CS152A Final Proposal

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Overview

Our project is a 2-player Pong game. Users will use buttons to control the direction of the two paddles. The score will be shown on the screen and can be reset.

Game

Pong is a 2-D game that features two paddles on opposing sides and a ball. Each player controls an in-game paddle that they can move vertically. Player 1 will use the up and left buttons on the FGPA board to move his or her board up and down, while Player 2 will use the right and down buttons. Players use the paddles to bounce the ball back and forth. A point is scored when the ball is hit past a paddle. The goal of the game is to score as many points as possible. The score is displayed on top of the screen and goes up to 99. The game will be displayed using a VGA adapter.

Grading Rubric

VGA Display (30%) - The Pong game is displayed on VGA correctly. It has two paddles on opposing sides, a ball at the center and both players have an initial score of 0.

Paddle Movement (15%) - The two paddles can be moved vertically in either direction. The paddles stop moving once they hit the walls.

Ball Movement (25%) - The ball will move in a constant direction until the collides with either a paddle or a wall. If it hits either the top or bottom wall it will then deflect off the surface where the angle of incidence is equal to the angle of reflection. If it hits a paddle the incoming angle is disregarded and a new angle is determined by the ball's distance from the center of the paddle. If it hits the center of the paddle it is sent exactly horizontal, whereas if it hits the edge it is sent off at an extreme angle (75 degrees).

Scoring (10%) - When a player hits the ball past the opposing player's paddle their score is incremented. The ball is then reset to the middle of the x-axis and randomly along the y-axis. It is sent towards the player that got scored on. Both paddles are reset to their initial positions.

Reset Functionality (5%) - The game is reset with the score display being set to 0 and the paddles and ball being set to initial positions.

Multiplayer (10%) - Two paddles on opposing sides that can be controlled by FGPA board.

Obstacles and Difficulty Levels (5%) – Adding obstacles near the center of the board adjacent to the top and bottom borders, which reflect the ball, like a paddle. Also, ball speed is determined by the difficulty level, which in turn is determined by the switches (the most left switch corresponds to the highest difficulty level.