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Final Project Proposal

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Idea and Overview

Our idea is to recreate the game Flappy Bird and add our own touch to it. Flappy Bird is a game released in 2013 and subsequently removed in 2014 by the creator for feeling guilt over how widespread and addictive the game was. The game is a side-scroller where the player controls a bird, attempting to fly between columns of green pipes without hitting them. We will do this by continuing our progress that we'd made in Lab 6.2, where we worked with NIOS-II to animate a ball onto a VGA monitor controlled by the keyboard. We will be using a SoC that closely resembles that of Lab 6.2, along with several other files that we will carry over. Some files we will add are SystemVerilog files to control the pipes that will appear from right to left, and a file to keep track of the score. Furthermore, balls.sv will be modified to fit the bird, adding gravity and bounce abilities. We will also need to add collision checking to this updated file for the pipes as well as the walls. Finally, we will need to add a state machine to control the game logic, starting from the start screen and ending on the player quitting or hitting a pipe. The finished game would have all of the functionalities of the Flappy Bird game, including a bouncing character (to be decided) that will fly up and down the screen, pipes of different length and different gaps that will appear from the right side of the screen, coins that will randomly appear for the character to collect, a scoreboard, and other features unique to our version of the game. The final demo will be carried out by showing all of the features we list below by actually playing the game.

List of Features

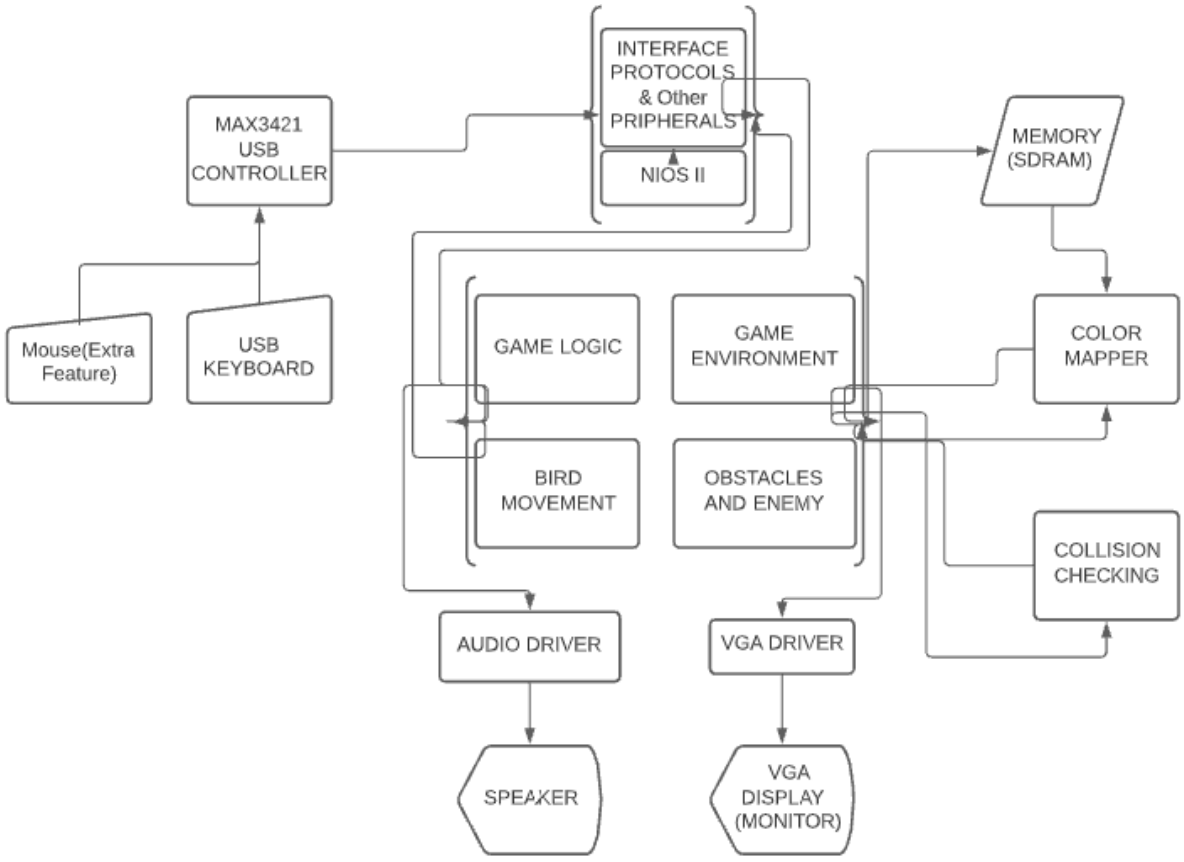
Baseline

1) Character bounces correctly
2) Pipes move from right to left with random spacing from top to bottom
3) Coins appear randomly throughout the map and disappears when collected
4) Scoreboard keeps track of distance / coins
5) Main menu to start and end game

Additional features

1) Game produce sounds when coins are collected, as well as music that can be toggled off
2) Background moves as we travel
3) Character and pipes look realistic
4) Scoreboard that shows at the end of a game
5) Able to choose difficulty level
6) Speed increase as we progress through the game
7) AI character that moves for you

Block Diagram



Expected Difficulty

The baseline difficulty level would be around a 4/10, with the basic features being pretty straightforward but still challenging to implement. We would ideally be able to complete a lot of the additional features, with the sound, background, realistic graphics, and AI particularly bumping our difficulty level up. With all of the features above, we'd say the overall difficulty level would be around an 8/10.

Proposed Timeline

Week 1: In week 1, we'd like to research the modules we would need to implement all of the features of our game.

Week 2: We will be working on the software side of the project and fine tuning the essential functionality of our game. We will also be perfecting the score board .

Mid-Checkpoint: We will be presenting the bird flapping and the game environment as well. The collision of the bird with the obstacles or gaming environment. The environment should be able to move as the game proceeds

Week 3: We will be primarily working on the coin system and pattern which will increase in intensity depending on the difficulty of the game.

Week 4: We will be working on the audio of the game and designing sprites for the intro animation.