Proposal for Orbital 2020

Toleko's Tale

Links to poster/past videos

Poster

https://drive.google.com/file/d/1kwPY4l_s_2RP5G_sORPVpz0rCSPoqWZp/view?usp=sharing

Original Proposal Video

https://www.youtube.com/watch?v=__cuPiBHOCE&feature=youtu.be

Milestone 1 Video

https://www.youtube.com/watch?v=rQm43YTbpy8

Milestone 2 Video

https://www.youtube.com/watch?v=_ydE4VhcVX0&feature=youtu.be

Survey Link:

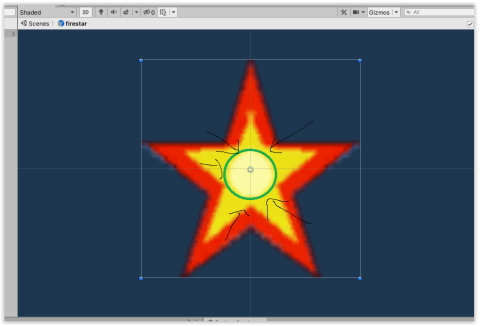
https://forms.gle/zbfgSmnW22PzpppDA

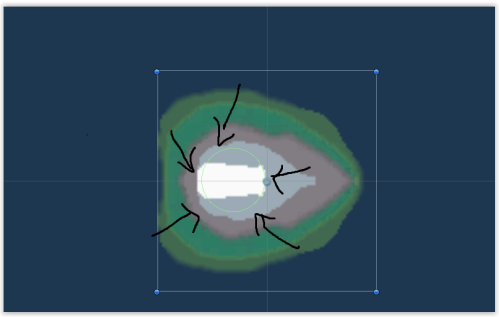
Gameplay Tips for playable demo

Tips on Gameplay:

The game can be quite challenging for players new to the genre as such here are some of the tips that would make our gameplay easier:

1. Like traditional Bullet hell games, the enemy bullets hitbox are smaller than their sprites. For the most part, only the center of the bullet sprites are dangerous. For example,





As such, you are able to touch the bullet as long as you do not touch the centre. Veteran players will be able to figure out precisely the limits of the hitbox over time.

2. Use the bombs when you are about to be hit by a lot of bullets and unable to find a way out. **Pressing "X"** clears the screen of bullets and grants the player invulnerability for a short time. It also deals enough damage to one-shot most small enemies in the game.
3. Remember to use different shot elements. Elements that are strong against the enemy deal 1.5x damage while weak elements deal only 0.5x. Specifically for stage2 (water stage), you should use earth element (green), stage3 (earth stage) should be fire element (red) and stage4 (fire stage) should be water element(blue). This also affects the damage you take. **Press "C" to change the element.**
4. While unlike most bullet hell games where the player dies if they get hit only once, we incorporated a health system to make the game more accessible. However, do try as much as possible not to be hit, as your health can quickly deplete and reach 0. Health also does not automatically recover between stages, so gold has to be spent to restore player health at the shop. **Remember to restore your health to full at the end of each stage!**
5. You can go up to around ¾ top of the screen (known as the point of collection) to automatically collect all dropped gold coins. This is to reward the risky play of going to the top to collect the loot. **However, if there are many bullets on the screen, unless you are confident of reaching the top safely, we do not recommend trying to do so.**
6. Avoid the lasers as much as possible. The lasers deal tremendous amount of damage over time. The player may go from 100% to 0% in as quickly as 2-3 seconds under the laser. The laser hitbox are also smaller than the laser and generally the translucent part of the laser are safe.
7. Have fun and enjoy! While this game is much easier compared to most Bullet Hell games. Newcomers may more than 1 tries to complete the game til stage4. Do not be discouraged if you die the first time!

