moves can have different inputs. For example, in figure 11 we can see both the characters using fireball move. They may look similar but the other significantly shorter animation. However, the move's input is much harder and takes it longer to perform. This way, even similar moves can have different purposes. In this case, the harder move is meant to be used defensively. (Miller 2014)

Figure 11: Street Fighter IV (2009)

4.3 Balancing with meters

Moves can also be balanced by attaching them to meters. Using the move requires player to spend a certain amount of meter. Most common is the super meter which can be found in almost every 2D fighting game. Players have limited amount of meter in use. This way players have to think when to use it as they lose it for every try. Meter moves (figure 12) are better than normal moves and activate faster. They can do more damage or they may have superior frame data. Correctly used meter move can determine or turn over a match. It is important to spend a good amount of time balancing meter moves and to take into account how much meter players has during matches. (Miller 2014)

Figure 12: Ultimate Marvel vs Capcom 3 (2011)

5 CREATING MY OWN GAME

As an avid fan of 2D fighting games, I have always wanted to create one myself. Having played different types of fighting games, I have experienced many good and bad ones. With that knowledge, I want to create a game that benefits the fighting game community and gives something new to the players.

5.1 Goal

Fighting games are a very niche genre that challenges the player and forces them to admit their own failings. Because of this high entry barrier, fighting game community is quite small and there are not that many new players. What forms this entry barrier is that player has to take in lots of information right from the beginning, not many mechanics are properly explained and they lack basic knowledge of how to play. Where this leads to is button mashing, frustration and eventually to drop of interest. I want to tackle that problem by creating a fighting game that teaches basic fighting game knowledges for new players and helps them move to other fighting games. Usually, new players do not understand differences between character archetypes, varying match situations or how to use their character's tools. While this may not appeal to veteran players, game like this would benefit the fighting game community by bringing in new players.

While there has been fighting games that try to tackle the problem by simplifying the gameplay, teachings from them may not translate into other games. This way the contact into the world of fighting games is very shallow and will not improve new players. Usually, they also do not try to teach basic knowledge which would improve the experience.

5.2 Creating a fighting game system

I started designing my fighting game by determining the factors I wanted to focus. What would the gameplay focus, what type of learning process players would have to go through and what would be the depth of the gameplay?

I decided that the game would be played with one character. The reason for this is that it is simpler to learn, players do not have to focus on so many details when playing. Overall it makes the learning process much simpler and streamlined.

The game would use six button layout, three punches and three kicks. I chose six button layout over four because it allows attaching specific functions, for example, anti-air attack, to certain button more easily so that they do not overlap. Both punches and kicks would have three different strength level: light, medium, heavy. Each tier would have different benefits and weaknesses. Light attacks are fast but weak moves that can catch the opponent's moves. Heavy attacks are powerful but slow moves. They do a huge amount of damage but they are easy to punish. Medium attacks are between these two other types. They will have long reach so they are good poke moves. Every moves animation and hit area would change when character is crouching or jumping.

I wanted basic gameplay mechanics to be easy to learn and universal between characters. Every character would have their basic tools under same buttons. For example, every character would have their anti-air attack under heavy punch. This way players have an immediate idea how to use each character without learning basic tools again. While the moves frame data can differ they would all have the same purpose.

Combos would work similarly. Every character can combo their moves by going from light to medium to heavy. This would give characters simple target combos

and they are easy to understand. Target combos could also be ended with character's special or super move. One way to do easy combos is to put the whole combo behind one button. Rapidly pressing one button will create a combo. While this can be easy to do and simple to learn, it does not teach players to get better in knowing the mechanics.

Also, super moves inputs would be universal. Every character will have three super moves which are performed same with every character, you can see them in figure 13. Characters will have two weaker super moves that can be performed more often and one high damaging attack that will use lots of resources. During rounds, players can spend super meter to perform super moves. Super meter is collected by attacking and taking damage. Players can have a maximum of five-meter bars collected.

