

EE / CprE / SE 491

Machine Learning Heterogeneous Computing

Bi-Weekly Report #3

Time: Sep. 27 - Oct. 11
Client: JR Spidell
Faculty Advisor: Diane Rover

Team Members:

Sandro Panchame
Rudolph Nahra
Alek Comstock
Jeffery Kasper

Biweekly Summary

These weeks, the team made progress in configuring the operating system of our board to allow us to implement. Specifically, we have partitioned the memory and configured 4 processors to each run a standalone program. Also continued to refine our dataset that we will use to further train our model.

Past Bi-Weekly Accomplishments

Jeffery K: With the assistance of Rudy I was able to successfully compile a custom petalinux image. Using this image I was able to make a Vitis AI platform project.

Sandro P: Received the requested VM from the ETG service. Trimmed down the dataset and deleted data we could not use. Wrote down some python functions to go through a large dataset. The functions should be able to extract frames, obtain the runtime of the videos, and move files into their respective folders. Worked with the Remodnav library, I'm confident with how to use it without the command line now. I'm able to extract the labels tied to movements from position points.

Alek C. Worked on code base. I found a github with a explicit declaration of some of the functions and objects we'll use, making it easier to understand and utilize them. I've started a PowerPoint to go over openAMP, so that I can better understand it by being able to teach it to someone, and for future use for the client.

Rudolph: Configured various parts of our operating system and hardware to match our design: created reserved memory regions in the operating system, created several new application

projects, one for each processor, and each with a linker file declaring its spot in memory. Continued coding with the OpenAMP framework to finish our interprocessor communication system.

Pending Issues

Sandro P: I'm approaching the hard drive capacity of the VM, will send an e-mail to ETG asking for more hard drive space. Some of the videos in the dataset are roughly 30 mins long, will extract frames from videos that are 2 and half minutes or less to save on space.

Alek C. I will need help learning how to get what version of openAMP is on the board. OpenAMP documentation is vague and scattered all over the place. I may need help coming up with a plan for outlining the APU code base.

Rudolph: None, just pressured by time.

Jeffery K. Create a list of necessary tools that will need to be installed into the petalinux image.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Sandro Panchame	Trimmed down our datasets to what is usable. Used remodnav successfully without the need for the command line. Received the virtual machine from ETG and shared details with the group. Wrote down some functions to help process through large datasets. Extracted frames from videos in the dataset.	8	81
Rudolph Nahra	Configured various parts of our operating system and hardware to match our design: created reserved memory regions in the operating system, created several new application projects, one for each processor, and each with a linker file declaring its spot in memory. Continued coding with the OpenAMP framework to finish our interprocessor communication system.	8	115
Alek	Worked on fleshing out code, started creation of powerpoint of openAMP for better understanding and collaboration.	5	67
Jeffery Kasper	Compiling a petalinux image and creating a Vitis AI project.	10	80

Plans for Coming Weeks

Jeffery K : Begin to implement inter-process communication model inside of Vitis AI project.

Sandro P: Compare the predicted movements against the information in the dataset. From there, the goal is to fine tune parameters in Remodnav for accuracy. Proceed with training on the dataset. Obtain more capacity on the Virtual Machine.

Rudolph: Finish, test, and evaluate interprocessor communication on our board by passing around pointers to memory on the board

Alek C.: I plan on trying to get ahold of the board to match our versions of openAMP. I hope to understand how to get the code onto the board and execute it. I plan on working closely with Jeffery and Rudy to better understand the memory partitioning and what direction to go from there.