

ECE 385
2021 FA

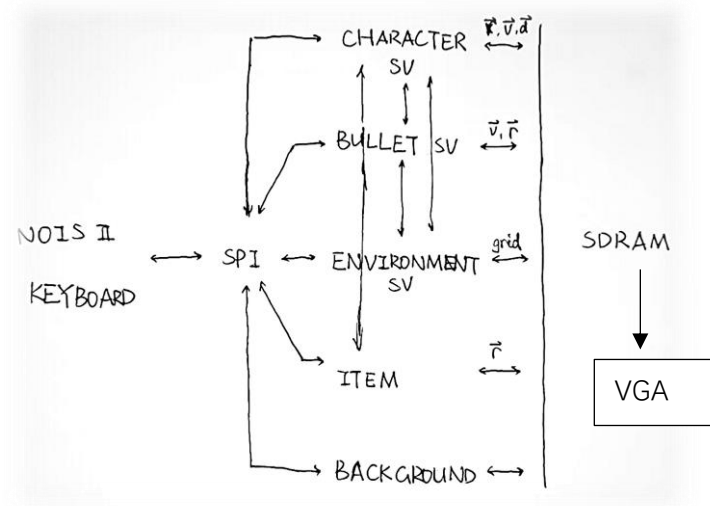
Final Proposal
2D Arena Shooting

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Idea & Summary

For the final project, our goal is to create a properly functioning 2D Arena Shooting game on the DE2 board, along with further implemented upgrade like graphics, statics or sound to the basic game if possible. To accomplish the task, our design will borrow the lab design of NOIS II SoC with VGA and USB interface from lab 8 and combines the hardware with System Verilog module and C++ software which will be completed by ourselves. In the additional part, we would implement other module from GitHub to improve the game quality and experience, if possible. Thus, our majority task is to build and test the game on several System Verilog and C++ modules.

Block Diagram



Features

Game Rule

It is a 2-player PVP Arena Shooting game. 2 players will spawn on the corner of the map, respectively. The map is a float island in the sky, which means one have to shoot the other down the island to win the game.

Key to use:

A(moving left), S(shooting), D(moving right), W(jumping)

Left, Down, Right, Up

Basic Level

1. Motion: Object and character motion, including character moving left and right, jumping, flipping.
2. Physics handling: gravity, collision detection, collision reaction.
3. Object respawn: Respawn characters, bullet, item correctly, in a shape of stick
4. Interaction P-E: Character could acquire items and be transparent to each other.

Medium Level

5. Interaction P-P: Character could shoot bullets as an object and could be hit by a bullet. When a character gets hit, it will get a velocity in the direction of bullet (greater than character motion), with the disappear of bullet.
6. Elegancy: Improved background and character
7. Score record on the screen.

Advanced Level

8. Sound Module: Difficult hardware part, which would be completed by include project from internet.
9. Advanced Game Rule: Detailed bullet type and character type.

Expected Difficulty

The expected difficulty for our design would be 5/10 (Basic Level), since the game is pretty like Mario or Pacmen with enhanced physics.

However, with the further improvement implemented in the game, the difficulty level will increase. For the medium, we plan to add the shooting function and improve the appearance of the game. which would create certain complexity to our game and leave us a lot of work to complete. For the function of shooting, which is the core function of the game, we must compose a series of new rules to accurately describe the behavior of bullet and character getting hit. The background and appearance improvement will involve the process of pictures, fonts and other complex visual elements.

For the advanced improvement, it will be carried out after the main function of the game is completed and tested to perform properly. The advanced game rule and sound module will make the game more like a flash game, which, on the other hand, leave us tons of work to accomplish.

Proposed Timeline

Week 2/3 - get base game completely debugged and working

Week 2/3 and Week 4 - add difficulty (sound, multiplayer, sprite, etc)

Week 5 - Debugging