



Mila's Story

Table of Contents

1	Introduction	Pg. 2
1.1	Scope	
2	Reference Games	Pg. 2
3	Target System	Pg.3
3.1	IOS/Android	
4	Development System	Pg.3
4.1	Software	
5	Specification	Pg.3
5.1	Concept	
5.1.1	Design Process	
5.2	Story	
5.2.1	Setting	
5.3	Game Structure	
5.4	Players	
5.5	Action	
5.6	Objective	
5.7	Graphics	
5.7.1	Landscape	
5.7.1.1	Detail	
5.7.1.2	Objects/Pickups/Obstacles	
6	Gameplay	Pg. 7
7	Front End	Pg. 7
7.1	Intro	
7.2	Menus	
8	Development	Pg. 8
9	Team	Pg. 8
10	Time	Pg. 8
11	Design Logs	Pg. 9

1. Introduction

This document hold the blueprint information needed to build a refresh of an 1980's retro arcade bullet hell game. The environment specifically related to Glasgow Caledonian University. Everything this document demonstrates has been discussed in meetings held since the 29. January. 2018 with members, Connor Goodman, Dávid Ladomerszky, Jan Riebe, Rishi Oberoi, Rosa Ahtiainen, Ruben Di Giulio and Stephen Cartner.

1.1 Scope

This document is to be read by artists, designers and programmers involved in the production of the bullet hell game. As well as professors and lecturers of the Glasgow Caledonian University which take the role of a potential stakeholder.

2. Reference Games

Space Asteroids

Stone Horizon

Missile Control

Super Mario Bros

SBoy World Adventure

Paperboy

Renewed Version (Paperboy Infinite Bicycle Ride)

Temple Run 2

3. Target System

Mila's story will be produced for the following platforms: IOS and Android. Both platforms favour the same control scheme, there for this document will not be primarily concerned with one or the other.

3.1 IOS/ANDROID

Both devices with operating systems IOS and Android will need a minimal amount of 500 MB ram to execute the game and any part of gameplay without stuttering and or fps issues. Lagg will not be an issue as at this point the game is planned to not incorporate any network features.

4. Development System

4.1 Software

The bullet hell game will offer the 2D overhead perspective the unity 5.1.6 engine offers to the developers.

This engine created by Unity Technologies USA. Both the IOS and Android versions of the game will be developed using microsoft visual studios. The primary coding language is c#.

5. Specification

5.1 Concept

This bullet hell game favours a progressive and rewarding gameplay system, allowing players to have an immediate understanding of the game and promoting short yet intense play sessions.

Each level introduces the player to one new mechanic, setting new challenges and keeping the player engaged. This also avoids the need of a text based tutorial which would break the immersion in early levels, while also letting experienced players rush through the first levels and have a proper challenge as soon as possible.

5.1.1 Design Process

The design process began by evaluating the stakeholder constraints and the teams technical expertise. After a deep analysis of the various possibilities the team reached the conclusion that according to the experience and knowledge, the game should be in 2D with a top-down perspective.

During a number of meetings, the whole team actively participated in the design process, proposing ideas and analysing how those ideas could affect the player, playtesting and reviewing archetype games and giving early feedback.

By mutual agreement, the team decided to focus on two main ideas:

1. A top-down infinite runner where the player is a student at GCU and, in order to arrive on time to his/her lessons, he/she has to dodge various kind of obstacles and picking power-ups for better scores.
2. A bullet-hell kind of game where the player is a student at GCU and, while in class, he/she has to avoid distractions (tentative) while also trying to pick up as much knowledge as possible.

After the production of the two early prototypes, the team went on an iterative playtest/feedback session of the main mechanics, refining the core of the games while discussing possible features and assets that would fit into both prototypes: All of that in order to better manage resources. After playtesting both games, the team decided which of the two prototypes would have been developed and decided for prototype 2 since it offered a new experience to the player.

See attached Design logs at the end of the document for further details.