Level 1 super   ⇓ ⬊ ⟹ ➕ 2 punch buttons

Level 1 super   ⇓ ⬊ ⟹ ➕ 2 kick buttons

Level 3 super   ⇓ ⬈ ⟸ ➕ 2 punch buttons
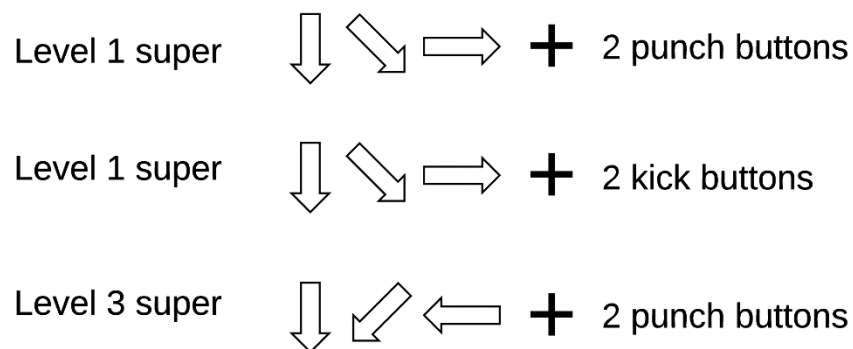
Figure 13: Characters super moves inputs.

Players will play best of three match. To win a match, a player has to win two, 99 seconds rounds. A round can be won by either reducing the opponent's health to zero or having more health in the end. During rounds, players get several different types of information. The most important factor in the UI is to convey the information to the player as simple as possible (figure 14). They have several bars they have to look during rounds. Health bar shows both characters current health. Next to the health bar, players can see their character's portrait which helps them to see their own information. Below the health bar, players can see how many rounds they have won and it is indicated with v icon. Super bar, which is located in the bottom of the screen, informs how much super bar they have. They can also see their total amount next to it. Clock, which is in the middle, shows how much

time is left in the round. This way players can decided how aggressive they have to be to win the round.

	Player 1's health	99	Player 2's health	
Character icon		V		Character icon
		Clock		

Total amount of player's super bars

| 3 | Player 1's super meter | | Player 2's super meter | 1 |

Figure 14: Basic user interface during the match.

5.3 Designing the character roster

Because the same character archetypes appear in almost every fighting game I want to introduce them to the player with simple versions of them. I decided to focus on six archetypes that appear same way most of the time. These archetypes are shoto, rushdown, glass cannon, grappler, zoner and charge. Simplifying puppet character and trickster found out to be more difficult than I though. They came out as too simplified versions so they did not fulfill their purpose. While every character represents their own archetype through their move set, to ease the learning process I reduced their differences otherwise. Every character will have the same basic attributes: an equal amount of health, same movement speed and similar meter gain. Originally I also thought of giving every character four special moves but I reduced the amount to three. The reason for this was to focus on the archetype's strengths and uniqueness. Adding the fourth move made them cross up too much with each other. Character's special moves are performed by doing

certain motion and pressing either punch or kick. Depending on the strength level of the punch or kick, the special moves attributes changes.

The first character to be designed was the game's shoto character. Because of just using three special moves, the character's move set was pretty much determined (figure 15). The character would need a reliable projectile and anti-air moves. The projectile would give the character a tool to poke from a safe distance while the anti-air could be used to punish jump in opportunities. To avoid creating overpowered moves these should have long recovery time which could be punished if the moves are blocked. For the third move, I wanted to give the character a cap closer that would help in positioning. A low-profile slide attack suits perfectly for this purpose. Because low-profile would allow the character to avoid certain moves, the slide has to have long recovery time. If it would be blocked or it misses, the opponent would have a good opportunity to punish it. The shoto character's strength would be his wide toolset, which would give him an answer to almost any situation while not exceeding in any of them.

Projectile	↓ ↘ →	+	Punch
Uppercut	→ ↓ ↘	+	Punch
Lunge	↓ ↙ ←	+	Kick
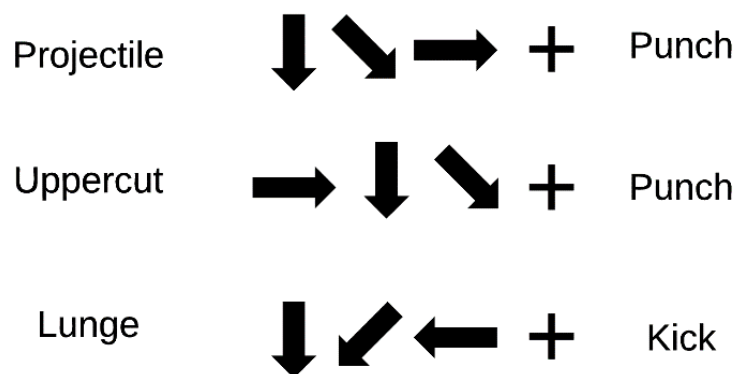
Figure 15: Shoto character's special moves inputs.

