

ECE 385

Final Project Proposal

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1 Idea and Overview

Our project proposes the development and implementation of a Russian Roulette-style game for two players, executed on an FPGA platform. This interactive game will emulate the high stakes and strategic decisions of Russian Roulette in a safe and controlled digital environment. Each player, acting in turn as the dealer, will decide the number of bullets to load into a virtual revolver and choose from three potential actions: shooting the opponent, shooting into blank, or shooting themselves.

This game is intended to be a local two-player party game, where one player acts as the dealer and the other acts as player 2.

Game Rules and Player Choices

The game is inherently turn-based, with each turn involving the following key decisions and outcomes:

1. **Bullet Loading:** At the start of each dealer's turn, the dealer chooses how many bullets (1 to 5) to load into the revolver. This decision directly impacts the risk and potential reward for the turn.
2. **Action Choice:** The dealer then chooses one of three actions:
 - **Shoot Opponent:** If the player choose to shoot opponent, then if a bullet is fired, then the player will get 10 points. Otherwise, the player will lose 10 points.
 - **Shoot in the Air:** If a bullet is fired, then the player will get 2 points. Otherwise, the player will lose 1 point.
 - **Shoot Self:** If the player choose shoot self and a bullet is fired, then he will lose 10 points. Otherwise, the player will get 5 points.
3. **Taking Turns:** After the dealer load the bullet, the revolver will pass to the player 1. When the player 1's turn is over, the revolver will be handed to player 2. After 6 turns, then one part is ended.
4. **End condition:** The game end when four parts is ended, and the winner will be the player with high points.

List of Features

- **Local Multi-player:** Two different players will see different views of the game as if they are sitting opposite to each other.

- **Graphical User Interface:** The game will feature a simple yet intuitive GUI that displays the current state of the game, including the number of bullets loaded, the current player's turn, and the number of chips each player has.
- **Sound Effects:** Audio feedback for shooting actions enhances the immersive experience.
- **Control:** The game is controlled by the keyboard. Players use different keys to instruct different actions.

2 Block Diagram

Here is the overall system design of our game.

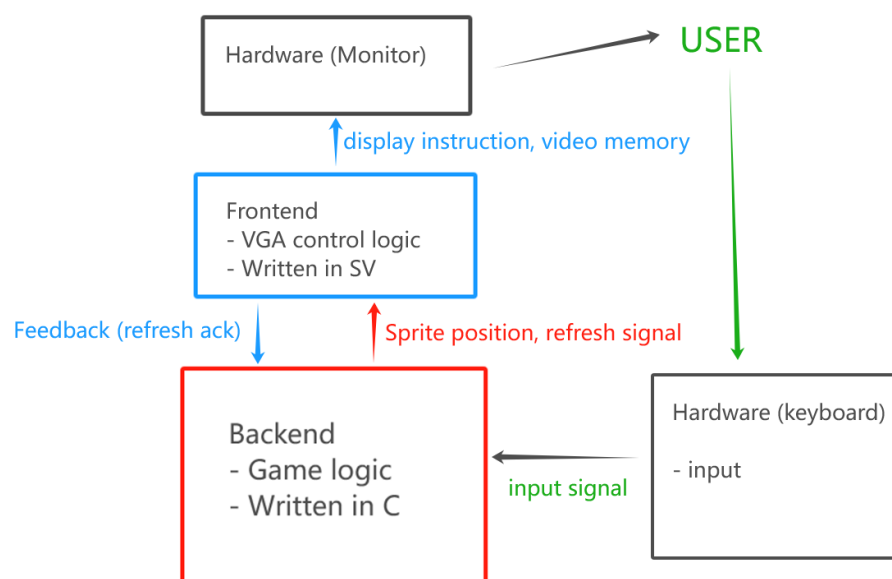


Figure 1: Enter Caption

3 List of Features

Baseline Features

- Keyboard input for player interactions.
- Game logic to handle the sequence of game actions and rules.
- Basic visual and textual output on a VGA display.

Additional Features

- Animated graphic display for more engaging player interaction
- Sound effects for shooting actions.

4 Expected Difficulty

The baseline project difficulty is estimated at 7/10 due to the need to implement robust game logic and handle real-time input and output. The addition of advanced graphics (including animations) and sound could increase the difficulty to 9/10, as these require integrating more complex FPGA functionalities.

5 Proposed Timeline

- **Week 1:** Concept development and initial design. Choose the hardware to use.
- **Week 2:** Hardware architecture design. Game logic development starts.
- **Week 3:** Implementation of game logic and input handling.
- **Week 4:** Adding advanced graphical and sound features.
- **Week 5:** Testing, debugging, and final preparations for demonstration.