5.2 Story

The story revolves around a university student having to go through various class scenarios, all with an individual theme. At the end the player, playing Mila, will graduate in game represented by a credit card showing the scores achieved in different levels. Resembling a real life graduation card.

5.2.1 Setting

The game takes part in classroom-like structures aiming to emulate the look of actual classrooms found at GCU in the present day world.

5.3 Game Structure

The game is split into multiple levels (Planned 1-5) . Each level will not be build procedurally but instead giving the designer the freedom to place objects with a purpose. Each level will incorporate an authentic look and will have a certain theme revolving around it.

Level 1 is a basic classroom with almost no chairs or obstacles and only few “bullets” hindering the player from progressing through the level.

Level 2 is aimed to be a slippery when wet like level where the player will face many puddles that have been positioned all around the classroom. Puddles make the player slip or hinder their movement.

Level 3 is a maze themed level even harder than the one before as many dead ends lure the player into getting hit by bullets as risking the life for progression is a necessity. Level 4 and 5 are yet to be decided by the design team.

5.4 Players

The IOS and Android version of the game will be playable by everyone that has access to the corresponding application store. The game is a single player game and will not feature more than one player per handheld device.

5.5 Action

The player will be able to move through rows of chairs and *tables* by tapping on the touch display of the phone to dodge bullets for example sheets of “F” (failures) and possible other things flying at them from random spawn point axis outside of the screen. Collecting power ups such as “coffee cups” to boost speed, “jetpacks” to jump, “graduate hat” to gain invincibility for a short time. Random spawn points will be set to make other negative pickups such as alcohol bottles or phones spawn. The player will have to react fast and adjust their line of movement in order to dodge these.

5.6 Objective

The objective will be the same for each player. Collect positive “learning sheets” by running in their line of movement and to progress through the level as fast as possible. The faster the player progresses the higher the score at the end of each level the higher the total number of credits gathered the better their endscreen graduation report will appear.

5.7 Graphics

Ingame graphics will all render in realtime and consist of vector graphics displayed in a 2D rich environment.

5.7.1 Landscape

The landscape will be viewed from above though will generate a 2.5D feeling and not a 2D feeling as the characters and textures are all rich in color depth.

5.7.1.1 Detail

The game will run in 720x520 HD handheld display graphics.

5.7.1.2 Objects/Pickups/Obstacles

Items	Effects
Phone*	Covers entire screen, blocking the sight literally. 4th wall breaker
Alcohol bottles	Randomly switches up player controls.
Student (David)	Randomly spawns acting as an obstacle, blocking the players path.
Good Bullets (Papers)	Increase progression bar by x/25
Energy Drink(s)	Increases speed x3
Coffee Cup(s)	Increases speed x2
Graduate Hat	Makes player invincible for limited amount of time.
Jetpack*	Enables player to jump over obstacles.
Tutor	25% of appearing when almost out of time and progression bar under 50%. Throws out many

	“good bullets
Bad Bullets	Pages of a red “F” (fail) that have to be dodged else progression bar will be reduced. May result in instant death.
Magnet (Blue)	Pulls in good objects from a range.
Magnet (Red)	Reppels bad objects from a range.

*unsure if in final game

6. Gameplay

The main game loop is Dodge - Pick - Dodge until the learning bar is full. Once the learning bar is full, the player gets a grade based on how much time it took to complete the level. Completing the game with full grades will unlock a variety of rewards for the player.

In order to add complexity and randomness, each level has a certain chance of having a random modifier which could either help the player or make the game more challenging, adding another layer of complexity and promoting strategic choices.

7. Front End

7.1 Intro

There will be a pre-drawn/rendered animated introduction to the game.

7.2 Menus

The main menu will consist of five buttons. “Start” “Credits” “Awards” “Quit” “Options” (options represented by a cogwheel)

The ingame pause screen will be called upon a “II” pause button that pauses and opens the options scene + “Give Up” button.

8. Development Tools

The game has been developed on Unity 2017.3 using custom level design tools.