Next character that I designed was the zoner. Because of their nature, zoner would need multiple projectiles that could be used control the field. The most basic tool the character would need is a fast, straight moving projectile. The projectile A would be a good tool to poke the opponent and to create pressure but to offset the speed, it would have a weak damage. To allow the character to control the field better, she would need an anti-air. To avoid the similarities with shoto character, this anti-air would be a projectile B that rises diagonally into the air. These two

projectiles should have almost an identical startup, forcing the opponent to be careful with their movement.

Projectile C's different launch angles

C   C   C

Character

Projectile A   A

B   B   B

Projectile B's different attack points
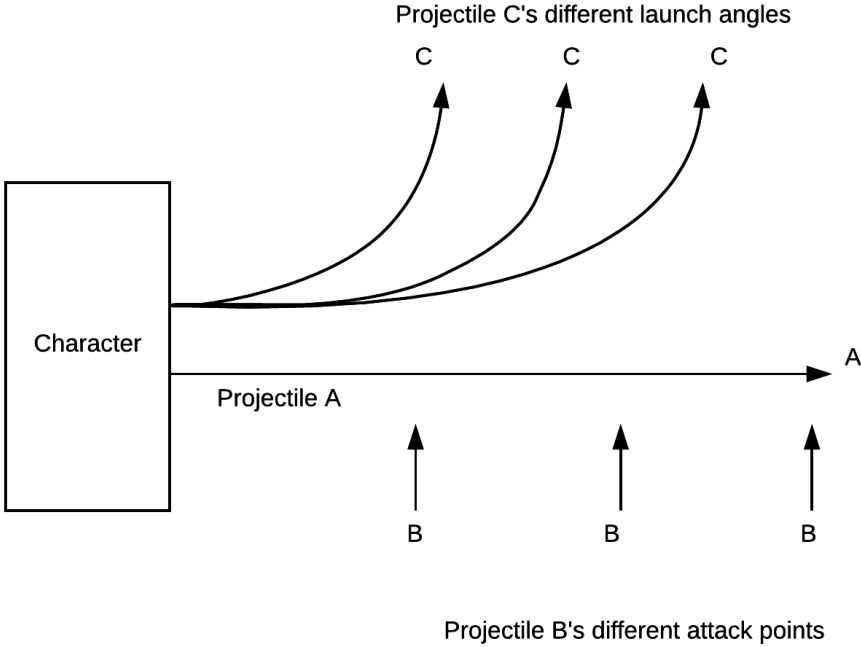
Figure 16: Zoner character's projectile movements

The character would also need a move to create mix-up situations. The mix-up is a situation where the player tries to make his next move as unpredictable as possible. It is needed so that the character can try to pry open the opponent from defensive position. Low hitting projectile C would force the other player to react by either jumping or blocking low. In either situation it would give the zoner upper hand allowing more pressure. To balance it the projectile would have to distinguishable from the other two, as it work differently and it should be easily avoidable. For this purpose, the projectile would travel on the ground. To make it a pressure tool the projectile would explode when it hits forcing the opponent to block longer. In figure 16 you can see the all the different ways zoner's projectiles can fly. Lightest attack has the shortest range and vice versa. Zoner's inputs are similar to shoto's (figure 17).

Projectile A ⬇ ↘ ➡ + Punch

Projectile B ➡ ⬇ ↘ + Punch

Projectile C ⬇ ↘ ➡ + Kick

Figure 17: Zoner character's special moves inputs.