Milestone 2 Updates

Updates/New Features Developed:

1. Creation of stages 1 to 4 and new bullet patterns to fit the theme of the stages.
2. Boss healthbars and phases.
3. Boss "Spellcard" system(term borrowed from Touhou project for ease of communication between the two of us). Essentially the more difficult and more unique boss patterns.
4. Dialogue between bosses and the player character.
5. Player bombs that deal damage to all enemies on screen and gives a short period of invulnerability.
6. Shop menu where the player can buy healing items, extra bomb and bomb upgrades.
7. Story scene in between stages that give the player some exposition of the story.
8. Balancing of enemy encounters.

For a better understanding of the updates, please watch our milestone 2 demo video.

The General Architecture of the Code Base:

The link to our github is here:https://github.com/tigerting98/tolekos-tale

As of now, we currently have 113 C# scripts and ~7300 lines of code that is written by ourselves apart from the Unity Engine.

The scripts inside the **Asset/scripts** folders are in charge of the game logic, UI, movement, etc while the scripts inside the **waves** folders are in charge of generating the wave patterns and the content of the game. We also have a **game manager object** that is in charge of holding the references to different scripts and prefabs to allow them to interact with each other. The **game data object** stores the enemy bullets, sprites to be used by the waves scripts. The stats are then set up within the wave scripts. The **player data object** stores all of the player stats throughout the game.

As of now, we have refactored most of the backend scripts to allow for easy extensibility. We have however, not refactored our audio and sound effect system. We will look to improve that by Milestone 3.

How to install and test the game:

Download the game from:
https://drive.google.com/file/d/1XdmBPzSzAeI9xU0SAvlB454YeuEuio6u/view?usp=sharing

Or

https://github.com/tigerting98/tolekos-tale/blob/master/Toleko'sTale.exe

Download and run the .exe file and simply install the game. Play the game!

If you are unable to install the .exe file, you can download the zip file here:

https://drive.google.com/file/d/1ir4f8tjF0cBzwLemmFvkiPmkKzKQ3T0Y/view?usp=sharing

Unzip and run Teloko's Tale.exe.

Currently, the game takes around 25 minute to play from start to finish of Stage 4.

Difficulties Encountered:

We were originally planning to complete all 6 stages of the game by milestone 2 but due to certain difficulties we were unable to complete this objective.

1. The first difficulty is the planning stage. A substantial amount of time was spent thinking of fun and unique bullet patterns to use in our stages as we also wanted the patterns to fit the theme of the stage (Water, Earth Fire). The most difficult part of the planning stage was thinking of patterns for the midboss and bosses, as we felt that each of them needed a unique set of patterns to really feel like a boss.

2. To create the enemy patterns, we first had to model the bullet pattern we had in mind mathematically, and then figure out a way to code it into our game. As a result, as the bullet patterns became more complex throughout the stages, more time was also spent creating them in our game. We also had to think of their movement and their spawn timings. Furthermore, a lot

of time was spent balancing encounters to make sure that they are neither too difficult nor too easy.

3. Quite a lot of time was spent refactoring the codebase as well. There were changes that needed to be made in order to accommodate new features such as exploding bullets, lasers, multiple boss health bars, dialogue etc. Also, we had to make our code more efficient due to the large amount of bullets on the screen.

4. Time was also spent on drawing. Most of the sprites are drawn by ourselves with some help from a friend of ours. As both of us are amateur at drawing, it took us quite a while to draw good looking sprites.

5. We also had to learn other Unity features like animation and particle effects so as to reduce the amount of stuff we had to code out by script.

