This Snake is Down Right Fierce

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6.111 Final Project
Introduction

• Object of the game is to eat “fruit” to grow longer and avoid hitting the walls or yourself

• 3 different levels

• Player can control the snake using a PS/2 controller
Design Considerations

- Major/Minor FSM abstraction to control game logic
- Use block RAMS to display background and sprite to display the rest of the objects
System Overview

PS/2 Interface

clk

data

Controller data

31.5 MHz (all blocks)

fruit_pos

27 MHz

DCM

8

Control Block

new_pos

num

snake_pos

20

Snake Pos Registers

RGB Signals

24

Display

bspire_count

line_count

10

10

VGA

VGA Signals

Background Memory
Growing the Snake

• Snake represented as many segments drawn on top of each other

• Can grow the snake by changing the relative position of the sprites

[Diagram showing the growth of a snake from one segment to multiple segments]
Control Block

- Control Block contains game logic and encoder for output from the PS/2 interface
Control Block

• Minor FSM checks for collisions between the snake and the wall, the snake and itself, and the snake and fruit

• Checks for collisions with walls by using the RGB value from memory

• Checks for collisions with snake by comparing position of the head with the position of the rest of the segments

• Outputs a lose signal if snake does something that causes the game to end

• Writes new positions of the snake segment to the registers if game continues