Usually, grappler characters are infamous for their huge damage output and difficult inputs. While both of those are core aspects of the archetype, I wanted to steer away from that direction. The reason for this was that it is difficult for new players to grasp this type of characters. Instead, I focused on easing the entry barrier (figure 18) so that players get the idea of how to play grappl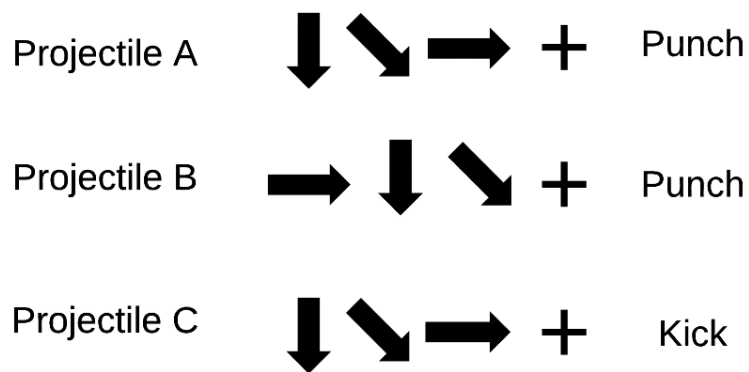ers. Grappler character also gets the most benefit of the universal attributes as they usually are really slow. To compensate this the overall damage of the throws has to be lower. The first move that was designed was the grappler's basic command throw. Compared to normal throw, command throw has to be performed with input. Usually, these moves are done with full circle motion, which is difficult to do as it has to be done after other moves. So the first thing was to get rid of that and instead give it a move simpler input. The move itself is a close range throw with long recovery time so missing with is punishable. If the move connects it will leave the player in advantaged position. Also, the direction of the throw cannot be controlled so that players also have to use their basic throw. I also wanted to give the grappler an anti-air throw. This move will only connect if the opponent is in the air. Compared to the previous throw, the anti-air throw will create more distance between the grappler and the opponent. This would reinforce the grappler playstyle and make the move feel different from other anti-air specials. Because the grappler only has situational command throws, the character would need move to advance forward. For this purpose the character gets a forward going tackle move with hyper armor. Hyper armor makes the attack uninterruptable for a certain

while. The player can use this tackle to punish unsafe moves from close range. The hyper armor even allows players to make risky plays.

Command throw → ↘ ↓ ↙ ← + Punch

Anti-air throw → ↓ ↘ + Punch

Hyper armor lunge ↓ ↘ → + Kick
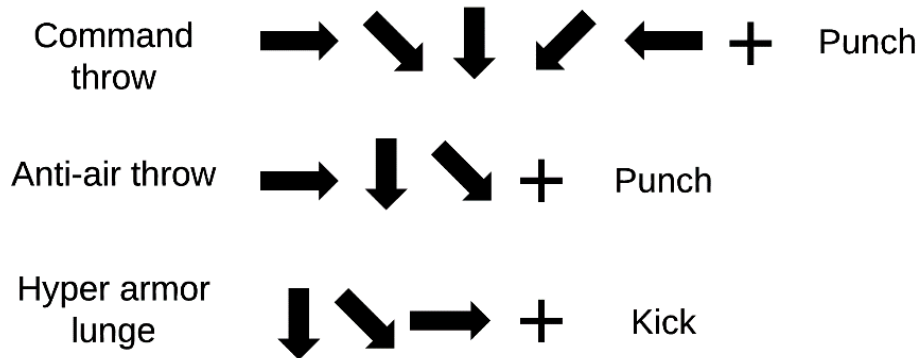
Figure 18: Grappler character's special moves inputs.

Next, I wanted to create the game's rushdown character. For a rushdown character to work, he will need necessary tools to pressure the opponent in close combat situations (figure 19). The move set should allow the player to create unexpected situations where the opponent cannot react in time. Good pressure tool is the rekka move which is an attack that can be performed multiple times by repeating its own input. It will allow the player to use multiple moves in fast interval forcing the opponent to block. To make it easier to use, the player has to perform the move's input only one time and after that pushing attack button is enough.