Goals for Milestone 3:

1. Completion of stages 5 and 6
    a. Stage 5 will take place in the villain's castle, where the player fights off his 3 apprentices. This stage will feature a boss fight involving 3 bosses that are firing simultaneously
    b. Stage 6 is the final confrontation with the villain and concludes the story.
    c. We will be designing some new enemies with new sprites and patterns to populate these stages.
2. Implementation of music throughout the stages
    a. For now, our game has no music and it lacks atmosphere, so for the next milestone, we would like to implement music in all our stages.
    b. We would most likely be using free music assets found online.
    c. Ideally, the music used will be different in each stage and for each boss, however, depending on the resources available, there is a chance of music assets being reused.
3. Implementation of more sound effects
    a. So far, there are only minimal sound effects in our game, such as when enemies or the player dies.
    b. We would like to include more sound effects for enemy shooting, such as different sounds for different types of bullets.
4. Graphical touch-ups
    a. We will be improving the graphics of the game by including more stylized sprites with animations.
    b. We will be improving the look and feel of the UI and changing the background images currently used for our menus.
5. Create new difficulty levels
    a. We will be making the other 2 difficulty levels by rebalancing enemy stats and modifying some of their bullet patterns.

Original Proposal/Milestone 1 README

Team Name:

Pokka Ice Lemon Tea

Proposed Level of Achievement:

Artemis

Poster

https://drive.google.com/file/d/1YmZhWRmOen5zBSgPPHMPkcnkAVdMezKO/view?usp=sharing

Video

https://www.youtube.com/watch?v=__cuPiBHOCE&feature=youtu.be

Motivation

As avid gamers, we always wanted to make video games. The game we are currently thinking of is a 2D vertical shooter game, or more commonly known as a bullet hell game. Having played games from the franchise Touhou Project created by Team Shanghai Alice, it inspired us to make a game similar to those found in Touhou Project. The reason we chose a 2D bullet hell game over other genres is that we believe it is relatively easy to develop while still providing a good challenge for us who are new to game development.

This is a video of a stage in Touhou 11. The core mechanics of our game will resemble those found in this game.

https://www.youtube.com/watch?v=pGzWWQvKJOs

Aim

We hope to make a fun bullet hell game where people of all skill levels can enjoy. The game we intend to design would have differing difficulty levels and provide a good challenge to the more experienced player while also remaining accessible to new players of this genre.

User Stories

1. The player will go through multiple stages of increasing difficulty with more complex bullet patterns while getting closer and closer to the final boss.
2. The mechanics of our game would include the player moving their character with the directional keys of the keyboard and a button to shoot bullets at the enemies.
3. The player must dodge enemy bullets too. The bullet patterns faced by the players will range from simple to highly complex, requiring different strategies to effectively maneuver through the gaps between bullets.

4. The player will also be able to upgrade their character as they progress through the game, allowing their character to withstand more hits and deal more damage to the enemies.

5. If the player manages to clear the game, their high score will be kept. The point system will take into account factors such as how long they took to clear the game, how many deaths they had and how many patterns they managed to clear without getting hit, among other things.

Project Scope

The project is focused on developing a 2D bullet hell game. A possible extension that we are looking into is to create a website to host the game client as well as scoreboard.

Detailed Gameplay Features

1. **Player and Enemy Health**

Enemies will have a certain amount of Hitpoints (HP) and different projectiles will carry different damage values. The player character will also have HP, which can be upgraded through the course of the game. When the player character is hit by enemy bullets, he will lose some of his HP. When the player's HP reaches 0 (zero), the game ends.

The player can then choose to quit, or restart from the beginning of the stage. Some enemies, especially the bosses, may have projectiles that instantly kill the player character and thus they are forced to dodge them, instead of simply tanking through it with sheer HP.

The player initially has 100HP and this can be upgraded throughout the game.

2. **Elemental Magic**

There will be a simple elemental system where both enemies and the player can shoot projectiles of different elements. Depending on the element that is being used, the characters will take different amounts of damage. There will be 3 elements: Fire, Water, and Earth.

The damage affinities will be as follows (x->y means x is strong against y):

Fire -> Earth -> Water -> Fire

Furthermore, the element currently being used will determine the spread pattern for the player's bullets.

Fire - A short range cone

3. **Player Upgrades and Special Abilities**

In between stages of the campaign, the player would have access to shops where they can upgrade their stats and buy new abilities. Abilities would provide the players to do various things such as be temporarily invulnerable to damage, slow down time for easier dodging, or removing bullets from a certain radius around them etc.

