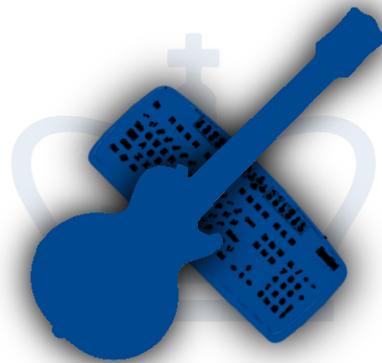


THE AWESOME GUITAR GAME

Project Proposal

Embedded System Design
CSEE 4840

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1 Introduction

In this project, we implement an interactive game where the user can play a dummy guitar to match up the notes as displayed on the screen. The game principle is the same as in the famous "Guitar Hero" video game series. The expected music will be played softly in the background and will grow louder whenever the user presses the correct key.

2 Design

We intend to implement the project using an Altera DE2 board, a dummy guitar, a VGA display and a pair of speakers. When the user starts the game he/she will hear the music. The screen would display a stream of notes. If the user presses the correct button at the correct instant, the particular note is added to the music and is played loudly. To make the user more involved, the display will reflect that the note has been correctly played. The implementation will be done on VHDL and C. We plan to have 4 buttons on the dummy guitar which would be connected to the GPIOs of the FPGA. We will also implement some audio processing to make the game even more entertaining if time permits.

3 Milestones

Milestone 1

- We will construct the dummy guitar.
- We shall detect key inputs with the dummy guitar.
- We will play a song (raw sound format) from a SD card in the FPGA.
- We will develop a program to build a script of a given song. This means, to produce a file that contains the notes and their corresponding positions for this particular song.
- We shall finally make a prototype of the base game engine in Java.

Milestone 2

- We will work on the sprites and study how to do graphics and how to encode the sound efficiently (how many bits, how many information we can store...).
- The Java game prototype will integrate the work on scripts from the first milestone.
- We shall have designed the game internal functioning to ensure a constant frame rate (on paper).
- We will have started implementing the game.

Milestone 3

- We shall finalize the game.
- We will develop an algorithm to compute the score.
- We shall improve the performance of the game and work on the graphics.