

## EE / CprE / SE 491

# Machine Learning Heterogeneous Computing

## Week 7 Report

Time: Mar.19 - Apr. 2  
Client: JR Spidell  
Faculty Advisor: Diane Rover

### Team Members:

Sandro Panchame  
Rudolph Nahra  
Alek Comstock  
Jeffery Kasper

### Weekly Summary

This week, the team started working in Vitus so we can start learning how to use OpenAMP to control the flow of information on the Kria board. Rudolph and Sandro learned more about the tasks they had been assigned on the Machine Learning side of the project.

### Past Week Accomplishments (2 weeks?)

**Jeffery K:** Wrote pseudo code for OpenAMP communication. The code is for the cores in the APU which is defined by OpenAMP as the cores that are handling the linux environment.

**Sandro P:** Created frames from the avi files, then created versions of those frames with the glare removed. Also, discovered everything involving the specular library was not using the library at all. Error\_calc was the code used to achieve this. Previous team had positive results with the model when glare was removed. Read a paper on Marabou and created slides on it, along with how to use it (this was requested by the client). Ended up having to rebuild it, some issues arose after updating the OS. Ran some unit tests to make sure it was working, they passed. Ran the example code found in the Marabou repo, all but one had issues (might be an issue with the sample code. Possibly out of date). Ran marabou on the command line, it worked. Not sure how we will define the properties to test the model we will be working with. Tried contacting a contributor of the Marabou project about system requirements, considering Rudy ran into issues running Marabou. The person in question is Guy Katz, a professor in Israel, and he is currently on parental leave. Not sure if he will respond to email.

**Alek C.** Jeffery and I worked on developing some pseudocode. We have an idea in mind as to how we want each of the cores to communicate with each other. We talked with our advisor, Dianne Rover, and she wanted to make sure we kept scalability in mind when designing our code; we may need more or fewer cores that we are initially planning on using.

**Rudolph:** Troubleshooting Marabou segmentation fault. Changed operating system on cloud server from Oracle Linux to Ubuntu, did not work. Instead, I am now dual-booting Ubuntu on my desktop to use Marabou. It was still giving a segmentation fault, so I have been investigating possible issues with the model itself.

## Pending Issues

**Sandro P:** Will need to figure out how to define the properties that will run alongside the model in Marabou. Instructions might be available somewhere, but not readily available. Worst case scenario, will have to go off of the Marabou python file and the .nnet file used in an example. Another option, use the Marabou API instead of the binary file.

**Alek C.** The first steps towards getting a 'helloworld' or a simple 'handshake' program onto the board are not very clear, it will take some digging into documents and experimentation.

**Rudolph:** Marabou is giving a segmentation fault error and I cannot find a way to fix it. I may need to post an issue on their github page. I should additionally investigate our model and if there may be issues that prevent it from running with Marabou

## Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Sandro Panchame	Created a dataset with glare removed for training. Did some reading on Marabou. Got Marabou running, and created a slideshow explaining Marabou (at the request of the client).	15	39
Rudolph Nahra	Troubleshooting Marabou issues - changed operating system on cloud server, installed ubuntu on home desktop, experimented with different Marabou settings.	6	45
Alek Comstock	Designed pseudocode, preparing for translating pseudo into actual code. Preparing for actual board programming	10	36
Jeffery Kasper	Psudeo code for OpenAMP communication and data processing.	12	45

## Plans for Coming Week

**Jeffery K** : Begin to turn the pseudo code into C code that utilizes OpenAMP for inter-processor communication.

**Sandro P**: Figure out how to get our model to run on Marabou

**Rudolph**: I may need to post an issue on their github page. I will see if Marabou will be able to run on a (much) simpler version of our model. Continue developing safety tests for the model.

**Alek C.**: start adding openAMP API calls into the pseudocode. Be prepared to present pseudocode to the group and JR. Potentially convert the pseudocode into actual code, bit by bit

## Meeting Notes 4/2

Will have to double check the slides, notes are there.