The player would be able to use powerful, limited spells depending on their current element.

4. **Hitbox**

The player's hitbox is (likely) smaller than the character sprite. Pressing the Shift key to focus will allow players to see their character's hitbox. The player only takes damage if enemy projectiles collide with their hitbox, allowing the player to squeeze through narrow openings between projectiles.

5. **Controls (Keyboard, can be configured in the setting)**

Arrow keys - movement

Z- Normal attack

X - Switch element (Fire/Water/Earth)

Shift - Focus, slowing down movement to allow for finer control.

Storyline

The player takes control of Toleko, an apprentice mage whose master had been kidnapped by his evil rival. Armed with only his flying broomstick and his control over elemental magic, he sets off to rescue his master and faces minions of evil in his journey.

Website Hosting

We plan to create a website for our game. The website will include the game client, information, and any potential game updates and announcements. If time permits, It would also feature a user account setting for players to sign up and create accounts for score tracking.

Timeline: *Our timeline is currently outdated as our targets for each milestone have been changed*

Features	**Timeline**
Liftoff	11 May
Familiarizing ourselves with Unity	11 May - 17 May
Basic character controls and interactions - Character controls (movement and shooting) - Simple enemies that shoot - Collision detection	18 May - 31 May
Evaluation Milestone 1: - Basic proof of concept	1 June

- Simple test stage with some enemies
- Working character-enemy interactions
  - Player health
  - Enemy health
- Basic bullet patterns	

Finishing 1st stage Learning to create sprites and basic animations	2 June - 14 June
Introduce Elemental Magic system (Fire/Earth/Water) Design 2nd and 3rd stages	15 June - 21 June
Refinement: - Testing and debugging the 3 complete levels - Implementing player upgrades	22 June - 28 June
Evaluation Milestone 2: - 6 complete levels - Working Elemental Magic system - Refined boss bullet patterns - Working player upgrades	29 June
Creating character and enemy sprites Implementing later levels Implementing dialogue	30 June - 12 July)
Implementing advanced spells	13 July - 19 July
Implementing scoring system	20 July - 26 Aug
Evaluation Milestone 3: ~Extras - Equipment System	27 July
Difficulty tuning - Bullet pattern tweaks for different difficulties - Damage value tweaks - Upgrade tuning Replay saving	Week 13 & 14 (3 Aug - 16 Aug)
Debugging and testing to prepare for Splashdown	Week 15 (17 Aug - 26 Aug)
Splashdown	26 August

Technology Stack

1. Unity

2. C#

4. PHP/HTML/CSS/PostgreSQL (for website)

5. Asperite (for sprites and animations)

6. Adobe Photoshop

7. GarageBand

Example of Gameplay (screenshot from other games)

Qualifications

Ting Xiao:

Completed CS2030/CS2040S

No past project experience

No other commitments during summer break.

Aloysius:

Completed CS2030/CS2040S

Past projects:

Wrote a simple physics gravity and collision simulator using Java GUI from scratch.

Wrote a GUI program on Python to find the shortest time between 2 MRT stations.

Made a Simple To Do Website with React/ Ruby on Rails.

Project Log

S/N	Task	Date	Hours A	Hours TX	Remarks:
1	Proposal Update	12/5/20	2		
2	Poster/Video making	13/5/20	5		
3	Learning Git	15/5/20	3	3	
4	Learning Unity	17/5/20	4	4	
5	Programming at home	19/5/20	2	2	Created basic game structure
6	Programming at home	20/5/20	2	2	Implemented player and enemy movement
7	Programming at home	21/5/20	2	2	Implemented bullets
8	Programming at home	22/5/20	2	2	Implemented health bars
9	Refactoring code	23/5/20	1	0	-
10	Refactoring code	25/5/20	1	0	-
11	Programming at home	26/5/20	1	0	Added EXP system
12	Programming at home	27/5/20	1	0	Added Elemental (Fire, Earth, Water) system
13	Mentor meeting	27/5/20	0.5	0.5	-
14	Programming at home	28/5/20	0	1	Modified enemy waves for milestone 1 demo
15	Discussion	29/5/20	2	2	Updated GDD with more design details
16	Learning Asperite/Asset	29/5/20	2	2	Created simple sprites