Rekka attack ↓ ↘ → + Punch * 3

Dash ↓ ↘ → + Kick

Overhead ↓ ↙ ← + Kick
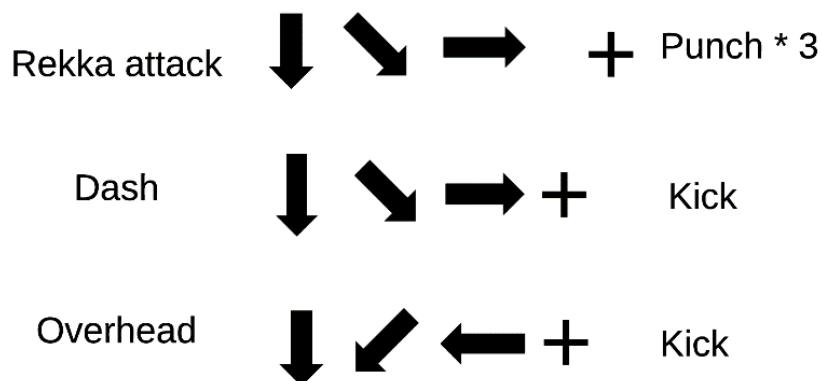
Figure 19: Rushdown character's special moves inputs.

The rushdown character would also benefit from overhead special attack. This would give the player the option to get his opponent's defense. Because rushdown character positioning is very important for their playstyle, the character would need an attack to move around the field. Dash attack, which direction player could

control, would give the character extra movement option. It could also be used to punish the opponents trying to run away.

Glass cannon's playstyle is similar to rushdown and their move sets can be similar. The biggest difference is however the speed which changes it drastically. Glass cannon's moves usually support hit and run style of play compared to rushdown. With this in mind, I wanted to give her tools to get close and something to poke with (figure 20). The first move that I designed was quick dash attack which could be used to close the gap easily. Normally this move would be a straight line forward but in the air, the move would change trajectory into downward diagonal going dash. The move could be then be used to pressure the opponent from different direction. I also wanted to give the character a mix-up tool. To different the character from rushdown, I wanted to give the character a low hitting command grab. This move could also be used to reset the situation into neutral. For poking purposes, I wanted to give the glass cannon a projectile. The projectile would be fast and weak attack similar to the zoner's basic projectile. Unlike with the zoner, the projectile would go in downward. This way it could not be used while the opponent is far away and instead it would be a tool to get in. The move could also be used in the air, which would give the glass cannon good tools in the ground and air.

Projectile ↓ ↘ ➡ + Punch

Dash ↓ ↘ ➡ + Kick

Command throw ➡ ↘ ↓ ↙ ⬅ + Kick
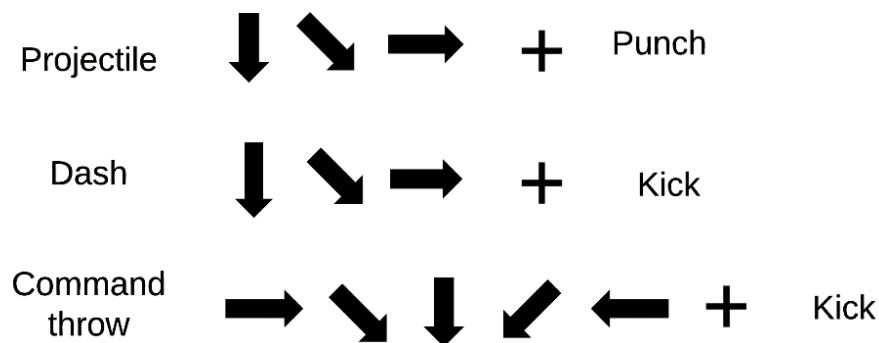
Figure 20: Glass cannon character's special moves inputs.

Usually, charge characters have more defensive playstyle, I wanted to design more aggressive one. To do this the character would need moves that allow aggressive playstyle. While this can be difficult to do with charge motions (figure 21), it would a allow creation of interesting moves. The character would have two backward chargeable moves to help in getting closer and one downward chargeable move as a combo filler. The two backward chargeable moves would be a projectile and a tackle. The tackle would be fast moving attack that could be used to punish the opponent's mistakes. The projectile would be slow moving attack that the player could use a temporary shield. This would happen so that the players send out the projectile and dashes behind it. I did not want to make the downward chargeable move an anti-air as it would favor a more defensive style. Instead it would be arc like jumping attack. This could be used as combo filler and a way to jump over the opponent's projectiles.

