# CS M152A Final Project Proposal

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Overview

For our final project, we will create a side-scroller game using the FPGA board and a display. The game will consist of a character and several obstacles that appear on the screen randomly and the objective of this game will be to avoid the obstacles. The game will keep track of the score of the player based on how many seconds the player is able to survive in the game, increasing the level and difficulty as time proceeds.
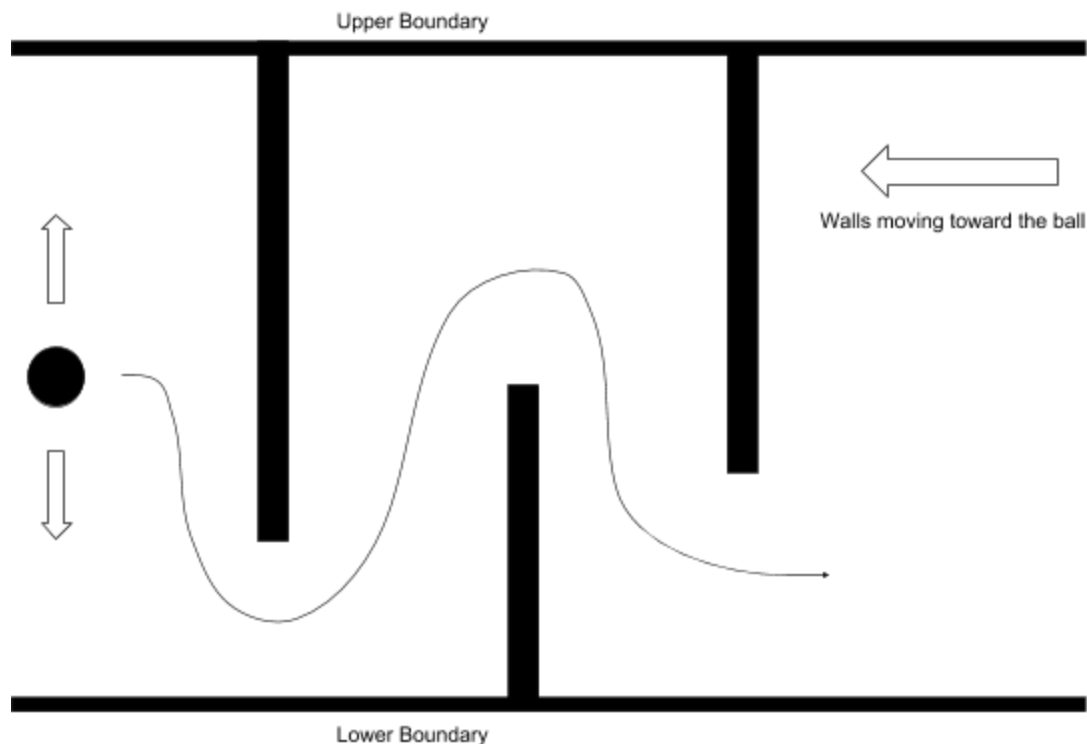
Figure 1: This is a visual representation of what the game will look like once it is implemented.

Game

The implementation of this game will consist of three main parts. The first part is the display: we will use VGA through the FPGA board so that the player is able to see the game as they are playing it. The second part of the game will be the player controls, which we will implement with the up and down buttons on the board. Additionally, we will include one of the buttons as a reset, so that the player can start again if he/she chooses to do so. This will reset the score of the

player and will start them from the beginning of the maze. The final part of the implementation will be the score for the player, which we will keep track of with the seven segment display. The maximum score for this game will be 9999 because that is the largest number we can represent on the display. Evidently, we will have a maximum level of level 9, displayed on the LEDs.

The player will be represented by a circle or square that is allowed to move up or down, but is restricted from moving left or right. The player will need to dodge the incoming walls. These walls are generated with random size so that the player has to be strategic about how he/she maneuvers through the course. Every 1000 points, the speed of the incoming walls will increase to make the game progressively more difficult as the level increases. This change will be reflected in the LEDs.

Grading

Game Environment (30%) - The player, the boundaries, and the walls should show up on the screen. As the game goes on, the walls should move from the right to the left, and they should be coming from off screen onto the screen. Each of these walls should be of variable length, but still allow the player to maneuver through the path.

Levels and Timing (20%) - The pace of the game should speed up after a certain interval of time so that the difficulty of the game increases. The game should transition smoothly.

Maneuvering Functionality (20%) - There should be two buttons that allow the player to move and dodge the incoming walls.

Score Display (10%) - The seven segment clock should reflect the score of the player.

LED Display (10%) - The LEDs should indicate the difficulty the player is currently playing at.

Restart (10%) - The reset button should allow the player to start over by clearing the score back to zero and bringing the game back to its beginning state, clearing the screen.