

EE / CPRE / SE 492 - sdmay23-47

CyDAQ DSP Platform Firmware and Software Redesign

Bi-Weekly Report 3

March 5, 2023 - March 26, 2023

Client: Matthew Post

Faculty Advisor: Philip Jones

Team Members

Yohan Bopearatchy - Firmware Engineer

Wyatt Duberstein - CLI Engineer

Blake Fisher - GUI Lead

Corbin Kems - CLI Engineer Lead

Cole Langner - Testing Lead

Jens Rasmussen - Project Lead

Long Zeng - Firmware Engineer Lead

Past Period Summary

Before and during spring break a lot of work was done on the firmware side and bug fixes for the GUI. There has been a lot of progress with petalinux and a linux environment for development and debugging. After a few versions of the GUI were sent to Matt and the ETG team, bugs were identified and fixed. A lot of documentation was created and added to the Gitlab wiki.

Past Period Accomplishments

Yohan Bopearatchy

Yohan worked on trying to use petalinux on the zybo z7 as well as fixing shared register problem on dual core.

Wyatt Duberstein

Wyatt worked on Fixing up bugs that were reported to us by our advisor and his team, as well as starting on redoing the balance beam functionality.

Blake Fisher

Blake worked on finalizing questions to ask when we used test our new GUI. Also fixed bugs in the GUI.

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Corbin Kems

Corbin worked on some minor GUI layout changes that should make it much easier to add new content/pages in the future. There is still some cleaning up left to do but it's mostly done now. He also dived more into petalinux research and configuration. This involved creating a few wiki pages to document his findings so others don't have to go through the same process. He learned how to configure the USB drivers using ConfigFS in linux, which makes the USB drivers on petalinux very configurable in the future.

Cole Langner

Cole worked on testing the GUI and writing automated tests for the GUI.

Jens Rasmussen

Jens worked on small things with the GUI, documentation, and a form for the lab feedback.

Long Zeng

Long Worked on updating and finalizing the hardware design; Remaking the petalinux with the new xsa and updated the device tree; Updated the petalinux page on wiki; Made a Hardware page for Vivado on wiki; Started a new page about linux app on Vitis on wiki; Generated a working linux boot drive; Started a new linux environment for vitis debug for linux application.

Pending Issues

Yohan Bopearatchy

Yohan had issues with petalinux not being able to load giving a boot error.

Wyatt Duberstein

Wyatt had issues fixing some of the bugs that came up as some of them were complex and deep in the code. Also struggled with converting the existing MATLAB code for the balance beam mode into python code

Blake Fisher

Blake had issues with coming up with good questions that can create useful feedback from students.

Corbin Kems

Corbin had issues with building Petalinux with the hardware changes Long made. This is going to get smoothed out when we create Linux VM development environments though.

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Cole Langner

Cole had issues with nothing.

Jens Rasmussen

Jens had issues with nothing.

Long Zeng

Long had issues with vitis is not picking up the standard libraries such as stdio.h, needing a way to share my linux image so the rest of the group don't have to go through the set up again.

Individual Contributions

Name	Hours Worked This Period	Cumulative Hours
Yohan Bopearatchy	15	26
Wyatt Duberstein	16	40
Blake Fisher	4	18
Corbin Kems	40	76
Cole Langner	4	11
Jens Rasmussen	3	15
Long Zeng	70	86

Plans For Upcoming Period

Yohan Bopearatchy

Yohan will work on getting petalinux to work on his zybo z7 and start testing the limits of petalinux.

Wyatt Duberstein

Wyatt will work on continuing the balance beam project, making that functionality work in the same window rather than on a separate window like the existing balance beam mode.

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Blake Fisher

Blake will work on designing and implementing new GUI features that we have been planning on doing.

Corbin Kems

Corbin will work on getting a linux development environment setup for petalinux. Once that is done, he will start working on finalizing the petalinux kernel module configuration so both USB drivers work consistently. If all that goes quickly/smoothly, he will help Long port our old firmware applications over to new Petalinux applications on Vitis.

Cole Langner

Cole will work on finishing tests for the GUI and start manual testing the new balance beam mode.

Jens Rasmussen

Jens will work on adding balance beam features to the GUI and/or CLI.

Long Zeng

Long will work on making the linux environment work, and adopting the old c code to the new linux firmware

Summary of Advisor Meetings

During the advisor meetings there was a lot of discussion on petalinux. The focus of these discussions were what it does, how it will be helpful, and how long it will take to implement. It was decided that the petalinux work should continue and it will be beneficial to the project. A few versions of the GUI were sent to Matt and bugs were identified and communicated to the group. The lab testing with EE 224 was pushed back from the week of the 27th to the week of April 10th.