

UNIVERSITY OF NEVADA LAS VEGAS. DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING LABORATORIES.

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Instructor's comments:					

Goal: The goal of this project is to become better familiarized with coding in SystemVerilog and the connections between the modules while making an interactive game utilizing the FPGA board and visual display using a VGA.

Abstract: A spaceship is stranded in space. Asteroids move toward the spaceship at varying speeds. The spaceship has to dodge these asteroids as long as possible.

Project Structure:

- **Top-Level Module:**
 - Manages all major components of the game.
 - Instantiates other modules and handles signal routing.
- **VGAController and VideoGen Module**
 - Generate timing signals
 - Generates a simple starfield background.
 - Potentially a parallax scrolling effect for added depth.
- **Rocket Module:**
 - Defines the rocket's visual representation.
 - Handles player input (Initially left/right for simplicity)
 - Collision detection logic.
- **Asteroid Generator Module:**
 - Randomly spawns asteroids of varying sizes and initial positions.

- Controls asteroid scroll speed and movement patterns (initially straight down for simplicity, but angled if time allows)
- **Scoring/UI Module:**
 - Keeps track of the player's score.
 - Displays the score onscreen.
 - May handle additional UI elements like a "Game Over" screen.

Development Approach

1. **Start Basic:** Beginning with simple shapes for the rocket and asteroids and focusing on getting player movement and a single asteroid moving.
2. **Collision & Scoring:** Implementing collision detection and basic scoring logic.
3. **Asteroid Spawning:** Building the asteroid generator, gradually increasing difficulty.
4. **Visuals:** Add the background, refine UI elements.
5. **Power-ups/Twists:** Once the core game works, I will consider power-ups or special asteroid types.

Block Diagram

