

CSEE W4840 Project Proposal: Snake Plus Video Game (snake+)

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Overview:

We will be implementing the classic snake game, but with a twist. The game will feature two snakes, played by two people (or one person with two hands). Two small snakes will begin at opposite corners of the game display, and players will utilize four control keys (up, down, right, left) to move their snakes throughout the display. Dots of “food,” and additional power-up items will appear on the screen, for which the snakes will have to race one another. The first of the two players to run into their own tail loses. Running into the opposite player’s tail will negatively affect the player by shortening the length of your own tail. To play a game, players will sit at the same station with DE2 Board, VGA display, and a single keyboard. Control keys for each of the two players will be on opposite sides of the keyboard (arrow keys and a,s,d,w).

Implementation:

The game will require a VGA display, PS/2 keyboard, memory, and audio. Each component will have a hardware controller. The game will be implemented on the altera cyclone II FPGA with the development done in VHDL and C. The Nios 2 processor will be used to program the game logic.

1. Input: Data will be received from the keyboard. This keyboard input will be used to control the movements of the snake.
2. Output: GUI display to a VGA monitor, as well as some background audio.

Algorithm:

1. Collision detection: based on x, y coordinates of players’ snakes, food, and walls.
2. Scorekeeping: based on length of each snake and time elapsed.
3. Timekeeping: based on clock ticks.

Hardware vs Software:

1. Hardware: VGA controller, PS/2 keyboard controller, audio controller
2. Software: Game logic