9. Team

Programming	:Connor Goodman
Programming	:Jan Riebe
Programming	:Stephen Cartner
Art	:Dávid Ladomerszky
Art	:Rosa Ahtiainen
Design	:Ruben Di Giulio
Design	:Rishi Oberoi

10. Time

Official Start Date	:	29 January, 2018
Complete Game Design	:	5 February, 2018
Milestone 1 Initial Concept	:	12 February, 2018
Milestone 2 Initial Prototypes	:	19 February, 2018
Milestone 3 Concept Art Bible	:	26 February, 2018
Milestone 4 Interim Iteration	:	5 March. 2018
Milestone 5 Game & Software Design Doc	:	12 March 2018
Milestone 6 Play Test Design	:	19 March, 2018
End of Project Finished Game, Final Artwork	:	26 March, 2018
Game Design Logs, Playtest Reports	:	5 April, 2018

11. Design Logs

Week 1:

- The Team first met
- Discussion about the team's experience
- Discussion about preliminary ideas concerning art, game design and software design
- Archetype games review

During week 1 the team analysed its range of expertise and discussed the very first ideas about the game, according to the stakeholder constraints. The team decided that according to its range of expertise, the game could be a 2d game, either in top-down view or side view, since the whole team had previous experience with 2d game, which would lead to a better final result.

The team then proceeded by brainstorming some general ideas about the main features the game should have, according to the stakeholder constraints. This allowed the whole team to actively participate in the design process.

Finally, the team decided that it would have been beneficial to review some archetype games in order to better understand the stakeholder constraints, the general gameplay mechanics, the art style and the eventual challenges concerning the game code.

Week 2:

- Character design
- Discussion about art unification between two different prototypes
- Early prototype playtest of the “infinite runner” game
- Pitch document and early prototype playtest of “bullet hell” game
- Team cohesion feedback
- Discussion about advanced mechanics of “infinite runner” game
- Early art concepts

In week 2, after analysing some games, the team decided to develop two different early prototype, with different playstyle, so that it would have been possible to experiment with different game mechanics and game styles. The first prototype is a classic infinite runner game where the player has to avoid obstacles and reach an end level goal / accumulate points indefinitely. This was the team’s safe choice: an infinite runner is both the kind of game that better represent the stakeholder’s constraints, and the kind of game that the whole team is used to, so that it would have been easier to shape game mechanics and art style for such a game.

The early concept included the design for some kind of power ups and main game mechanics, along with concepts for different kind of obstacles. The choice of power ups and different kind of obstacles was made in order to offer the player a deeper learning curve and a wider variety of levels while preserving the main features of an 80’s arcade game: immediacy and challenge.

Concerning the second prototype, the team decided to experiment with the general gameplay mechanics. The main idea for the second prototype is the one from a typical bullet hell, but reversed, since this would allow short yet intense play sessions. Instead of avoiding as many bullets as possible while shooting back to an enemy, the player has to catch as many bullets as possible. This choice would maintain the general features and engagement of a typical bullet hell game, while offering the player a new experience.

The first draft for control scheme was a click where you want to move scheme, but this kind of control scheme was soon scrapped, since, during an early playtest, the team found out that in order to use this kind of scheme on a mobile platform the player would have covered most of the screen with his own hand, which is not ideal for a game where it is crucial to always pay attention to the character’s surroundings.

The team decided to use a general 2d top down view for both prototypes: this allowed the unification for both prototypes art styles, saving potential extra workload that would have ultimately not being used.

In week 2 the art team also completed its moodboard for the game: the team felt that, according to the stakeholder constraints, the game should have had a determined colour scheme and a determined style, to better convey a positive image of the characters and location of the game.