Projectile   ⬅ Hold,   ➡ + Punch

Tackle   ⬅ Hold,   ➡ + Kick

Jumping attack   ⬇ Hold,   ⬆ + Kick

Figure 21: Charge character's special moves inputs.

5.4 Analysis

After getting to the point where the initial basic design was decided, it was time to analyze the progress and see where I had gotten. I wanted to see if the design matched the initial goal.

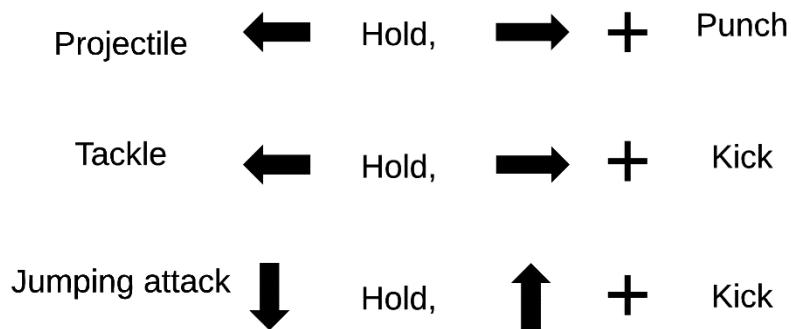Because of my knowledge from multiple different fighting games, the initial idea for the game was pretty clear. While the initial design started out pretty well, I soon noticed the lack of actual prototype slowed down the design progress. It would have been beneficial to try out the mechanics and small details, such as frame data, in a prototype. Also, it prevents trying out the flow of the movement and attacks. Another problem that rose up during the progress was the need of an artist. Especially in the character design, an artist would have helped in designing the move set of the characters. Because of this, it came out as very shallow.

I think I got into good start was the compression of different mechanics and characters in fighting games. The characters represented the core playstyle of their archetypes even when they were simplified versions. Also, making the gameplay and basic attacks be same for every character, made the game easy to remember and to learn, while still keeping complexity and similarity with other fighting games.

The next step would be to start the prototyping to get feel and flow of the gameplay right. Also, it would be necessary to draw out all the initial moves of the characters and to create basic models for them. After that, it would iteration of the design and adding the missing archetypes into the game.

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Miller, Patrick. (2014) From Masher to Master: The Educated Video Game
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Figure 4: Ultimate Marvel vs Capcom 3 (2011), in-game screenshot

Figure 5: Guilty Gear Xrd (2015), in-game screenshot

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Figure 8: Miller, Patrick. (2014) From Masher to Master: The Educated Video Game Enthusiast's Fighting Game Primer

Figure 9: Ultimate Marvel vs Capcom 3 (2011)
http://www.marvelvscapcom3.com/us/characters/ryu

Figure 10: (Hinata-Kurisu. 2012)
http://hinata-kurisu.deviantart.com/art/Fighting-game-inputs-311620526

Figure 11: Street Fighter IV (2009), in-game screenshot

Figure 12: Ultimate Marvel vs Capcom 3 (2011), in-game screenshot

ANNEX

Game Design Document 2D Fighting game for beginners

Game Design

Summary

The game's that introduces 2D fighting games as a concept for new players. The game would be stepping board for other fighting games.
Gameplay

The game is a six buttons 2D fighter, mixing elements from Street Fighter and Guilty Gear. Biggest influences are Skullgirls and Super Smash Bros because of their simplicity and easy to learn gameplay. The gameplay should be simple enough so that players are comfortable in starting the game and trying out different characters. Compare this to Smash's directional special moves. Every direction has same purpose, making them easy to remember. The game should also be easy enough to learn in basic level. This could be done by simplifying the special move and combo systems. Minimizing the differences between characters should be main goal. Although every character should represent fighting game archetype, e.x. shoto. Idea behind this is that players get to learn most used playstyles and they can easily approach them.

Mindset

Players should have a mindset that they can learn when playing the game. Starting to learn fighters can be difficult process as most of the games don't teach

basic situations for the players. To give the player the right mindset, the game's tutorial has to be wide. The tutorial should go through the basic gameplay, such as how to do combos, and what to do in different situations, e.x what to do when opponent tries to jump attack you.

