Lab 5 Project Proposal

FPGA Digit Recognition

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**Introduction**

Our Lab will utilize the FPGA as a character recognition device. We will input a 26 x 26 bit image into the neural network that we will have pre-calculated and stored onto the FPGA. Perhaps there is too much data that needs to be stored on the FPGA, in this case we would need to store more of the data in an external memory device. We will then have the FPGA calculate the output and display it in binary on the LEDs.

**System design**

We will have several neuron modules that all have the same structure. Each neuron has an array of inputs, pre-loaded weights, and a single activation output. We will store all of these neuron modules in the FPGA and configure them in the way that they create a neural network. The hardest part of this lab will be figuring out how to perform the sigmoid function.

**Timeline**

Week 7: Get all weights and bias that we will input onto FPGA and start investigating on how to have a sigmoid function.

Week 8: Figure out how to store weights onto the FPGA.

Week 9: Finish working on how to store the weights onto the FPGA, figure out how to have the FPGA take in a 26x26 bit input and use it to create a hypothesis.

Week 10: Finish working out the FPGA to create a hypothesis based on inputs and work on representing the output of the neural network in the LEDs.