Momentanium

### Exploring Platformer Fighting Game Mechanics

### Final Year Games Programming Project Proposal

### Thomas Knight (V8052473) Computer Games Programming

##### **Project Description**

The aim of this project is to explore the various mechanics found in platformer fighting games and use them to create my own fighting game that people can play. Furthermore, I plan to implement new mechanics, including movement being more momentum based and a unique health system, and use playtesting to explore how they affect the user experience of my fighting game.

The project will be programmed in *GameMaker Studio 2* using GML, as it contains tools that are very useful for developing 2D video games, and is an engine that I am comfortable working with due to my previous experiences with it.

##### **Rationale for project choice**

There are a few reasons as to why I went for this project. Firstly, platformer fighting games is a genre that I have a large interest in, having played *Super Smash Brothers Brawl*, *Super Smash Brothers Ultimate*, and *Brawlhalla*. Therefore, I feel confident in my current understanding of the base structure of fighting games to be able to develop my own fighting game, as well as explore the more complex mechanics of the genre.

Secondly, artificial intelligence programming is an area that I am interested in, and from my current understanding I know that fighting game AI is relatively complex, so this project will allow me to research into this area and possibly create my own AI for the fighting game.

Finally, platformer fighting games are often 2D or 2.5D, and I have experience with creating pixel art for various other projects I take part in. Therefore, developing a 2D fighting game would mean I could create my own assets, which will in turn prevent any possible legal issues that would have arisen if I were to use assets made by other people.

##### **Areas for investigation**

There are 3 main focuses that this project will investigate to help develop a good understanding of how fighting games are developed.

*Developing the Structure of a Platformer Fighting Game*

This includes various mechanics that fighting games are based on, such as the moveset, movement and health of a player. This is necessary to be able to implement new mechanics and properly test them, and it will also include a game loop to allow for proper playtesting.

*Implementing and Testing Unique Game Mechanics*

This is to experiment with the mechanics commonly found in the fighting game genre and see how changing them impacts the user experience of the game, as I believe it will help me develop a better understanding of these mechanics and their purpose.

*Developing a Platformer Fighting Game AI*

This is to both develop my understanding of AI and my understanding of how players use the mechanics a fighting game provides. This will also prove to be helpful for playtesting, as those who cannot play against others in local multiplayer will be able to test the game by fighting the AI.

##### **Background research for proposal**

A majority of my background research is currently based on my past experiences with both programming platformer physics and researching into the mechanics behind platformer fighting games I play. I know enough to be able to break down the individual mechanics and try to reprogram them into the artefact.

To further help me I have done some extra research and found a PDF called *Designing a 2D Fighting Game[[1]](#footnote-1)*, which delves into the design of popular fighting games. This PDF could help me understand my own fighting game’s design, and help me make decisions on how to improve it.

An area I lack understanding in is artificial intelligence. Fortunately, my other module for this semester is about AI, so it may provide techniques that I could find helpful in this project. Furthermore, I have found a research paper that delves into fighting game AI, called *Creating AI Characters for Fighting Games using Genetic Programming[[2]](#footnote-2)*. I will find this paper helpful later in the project when I try developing my own AI for the game.

##### **Methodology for development and/or research**

*Development Methodology*

From my initial research and previous experience with fighting games, I know that they are made up of a lot of small mechanics connected to each other, so I need to make sure that the artefact I develop is well structured, otherwise I may run into issues with bugs and implementing mechanics that will impact the play testing later on. Furthermore, I need something that will allow me to implement and test new features without impacting my workflow. Therefore, I have decided to be using the scrim method to manage this project, as it has the flexibility to allow me to easily implement new features, then test and review them, while also letting me plan out the project in a structured way.

To help manage my project I will be using *Hack’n’Plan* for scrim management, and *GitHub* for source control, as they will allow me to control the pace of the project and allow me to access it on any PC, as long as I have the required software to work on it.

*Collecting Data*

Later in the project I will need to have people playtest the game to test the mechanics implemented and see if they work properly. Furthermore, I will need to use this playtesting to see how new mechanics and changes to common mechanics impact the gameplay and user experience. I plan to collect playtesting data by having the user complete a *Google form* after playing the game, which will contain questions relating to their experience with the game and past experiences they have with fighting games.

##### **research ethics and legal issues**

There are few ethical issues with this project, as the only participants that may be involved would be play testers, who will have to provide me with data relating to the project. However, I plan to make sure that the methods used to submit this data is anonymous and non-sensitive.

There will be no legal issues, as I plan to make the contents of this project by myself, and do not plan to use external assets. I currently plan for this to be a non-commercial game, but if I do release it as a commercial game, I own licenses for all the software I plan to use in this project (*GameMaker Studio 2, Aseprite, FLStudio*), so there should not be any legal issues.

##### **project plan**

Below is a table of each area I will be focusing on for this project, as well as how long it should take to get the quality of work in these areas up to a good standard. I plan to be spending around 2 - 4 hours a day working on this project, which should provide 14 – 28 hours of work each week while still giving me time to manage my other modules and have time for food, sleep, socialising and hobbies.

|  |  |
| --- | --- |
| **Milestone** | **Start Date – End Date** |
| **Project Proposal** | **25th Jan – 2nd Feb** |
| Basic Movement and Physics | 2nd Feb – 8th Feb |
| Health and Attack Structure | 8th Feb – 15th Feb |
| Design and Implement Basic Attacks | 15th Feb – 22nd Feb |
| Local Multiplayer System | 22nd Feb – 1st Mar |
| Basic Gameplay Loop | 1st Mar – 5th Mar |
| Design and Implement more Attacks | If ahead of schedule |
| **Progress Review Presentation** | **5th Mar – 8th Mar** |
| 1st Round of Public Playtesting and Survey | 8th Mar – 13th Mar |
| Review Survey Data and Make Changes | 13th Mar – 15th Mar |
| Implement at least 3 new mechanics | 15th Mar – 22nd Mar |
| 2nd Round of Public Playtesting and Survey | 22nd Mar – 27th Mar |
| Review Survey Data and Make Changes | 27th Mar – 29th Mar |
| Create and Implement Attacks using New Mechanics | 29th Mar – 5th Apr |
| Research and Develop Fighting game AI | 5th Apr – 26th Apr |
| Final Round of Public Playtesting and Survey | 26th Apr – 1st May |
| Review Survey Date and Final Refinements | 1st May – 4th May |
| **Artefact Hand-in** | **4th May** |
| **Report Hand-in** | **5th May – 11th May** |

##### **Proposed project artefact**

The proposed artefact this project will produce is a video game within the genre of platformer fighting games, where people will be able to play against each other in local play by fighting with their chosen characters using mechanics typically found in this genre, as well as new mechanics that have been thoroughly play tested. People will also be able to play against an artificial intelligence that will control one of the characters.

1. Ketonen, Miikka. Designing a 2D fighting game. 1st Edition. [PDF] Available at: https://www.theseus.fi/bitstream/handle/10024/118514/Thesis\_Miikka\_Ketonen\_KAT13PT.pdf?sequence=1&isAllowed=y [Accessed 2 Feb. 2021] [↑](#footnote-ref-1)
2. Mart´ınez-Arellano, G., Cant, R. and Woods, D. (2017) Creating AI Characters for Fighting Games using Genetic Programming. 1st Edition. [PDF] Available at: https://core.ac.uk/download/pdf/74208089.pdf [Accessed 2 Feb. 2021] [↑](#footnote-ref-2)