15-112 Project Proposal

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* Project Description

“Dark Echo” is a 2D sidescroller game based on the concept of echolocation. The echoes are visualized in the form of lines that will reflect back on boundaries. The player’s goal is to use echoes to navigate a way out of a completely dark environment that potentially includes water zone, red zone, switches and enemies.

* TP2 Update

No major changes have been made from original project design, and the existing features in my game include echo paths fading and reflecting, changing color patterns in special regions (water, redzone, destination, etc.), enemy behaviors and player walking in water and conditionals for failing or passing a level. I also decided to add different sounds when the player performs various actions. Additionally, reflection on curves won’t be considered at this moment.

Before TP3, I need to optimize the enemy’s pursuing patterns and add switches to my game. After finishing the design for objects that my game needs, I will create 8 different engaging levels for the main game.

* Competitive Analysis

1, Another 2D game with the same name “Dark Echo” App Store.

<https://www.youtube.com/watch?v=t4TTuRs0BWA>

2, “Lurking”, a 3D echolocation horror game on Steam.

<https://www.youtube.com/watch?v=_9hrb6z7Yl8>

As you can probably tell, I mainly borrowed the idea from the game named “Dark Echo” on App Store, and my goal is to recreate most of the features of that game with python for my term project.

The original game, including 64 well-designed maps, takes around 5 hours on average for a player to complete. For environmental objects, it includes water zones that will slow the player down and increase the travelling distances of echoes, red zones that will instantly kill the player, enemies that will track down the source of echoes that awaken it, yellow switches that will open new paths in the map and potentially moving walls.

Since echolocation really isn’t a popular game genre, I’m only able to discover another game based on the concept of echolocation named “Lurking”. The biggest difference is that this game is set in 3D environment, and the movement of the player will generate echoes to mark out the outlines of various objects in a completely dark environment.

The goal of my project is to recreate most feature from the original “Dark Echo” game. Besides the environmental objects, I will also add some additional moves for the player to avoid danger. The first move is to throw rocks that will lure enemies away or just check the environment, the second move is to shout that generates powerful echoes that will travel for long distances around the player.

* Structural Plan

My game will include approximately 8 levels, and the map design of each level will be stored in a different python file. My main file will include the player movement, travelling of echoes in different regions (water, red zone, switches, etc.) and the behaviors of enemies. There will be a main menu for the player to select levels and a pause screen whenever the player desires.

* Algorithmic Plan

Although this game has a simplistic look, meaning there’s no need to import numerous images, the algorithms for the travelling pattern and the color pattern of echoes are not simple at all.

The first stage of algorithmic designs include reflection and color fading of echoes. Using two angles, one is between wall boundaries and the horizontal level and the other is between the path of an individual echo and the horizontal level, the third angle after the echo is reflected on the wall will be calculated. A color fading rate will be applied on each echo as it moves away from the player.

The second stage includes the special moves of the player and reflection of echoes on curves.

The third stage is to design the travelling patterns of echoes when they enter special regions (water zone, red zone, switches, etc.) and the enemy AI. This can be achieved by adjusting parameters for the echo object.

* Version Control Plan

All my term project files will be backed up in a folder named “15112 Term Project” in my CMU Google Drive.

* Timeline Plan

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|  | Date | Plan |
| TP1 | 11/20 | Design Proposal and preliminary codes |
|  | 11/21 | Reflection on line and curves |
|  | 11/22 | Special moves of the player |
|  | 11/23 | Redzone and water zone |
|  | 11/24 | Switches and moving boundaries |
|  | 11/25 | Enemy behavior |
| TP2 | 11/26 | Finished two levels |
|  | 11/27 | Finish another three levels |
|  | 11/28 | Finish another three levels |
|  | 11/29 | Review all previous levels |
|  | 11/30 | Put all levels together |
|  | 12/1 | Color optimization |
|  | 12/2 | Collision optimization |
|  | 12/3 | Visual optimization |
|  | 12/4 | Video making |
| TP3 | 12/5 | Pray for a good grade |

* Module List

Pygame is for now the only module I’m using.

* Storyboard