Technical

Controls

Basic attacks

- Light punch (l.p)
    - Weak
    - Fast
    - Short range
    - Reason: combo starter, easy to punish slow moves
    - Jumping version: hits right in front of the player
- Light kick (l.k)
    - Weak
    - Little slower than l.p
    - Slightly longer range than l.p
    - Reason: combo starter
    - Jumping version: hits down diagonal direction
- Medium punch (m.p)
    - Average damage
    - Average speed
    - Average range
    - Reason: combo extender
    - Jumping version: hits upwards diagonal
- Medium kick (m.k)
    - Average damage
    - Average speed

- o Long range
- o Reason: poking tool
- o Jumping version: hits constantly downwards, can be used as a cross up
- Heavy punch (h.p)
  - o High damage
  - o Slow speed
  - o Medium range
  - o Reason: Poking tool, combo extender, crouching version is a anti-air
  - o Jumping version: hits downward, good way to start combo
- Heavy kick (h.k)
  - o High damage
  - o Slower speed than h.p
  - o Long range
  - o Reason: punishing move, combo extender
  - o Jumping version: hits downward, good way to start combo, slightly longer distance than jumping h.p but also slower.

Movement options

- Side arrows/buttons: Left and right movement
- Up arrow/button: Jump
- 2x Up arrow/button: After initial jump, pressing the input again makes the character do double jump
- Down arrow/button: Crouch
  - o Crouch is a state which lowers the character's hitbox and strike area
- 2x Side arrow/button forward: Pressing two times side button forwards, makes the character dash forward
- 2x Side arrow/button backwards: Pressing two times side button backwards, makes the character do a short dash backwards
- In the air, 2x side arrow: Air dash forward or backward
- Holding side arrow/button backward: Character enters into block state. Every attack, expect low attacks and throws, are blocked

- Holding side arrow/button back and down: Character enters into crouch block state. Every attack, expect high attacks and throws, are blocked

Mechanics

Universal mechanics:

Every character will have these and they can be found under the same button. This way moving to another character is easier as players has basic knowledge what buttons does what.

- Anti-air (crouching.h.p)
  - Move to counter jumping opponents
- Knockdown sweep (crouching.h.k)
  - Low attack that will knock opponent into the ground
  - Very punishable if blocked
- Cross-up (jumping.m.k)
  - Jumping attack that hits both sides of the character.
- Throw (l.p + l.k)
  - Attack where character will grab the opponent and throw them
  - Ignores block
  - Direction of the throw can be controlled
  - Long recovery time
- Overhead (m.p + m.k)
  - Attack that hits high
  - Allows player to get through opponent's crouching block

Combos:

- Every character will have easy to remember and simple target combos.
  - Move can be linked by going from weak to powerful
    - Light > Medium > Heavy
    - After the three basic attacks, combo can be extended either with special or super move.

Super moves:

To ease the learning progress every character will have three super moves. Each of these moves will have the same inputs between each other and they have similar purposes. Characters will have two weaker super moves. We will call them Level 1 supers as they will consume one super meter bar to perform. Each character will also have one Level 3 super move that consumes three super meter bars to perform.

- Level 1: Quarter circle forward + two punch buttons
  - Super attack that can be used in the end of combo.
  - Either projectile or charge attack
- Level 1: Quarter circle forward + two kick buttons
  - Super move that can be used to punish unsafe moves and attacks.
- Level 3: Quarter circle backwards + two punch buttons.
  - Powerful move that has to be planned

Match rules

Basic rules:

- Best of 3
- Every round last 99 seconds
  - Round can be won by either
    - reducing opponent's health to zero
    - having more health than the opponent when the time runs out
- Each character starts with one super meter
- Maximum amount of super meters player can hold is 3

Character Design

"Shoto"
- Character's purpose is to give the player a simple character that has all the necessary tools.
- Example: Ky Kiske, Narukami Yu, Ryu
- Amount of health: Average

