

# EE/CprE/SE 492 Biweekly Report 2

2/19/2023 - 3/4/2023

Sdmay23-28

## Digital Chip Fabrication

**Client &/Advisor:** Dr. Henry Duwe

### **Team Members/Role:**

Katherine Gisi: Spokeswoman, SNN neuron design, Leader

William Zogg: SNN neuron Design

Tyler Green: Software tool research, Environment setup

Aaron Sledge: Software tool research & Documentation

Fulai Zhu: Documentation

### **Weekly Summary**

- Group meeting on February 20th, discuss with the advisor the details of the chip design of SNN, make the report of the function of the PCB.
- March 2nd group meeting, the group discussed issues about chip design, finishing the tutorial document, and subsequent project planning.

### **Past week accomplishments**

1. Designed the beginning RTL for a neuron in Caravel
2. Hardened and verified neuron output using logic analyzer.
3. Finish the research about PCB, know and understand the basic functions of caravel\_Nucleo.
4. The tutorial documents are in progress.
5. Finished the tutorial for the Klayout tool as well as test benches for project design

### **Pending Issues**

1. How to fit all of the SRAM data we need into the user area. We may need to reduce the size of the network or precision of the arithmetic.
2. The submission of eFabless project.
3. Finalizing the Caravel tutorial document

### Individual Contributions

NAME	Individual Contributions	Hours this week	Hours cumulative
<b>Aaron Sledge</b>	Finished the tutorials for the Klayout tool as well as the tutorial on how to use the test benches in the caravel environment. Will finish the tutorial document by the end of this weekend	3	30
<b>Katherine Gisi</b>	I worked on wishbone usage in environment. Tried to figure out how to connect it to neurons. Drafted Design diagrams for the neuron, control logic, and cases.	6	25
<b>Fulai Zhu</b>	Write the document to understand the efabless caravel board 1. each part function of caravel_Nucleo link: 2. how each part on the board connects to each other 3. how the caravel board connects to the user-area and how to test the user-area.	6	28
<b>Tyler Green</b>	Began RTL development, worked with Kat and William to get a design ready and started to simulate in Caravel. Began work independently on SRAM interaction with neuron module.	6	36
<b>William Zogg</b>	Worked on RTL development with Kat and Tyler. The Neuron RTL model is finished and works as expected. I am currently working on the surrounding control logic that will interact with the neuron.	6	26

### Comments and Extended Discussions

(Optional)

#### Plans for the upcoming week

The plan for next week is to keep working on the RTL development and make a simulation for the design in caravel. Besides, we want to finish the tutorial document for our project.

#### Summary of weekly advisor meeting:

In this week, our advisor provided guidance on the arrangement and design of our control system and spiking neurons in digital chip. Also, our advisor pointed out issues in our design and gave directions and suggestions for revisions. In addition, our advisor has given revisions to our caravel\_Nucleo documents.