EE/CprE/SE 491
wDAQ System (sddec24-19)
Weekly Report 7

March 20 - March 26, 2024
Clients: Manojit Pramanik and Avishek Das
Faculty Advisor: Manojit Pramanik

TEAM MEMBERS

Adam Shoberg [EE] - Circuit Design & Simulation, PCB Design, Team Communications Leader

Henry Chamberlain [EE] - PCB Design & Construction

Lisa Tordai [SE] - Software Development, Wireless Data Sharing, User Interface

Vaughn Miller [CprE] - Computer Engineering

SUMMARY

This week, we made some significant progress with our RF amplifier and ADC circuits, data logging, and Wi-Fi signal communication. With the low-noise amplifier and ADC, our electrical members made some final changes to the schematics and PCBs upon consulting with our client (Avishek), before exporting Gerber files and Bills of Materials for the PCBs and requesting them to be ordered and soldered by ETG as our initial "prototype" PCBs. As for data logging, our software member made progress with recording, analyzing, and communicating data in LabVIEW using a Wi-Fi connected Arduino board and code. On the computer engineering side of things, our CprE team member worked with sending inputs from the STM32 MCU to the ESP Wi-Fi Module we are using, including configuring clocks and flashing lights on the microcontroller and writing code for the MCU to read synchronous digital inputs from the ADC.

ACCOMPLISHMENTS

Adam:

- Revised LNA schematic & PCB layout in EasyEDA
- Revised ADC circuit schematic & PCB layout in EasyEDA
- Met with client to discuss EasyEDA revisions

Henry:

- Exported Gerber files and BOMs for LNA and ADC PCBs
- Revised BOMs to include specific components and parts available from DigiKey
- Placed order for PCB parts and soldering (one board per circuit) through ETG

Lisa:

- Researched ways LabVIEW allows data to be exported
- Worked to improve LabVIEW VI of interface to remove unnecessary features
- Creating a way for the user to be able to export data into a text file

Vaughn:

- Completed initial setup of our particular STM32 board
- Clocks for PLL and GPIO configured

PENDING ISSUES

Adam:

- Just need to have Boards soldered and evaluated

Henry:

- Unsure about process to order multiple boards to be soldered by JLCPCB through ETG

Lisa:

- Discuss exactly we want the user's exported data to look like
- Implementing export method successfully in LabVIEW

Vaughn:

- Still having issues with printing error messages during runtime, not sure how to approach this other than keep rechecking register values

INDIVIDUAL CONTRIBUTIONS

Member	Contributions	Weekly Hours	Total Hours
Adam	Schematic and PCB revisions for LNA & ADC with client consultation	5	40
Henry	Exporting & revising Gerber files and BOMs for LNA & ADC, ordering PCBs	5	40
Lisa	Updating team website, Research LabVIEW tools, Work on LabVIEW GUI, Learn about formal documentation	5	44
Vaughn	Completed initial setup for STMF4, configured basic peripherals	5	38

COMMENTS AND EXTENDED DISCUSSION

Adam:

- Looking to see how our designs work and need to stay active/flexible if any unforeseen problems arise with our board.

Henry:

- Avishek wants to share as little information as possible with our faculty advisor
- Want to solder some of the PCBs, but this might not be practical with the volume needed

Lisa:

- Discuss formal documentation of our project and create a plan of work to consistently expand the documentation

Vaughn:

- Want to complete the setup for digital reads so that reading an ADC is possible

ACTION ITEMS FOR UPCOMING WEEK

Item	Member(s) Assigned	Desired Completion
Acquire and test PCBs from ETG once soldering is completed	Adam, Henry	4/10/2024
Read inputs/send inputs from STM32 to ESP Wi-Fi Module	Vaughn	4/03/2024
Continue revising Arduino code/LabVIEW data logging	Lisa	4/03/2024
Read through article published by Avishek to get ideas for formal documentation	Lisa, Vaughn, Adam, Henry	3/27/2024
Prepare presentation on March progress for faculty advisor meeting	Lisa, Vaughn, Adam, Henry	3/29/2024

SUMMARY OF WEEKLY MEETINGS

Weekly Client Meeting (3/20):

- Reviewed progress with LNA and ADC schematics & PCBs
- Reviewed progress with data analysis & communication in Arduino & LabVIEW
- Discussed tasks & desired deliverables for 3/27/2024 meeting
    - Make final revisions to schematics & PCBs for LNA & ADC
    - Export Gerber Files and BOMs and order soldered prototype PCBs for LNA & ADC
    - Work further on logging and analyzing data in Arduino & LabVIEW
    - Work on sending inputs from the STM32 MCU to the ESP Wi-Fi Module
    - Read Avishek's published article to understand what goes into an academic paper
    - Create a presentation for Prof. Manojit over March progress for next meeting