Week 3:

- Completely reworked the movement mechanics of “bullet hell” game
- Early consumables and pickups design concepts
- Art concepts for various assets
- Fine tuning and playtest of both prototypes main mechanics
- Discussion about game complexity and difficulty
- Playtest of both prototypes and fine tuning of mechanics

During week three the team carried on further developing the two prototypes. Now that the team has a clear idea of what the two games are, it has been possible to design pickups and obstacles that would have been used in both prototypes anyway, thus saving art and design resources: pickups such as the “coffee cup”, “graduate hat/robe” or “fast food”, static objects such as floors, walls, chairs and desks were present, at a certain point, in both prototypes. The art team developed a first draft of character design, with different styles, and a first draft for the entire look of the game, including menus and level art style. The code could not be shared between the two prototypes, so both of them have been developed independently code-wise.

In week 3 prototype two’s movement mechanic have been reworked in order to offer the player a better experience. The team had to make a one of its kind movement mechanic in order to offer the best movement mechanic for that kind of game: having in mind that the game would have been developed on mobile devices, the team opted for a lane-based, side scrolling movement mechanic: there is a side scrolling bar that would allow the player to move very quickly left and right. If the player wants to change lane (either up or down) has to swipe up or down at the cost of a temporary slow down. With this kind of movement mechanic the player would be able to both completely rely on his/her promptness moving left or right to avoid “bad” bullets while picking up “good” ones, or can make a strategic choice to reposition on another, easier lane.

During week 3 the team further discussed about some early pickups ideas and obstacles, while trying to keep in mind that, at this stage, it would have been better if the art for those could have been used for both prototypes.

The team also playtested fine-tuned versions of both prototypes, and discussed about both of them. The whole team agreed that, at this stage, both prototypes were fun and engaging, but the team also felt that it wasn’t the time to make a definitive choice between the two.

Week 4:

- Picked the prototype the team is going forward with
- Character design
- Character prototypes
- Discussion about character art style
- Discussion about pickups and consumables
- Discussion about advanced game mechanics

After playtesting both prototypes again, the team believed that it was time to decide which prototype would have been the prototype it carried on and which one would have been scrapped. It has been a hard choice since both of the prototypes had their very own pros and cons, but after a long discussion the team decided to carry on developing prototype 2 (reverse bullet hell). The reason behind this choice was that prototype 2 is a one of its kind game with original mechanics and ideas, and the team thought that it would have been beneficial to make something new and never seen before. Considering the camera angle, the assets could have been reused for this prototype, saving resources and development time.

In week four, the team decided which of the many character design would have been the main style, also picking the “hero” design. The team thought that a specific kind of art style would better fit the overall style and theme of the game.

Considering that at this point the team had a clear vision of what the game would look like and how it would work, the team carried on designing and developing early concepts for pickups and consumables. The team thought it would have been beneficial to design pickups around a small amount of variables , thus saving resources and development time while still adding variation. Variables like movement speed and bullets speed can now be accessed by external pickups changing them for a determined amount of time.

The team also discussed advanced game mechanics, which have been identified as additional difficulty and variety layers: the team believed that the best way to add different layers of complexity to the game was to build a solid foundation first and then add layers on top of it, according to a precise plan concerning possible features and main features.

Considering that the first layer (the main mechanics layer) was there, the team decided to move on the second layer of complexity: after brainstorming some ideas, the team agreed that the best way to add some complexity to the game was to add some randomness to it. The team, in fact, opted for a random modifier for each level: this modifier would affect the public variables mentioned above and some visual effects, adding some randomness and complexity.

Week 5:

- UI Discussion
- Animations
- Level Design
- Playtest Session
- Storyline



In week 5 the team focused on the details of the game: the first point of discussion have been the UI. The team agreed that the fewer “clicks” to get into the game, the better. The team, in fact, opted for a quick loading splash screen at the very beginning, then a character selection screen and finally the level selection screen. The team reviewed, then, the concept art for UI elements.

The team agreed on the core animations the game need at this stage: main character walking animations on the two axis (total of four animations), main character idle animation, teacher’s idle animation, teacher “teaching” animation.

The team also developed and reviewed an archetype level design with different obstacles, paths and strategies.

The team also discussed a first draft for a storyline and agreed that the story would have been told via speech bubbles and at the beginning of each level.