

Gesture Controlled Game Design on FPGA Platform

This project aims to design a well-known game, such as the Fruit Ninja, on an FPGA platform. Instead of finger swiping on a touchscreen as for the game of Fruit Ninja, a camera will be used to track user's hand movements which will act as the controller for the game. Users will wear a blue or red glove to play the game and facilitate hand tracking on FPGA. The game score, level and lives left will be displayed at the bottom of the display. Game ends after final level or all lives are lost. Sound effects will also be considered.

Project Requirements

User-input must be through a video camera. One or more hand gestures must be defined depending on the game designed.

Multiple levels of increasing difficulty, such as increased speed, frequency, etc., must be designed.

The final outcome must be a game that could be played with hand gestures.

Team Requirements:

Good understanding of FPGAs

Excellent skills in VHDL programming and block-level design

Knowledge in image processing is a plus.

Knowledge in shell scripts or python programming is a plus.

Team Responsibilities:

This project requires one electrical engineering student and one computer engineering student. Electrical engineering student is responsible for designing the input module including camera output's data saving as a frame, its conversion and image processing, and input detection. Computer Engineering student is responsible for the game design including randomized positioning, interaction with user-inputs and sound generation and video output. Both students are expected to all aspects of the project.

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