

CSEE 4840 Embedded System Design  
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Project Proposal

## Snake Game

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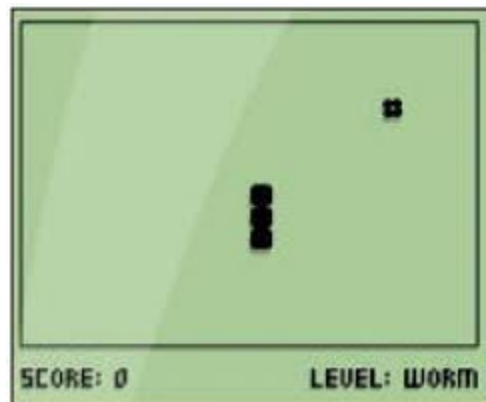
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### 1. Introduction

In this project, we will use an FPGA to drive the VGA display for the implementation of the game "Snake." The game involves the player controlling a long snake using directional keys to continuously eat apples. The snake grows longer with each apple consumed, and the game ends if the snake's head collides with its body or a barrier. The project will be written in Verilog language and will involve knowledge related to VGA display, state machines, and other related concepts. Overall game logic:

Keyboard Input → 2D Game Logic → VGA Display



### 2. Design

Inputs: Keyboard

Outputs: VGA output for the game interface, Speakers

**Keyboard:**

During the game, the keyboard can be utilized to control the character's movements, including forward, backward, left, and right. In addition, specific keys can be pressed at any time to allow the user to reset, pause, continue or quit the game as desired.

**VGA:**

The game is displayed on the monitor screen using the VGA display port.

**Speaker:**

The speakers will emit the music and sound effects for the game.

### 3. Possible Game Features

- Snake can maneuver around the screen and collect apples
- Apple location is randomized by using user input as seed value (avoid being appearing on snake body)
- Score is kept and display on the screen
- Self-collision
- The length of snake grows as it collects apples