Pac-Man Design Proposal

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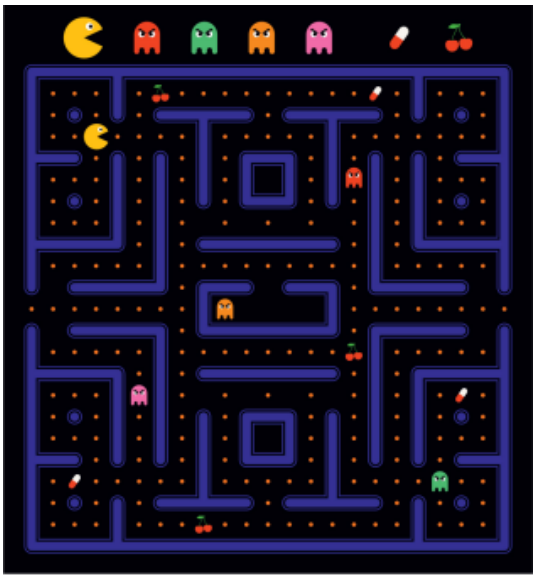
Project Overview

This project aims to implement a fully functional Pac-Man-like game on an FPGA platform, specifically the Cyclone V FPGA. The goal is to create an embedded system capable of running a classic arcade game with real-time graphics, logic and interaction. The system will be developed to efficiently execute game logic and manage hardware resources, ensuring smooth game performance with the constraints of the FPGA hardware.

1. Introduction

Our goal is to construct a traditional 2D Pac-Man-like Game. The user-controlled Pac-man sucks in as many resources as it could be while the other four enemies would hinder the player and take up these resources as well. Differing from the traditional Pac-Man, due to the limitation of FPGA, our initial idea is to introduce either an Intelligence system to control these energies (the number may be various, depending on the memory of FPGA), or another player will control another Pac-Man. Based on the game's logic, our designation may also introduce some interesting mechanisms!



2. Software Requirement

1. Linux environment;
2. VS Code;
3. VHDL;

3. Hardware Requirements

1. FPGA: a project-required integrated circuit;
2. VGA monitor: the monitor of takes the data to display the game synchronously.
3. Keyword: the keyword to control the movement of Pac-man.
4. Sansui 3.5mm audio jack audio: output sound effects through the game

4. Milestones

1. Design and implement the basic logic of Pac-man, using pixels to present each object;
2. Continue configuring with monitor and control pixels to output ideal output;
3. Seeking and manipulating interesting sound effects and configuring with our audio;
4. Debugging and final presentation.

5. Game Block Diagram