

CSEE 4840 Project

Jerry Lin (ml4686), Leo Qiao (flq2101)

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1 Overview

We plan to implement a 2-D game. At the moment, we have chosen to implement Pac-Man. However, the decision of which game to implement is still up to changes. The main goal is to use the FPGA to implement a simple hardware-accelerated 2-D graphics API, which we will then use to create the game of choice.

2 Design Outline

- Hardware: The FPGA will receive graphics commands from the driver on the bus. It will execute corresponding behaviors as instructed by the commands. These behaviors will be dictated by SystemVerilog code that runs on the programmable section of the FPGA. The game will be controlled by the player through an USB HID device, most likely a keyboard.
- Driver: The driver will provide an API that sends graphics commands to the graphics hardware.
- Software: The software will be the game logic that manipulates the frame buffers using the driver in order to update the screen to reflect game state. The software will be written in C and will control the ARM section (HPS) of the SoC.

3 Goals

The goal is to implement a 2-D game (possibly Pac-Man) on top of a 2-D graphics API that is hardware-accelerated. Potential fall back options include similar grid-like games such as a maze or minesweeper.