EE / CPRE / SE 492 - sdmay23-47
CyDAQ DSP Platform Firmware and Software Redesign

Bi-Weekly Report 5

April 8, 2023 - April xx, 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

A lot of progress was made during the past period including 10 versions of the GUI and 6 versions of the firmware being built and distributed to the client with a stable version of the new GUI being placed in front of 4 labs of EE224 students. The new GUI had overwhelmingly positive reviews from the students with minor bugs related to performance and feedback about some of the UI features. Many bugs were identified during testing including issues with files being overwritten when Excel still had them open, low number of data points due to interrupts in the wrong place, and minor UI changes. Additional bugs were identified and are currently being worked on such as saving files as .mat and sampling issues most likely due to caching issues.

Past Period Accomplishments

Yohan Bopearatchy

Yohan worked on testing firmware and helped fix any bugs currently happening with the firmware.

Wyatt Duberstein

Wyatt worked on fixing bugs for the GUI for lab testing. Also worked on learning firmware development and getting vitis set up on my computer

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Blake Fisher

Blake worked on designing and implementing the new connection indicator. Also spent time on how to implement the indicator globally while not breaking the layout we currently have.

Corbin Kems

Corbin worked on implementing basic sample mode on the new firmware. This involved transferring sample data between the two CPU cores and writing the data to a COM port and file on the Petalinux system. Corbin also worked on adding GUI support for both firmware (old and new) versions, as well as adding SCP file transfer support, which allows for much higher transfer speeds for sample data. Corbin also fixed a handful of bugs in the GUI.

Cole Langner

Cole worked on fixing bugs for the GUI for lab testing. Also worked on manually testing new versions of the firmware and GUI.

Jens Rasmussen

Jens worked on bug testing the GUI before and during the EE224 lab testing and helped replicate and fix bugs afterwards. He continued working on documentation in the Gitlab wiki.

Long Zeng

Long worked on fixing the XADC hw design problem, switched back to event mode instead of continuous mode, fixing the interrupt issue where the AXI timer and the XADC don’t send out interrupt as a counter. Helping to fix the enable issue on the split-core. Also formatted the firmware output message to COMM> and the bare-metel output to SAMP>, so we know what side did the message is come from.

Pending Issues

Yohan Bopearatchy

Yohan had issues with petalinux randomly crashing on his PC. This might be caused by too much applications running at the same time or personal hardware unable to handle the program.

Wyatt Duberstein

Wyatt had issues with the bugs that I was finding and fixing, as well as getting balance beam to work due to the current design that we use for the balance beam.

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Blake Fisher

Blake had issues with implementing the indicator globally without breaking the way we display different pages. Was ultimately figured out.

Corbin Kems

Corbin had issues with reading sample data on the petalinux side. Sometimes groupings of data don't match what gets written from the sampling CPU. This is most likely a data caching issue, but multiple attempts to disable caching weren't successful.

Cole Langner

Cole had issues with nothing.

Jens Rasmussen

Jens had issues with identifying and replicating bugs in the GUI.

Long Zeng

Long had issues with XADC mode selection, XADC interrupt configuration, interrupt cache not being cleaned.

Individual Contributions

Name	**Hours Worked This Period**	**Cumulative Hours**
Yohan Bopearatchy	10	44
Wyatt Duberstein	x	60
Blake Fisher	10	31
Corbin Kems	40	156
Cole Langner	15	31
Jens Rasmussen	20	40
Long Zeng	30	146

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Plans For Upcoming Period

Yohan Bopearatchy

Yohan will work on documentation, help fix any bugs in the firmware, and fix personal petalunix issue.

Wyatt Duberstein

Wyatt will work on fixing more bugs found during the lab testing on Tuesday, as well as getting the balance beam page more sturdy for the balance beam lab next week

Blake Fisher

Blake will work on creating the the poster and start working on other final related assignments.

Corbin Kems

Corbin will work on fixing the sampling data issue reported above, as well as rounding out any other small pending bugs on the GUI/firmware. He will also finish writing wiki documentation for future teams.

Cole Langner

Cole will work on manually testing the GUI and the new firmware for the upcoming lab testing, as well as working on the final project things.

Jens Rasmussen

Jens will work on code cleanup and refactoring, continuing to work on bug fixing, and creating documentation for the next senior design team tasked with this project.

Long Zeng

Long will work on testing the sampling, improve the current design, and document the new hw design (maybe a video too).

Summary of Advisor Meetings

The group’s meetings with our client / advisor during the past period included a lot of bug testing and conversations about the lab testing. Bugs identified were documented along with replication steps and resolutions if they were found. UI changes were brought up with the client for feedback along with sharing the Google Form answers from EE224 students and TAs. The client emphasized the need for good documentation of the project and mentioned they plan to pitch the project again next semester (or in two semesters) as more of an embedded project to

fully utilize the CyDAQ hardware capabilities. The client mentioned that they are very pleased with the group’s work, especially during the last few weeks or month.