**ECE 346 – Microcontrollers**

**Spring 2015**

Project Proposal

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**Overview**

Field Programmable Gate Arrays (FPGAs) have a use in a wide field of applications. With the applications so versatile the boards are highly extensible, and customizable. Even with such a wide versatility of possible applications at times they are not completely the best option for all projects. A major benefit of the DE0-Nano is although it may not be the best option at all times for some projects, it is very compatible to interface with other development boards that may have strengths in different areas that the DE0-Nano does not. Specifically in the case of our project the LED display in which we have selected does not have much functionality when written in C or assembly. The way that we have the DE0-Nano configured for this course does not work in any other programming language. This was a problem in which we ran into shortly after receiving our display. Luckily the DE0-Nano does have the ability to work with other development boards that are capable of operating in other programming languages. In order to use the display in which we have ordered we are going to have to interface the DE0-Nano with an Arduino. The Arduino has the required libraries provided by the manufacturer of our display that allow us to control the display how we would like.

Due to incompatibility with the DE0-Nano Board and our 16x32 RGB LED matrix panel we have decided to modify our semester project so that we can use an Arduino board that is compatible with our matrix panel and drive power into this specific board with our DE0-Nano board to control the 32x16 RGB LED matrix panel. Using the Arduino Board with power being supplied from the DE0-Nano we hope to achieve the RGB LED matrix panel to light up and switch colors if instructed, possibly even display a certain image if the option is available.

**Goals**

* Be able to interface the LED array
* Be able to drive power into Arduino Board
* Use the Arduino to light up the LED matrix panel instead of DE0 Nano Board
* Possibly load images on to the LED display

**Tasks** **To Be Completed By Midterm**

* Naomi Filio
* Begin programing the Arduino
* Determine the best way to interface the DE0-Nano and the Arduino
* Daniel Sciortino
* Determine the best way to interface the DE0-Nano and the Arduino
* Determine the best possible setup to connect the LED panel and the Arduino

* Jonathan Scroggins
* Order the board and all of the required materials
* Assist in formulation of the pseudo code and determining the best setup for the devices
* Andres Dominguez
* Help with setting up the Arduino
* Begin programming the DE0-Nano board

**Tasks** **To Be Completed By Final**

* Naomi Filio
* Write the final report
* Determine the images to be displayed on the LED display and the required format in which they need to be in to be compatible to display
* Daniel Sciortino
* Use the produced pseudo code to formulate and complete the programming of the FPGA
* Wiring
* Write the final report

* Jonathan Scroggins
* Make sure all needed supplies are available
* Program the FPGA with the produced code and test the functionality
* Wiring
* Write the final report
* Andres Dominguez
* Assist in programming and testing the developed program
* Record notes during testing in order to go back and fix any issues or to use when writing the final report
* Work on the schematics of the circuitry
* Write the final report

**List of Materials**

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Price | Quantity | Total |
| 16x32 RGB LED Matrix | $24.95 | 1 | $24.95 |
| 5V 2A Power Supply | $7.95 | 1 | $7.95 |
| Female DC Power Adapter | $2.00 | 1 | $2.00 |
| Arduino | $24.00 | 1 | $24.00 |
| www.adafruit.com |  | Sub-Total | $58.90 |