- Strengths: good tools, the answer to all situations
- Weakness: not particularly good at anything
- Special moves:
  - Projectile (quarter circle forward + punch)
    - Poking
    - Keeping the distance
  - Rising uppercut (z input forward + punch)
    - Anti-air attack
    - Fast attack that has priority
  - Lunge attack (quarter circle forward + kick)
    - Shortening the distance
    - Combo ender

"Zoner"
- Character's playstyle is to keep your opponent at bay with various long-distance movements
- Example: Dizzy, Lambda, Yukiko Amagi
- Amount of health: Low
- Strengths: Able to keep away the opponent and do damage safely from distance
- Weakness: Weak at short distance, dies quickly if an opponent gets close
- Special moves:
  - Projectile (quarter circle forward + punch)
    - Poking
    - Keeping the distance
    - Weak, more meant to be control tool
  - Pillar projectile (quarter circle forward + kick)
    - Projectile that appears from the ground
    - Poking
    - To annoy opponent
  - Upward moving projectile (z input forward + punch)
    - Anti-air
    - Catching opponent's jumps

- controlling air

"Grappler"

- Character's playstyle is to get close to the opponent to do damaging throws
- Example: Potemkin, Kanji Tatsumi, Cerebella
- Amount of health: High
- Strengths: Voimakkaita yksittäisiä liikkeitä, osassa liikkeissä on hyper armor
- Weakness: Hidas, huonot liikkumis ominaisuudet
- Special moves:
    o Short distance throw (half circle backward + punch)
        - Command throw
        - Short distance
    o Anti-air throw (z input forward + punch)
        - Throw that catches opponents from the air
        - Doesn't work if opponent is in the ground
    o Hyper armor lunge (quarter circle forward + kick)
        - Hyper armor
            - Can go through opponent's attacks
        - Shortening the distance

"Rushdown"

- Playstyle is to be close to the opponent all the time to pressure them
- Example: Slayer, Valkenhayn R. Hellsing, Ms.Fortune
- Amount of health: High
- Strengths: If a character gets on your skin, and the player gets the momentum going, character is hard to stop
- Weakness: No long distance attacks, need to be close to work, poor defense options
- Special moves:
    o Rekka (quarter circle forward + punch x3)
        - Can be repeabted 3 times
            - After first, pressing punch or kick button is enough
        - Combo filler

- ▪ Block string
  - o Fast lunge (quarter circle forward + kick)
    - ▪ Shortening the distance
    - ▪ Movement option
  - o Overhead kick (quarter circle backward + kick)
    - ▪ Mix-up tool
    - ▪ Can be used to punish unsafe moves

"Glass Cannon"

- Playstyle is to move around the field and to create mix-up situations
- Example: Chipp Zanuff, Millia Rage, Yosuke Hanamura
- Amount of health: Low
- Strengths: Fast movements, it can be difficult to keep up with the character
- Weakness: Must be close to work, dies easily, no room for mistakes
- Special moves:
  - o Fast lunge (quarter circle forward + kick)
    - ▪ Goes through the opponent
    - ▪ Fast active frames
    - ▪ Becomes divekick in the air
  - o Command throw lunge (half circle backward + punch)
    - ▪ Risky
    - ▪ Long recovery time
    - ▪ Travels short distance
  - o Projectile (quarter circle forward + punch)
    - ▪ Fast
    - ▪ Weak
    - ▪ Travels in downward angle
    - ▪ Great poking tool
    - ▪ Can also be used in the air

"Charge"

- Character with moves that have good frame data
- Example: Parasoul, Mitsuru Kirijo, Leona Heidern
- Amount of health: Average
- Strengths: Special moves have good frame data, many good poking moves

- Weakness: Chargeable moves can be hard to combo, because moves require charging they have to planned before hand
- Special moves:
    - Lunge tackle (charge backward + kick)
        - Pushes opponent backward
        - Can be used to punish unsafe moves and mistakes
        - Short activation and recovery time
        - Combo finisher
    - Projectile (charge backward + punch)
        - Fast projectile
        - Short activation and recovery time
        - Riskless to do even in short distance
    - Jump attack (charge downward + kick)
        - Goes over projectiles and low hitting moves
        - Can be used to punish unsafe moves and mistakes
        - Combo finisher
        - Allows closing the distance between opponent and character quickly