	Creation				
17	Learning Unity/Programming at home	30/5/20	4	4	Modified player shot patterns Modified Main Menu UI
18	Discussion	5/6/20	2	2	Think of enemy and boss bullet patterns for stage 1
19	Programming at home	5/6/20	2	0	Start on implementing stage 1 boss
20	Programming at home	7/6/20	5	0	Implement the shop menu and story scenes in between stages.
21	Programming at home	7/6/20	0	2	Implement stage 1 enemy waves
22	Programming at home	9/6/20	6	6	Finish implementing stage 1 enemies and boss. Balance stage 1 enemy and boss stats
23	Testing	9/6/20	1	1	Testing stage 1 and fixing bugs.
24	Mentor meeting	10/6/20	0.5	0.5	-
25	Programming at home	12/6/20	4	0	Implementing dialogue system
26	Discussion	13/6/20	2	2	Think of enemy and boss bullet patterns for stage 2
27	Programming at home	16/6/20	3	3	Implementing stage 2 enemies Implementing stage 2 midboss/boss
28	Programming at home	18/6/20	3	0	Continue work on stage 2 boss
29	Programming at home	19/6/20	6	6	Finish implementation of stage 2
30	Programming at home	20/6/20	2	0	Balancing of stage 2
31	Testing	20/6/20	1	1	Testing stage 2 and fixing bugs.
32	Discussion	21/6/20	2	2	Think of enemy and boss bullet patterns for stage 3
33	Programming at home	22/6/20	6	6	Implementing stage 3 enemies Implementing stage 3 midboss/boss
34	Programming at home	23/6/20	4	4	Continue implementation of stage 3

35	Mentor meeting	24/6/20	0.5	0.5	-
36	Programming at home	24/6/20	4	4	Finish implementation of stage 3
37	Testing	24/6/20	1	1	Testing stage 3 and fixing bugs.
38	Discussion	25/6/20	2	2	Think of enemy and boss bullet patterns for stage 4
39	Programming at home	25/6/20	4	4	Begin implementation of stage 4 midboss Begin implementation of stage 4 waves Update dialogue and story text
40	Programming at home	26/6/20	6	6	Continue implementation of stage 4 waves. Complete implementation of stage 4 midboss Begin implementation of stage 4 boss Optimize shop and story scene UI to allow for keyboard controls
41	Programming at home	28/6/20	6	6	Finish implementation of stage 4 enemy waves Finish implementation of stage 4 boss Balance stage 4 enemy and boss stats Bug fixes

S/N	Task	Date	Ting Xiao(hrs)	Aloysius(hrs)	Remarks
1	Proposal Update	12/5/20	2	2	-
2	Poster/Video Making	13/5/20	5	5	-
3	Learning Git	15/5/20	3	3	-
4	Learning Unity	17/5/20	4	4	-
5	Programming at home	19/5/20	2	2	Created basic game structure
6	Programming at home	20/5/20	2	2	Implemented player and enemy movement
7	Programming at home	21/5/20	2	2	Implemented bullets
8	Programming at home	22/5/20	2	2	Implemented health bars
9	Refactoring code	23/5/20	0	1	-
10	Refactoring code	25/5/20	0	1	-
11	Programming at home	26/5/20	0	1	Added an EXP system
12	Programming at home	27/5/20	0	1	Added an elemental system
13	Mentor Meeting	27/5/20	0.5	0.5	Met with Prof Zhao to discuss our game ideas and receive feedback
14	Programming at home	28/5/20	0	1	Modified the waves for demo
15	Programming at home	30/5/20	3	3	Modified player shot patters Modified Main Menu UI