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## **EE/CprE/SE 491 WEEKLY REPORT 1**

**1/29/23 – 2/2/23**

**Group number: 20**

**Project title:** Millimeter-Wave Imaging Radar

**Client:** Iowa State University

**Advisor:** Mohammad Tayeb Al Qaseer

### **Team Members/Role:**

Matthew Caron (Build PCB for ADC-DAC, USB)

Michael Levin (Program FPGA for Digital Signal Processing)

Rodrigo Romero (Program FPGA for SPI and control)

Nathan Ayers (PC Interface)

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### **o Weekly Summary**

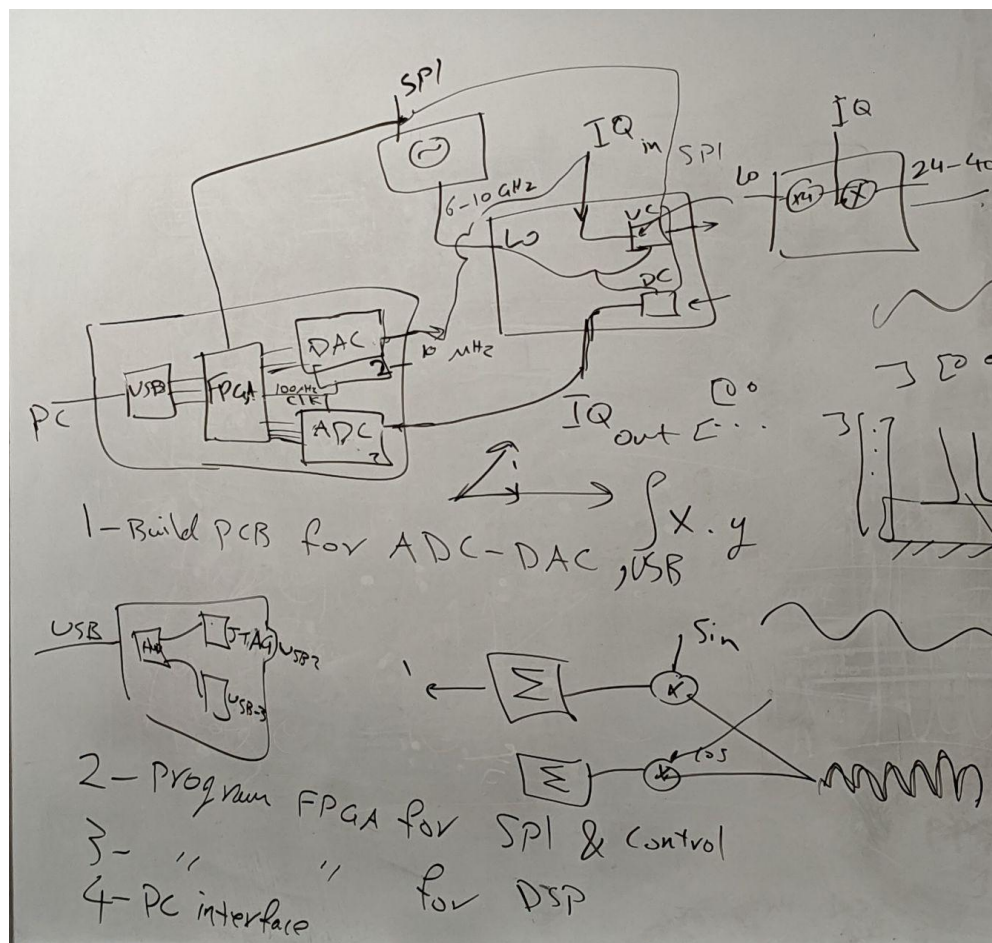
- For our first week, we spent much of our time organizing the team and getting acquainted with our project. On Tuesday, we diagrammed our project with the help of the project management tool 5W and 1H to use it as a jumping off point for familiarizing ourselves with the task as a whole and generating ideas for accomplishing the tasks. We also met with our advisor on Thursday to discuss the details of what we will be doing and what is expected. We split the project into four distinct sections and assigned each of us a section to research and start work on.

### **o Past week accomplishments**

Our main accomplishment this past week was organizing and completing a meeting with our advisor, he drew out a general outline/architecture of our project, we also had the opportunity to ask questions.

#### **Meeting Outcomes:**

- Assigned roles within the group, the roles are PCB design, FPGA programming, Digital Signal Processing protocol, and a PC user interface.
- We received our FPGA from our advisor, allowing team members involved in the FPGA programming to begin practicing with it.
- Our advisor showed us some of the resources that we will have access to in the Center for Nondestructive Evaluation for physical testing.
- We were also given advice on software to use for FPGA programming and for the PC programming that will take place as well.



Shown above is a drawing given to us by our advisor, it includes components that have already been built, and ones that need to be built and integrated into the pre-existing components. Our objective is to build a PCB with 2 DAC's and 2 ADC's, this allows for two signals to be output at one time, and to be returned, the FPGA will create a signal that will be converted to analog, and a signal will be returned through the ADC and then digitally processed by the FPGA and sent through USB to the PC, where the data can be assessed. With four group members and four tasks, we each have a component we are responsible for, but we will work together on individual tasks.

#### Tasks include:

1. Build PCB for ADC-DAC.
2. Program FPGA for SPI & Control
3. Program FPGA for DSP
4. PC interface

#### Work Completed:

All group members:

- Met with Advisor
- Discussed collaboration on individual tasks
- Began experimenting with software, and hardware components that will be utilized.

### **Pending issues**

- We all have very busy and conflicting schedules so finding times to meet was a struggle. We were able to find a time and place to come together and discuss what progress we've made individually and hopefully we will find more time as the semester progresses to work together on the project.

o **Individual contributions**

<b><u>NAME</u></b>	<b><u>Individual Contributions</u></b> <i>(Quick list of contributions. This should be short.)</i>	<b><u>Hours this week</u></b>	<b><u>HOURS cumulative</u></b>
Matthew	communicate with team and client to schedule meetings	2	2
Nathan	Past week accomplishments, nothing technical yet.	2	2
Michael	helping to delineate tasks between the four of us.	2	2
Rodrigo	Notes taken during the meeting, and during class.	2	2

o **Comments and extended discussion**

- We have discussed that scheduling has been an issue previously, as we have busy schedules, but we anticipate the issue to go away as we have found a time that works for advisor meetings and we are mostly comfortable with meeting later at night during weekdays.

o **Plans for the upcoming week**

- Nathan: Discuss with advisor/team in more detail about the coding environment that will be used for the PC interface. I will also need to do independent research on communication with USB ports. Need to setup a regular meeting date.
- Rodrigo: Start to work with the FPGA board to probe that it works appropriately.
- Matthew: start to research which components would be best to use in the design

o **Summary of weekly advisor meeting**

- Client/Advisor explained the project in a general form taking care of the details that we will be involved in. The project was split in four main sessions to start to work on. Every member of the team will be on charge of one subject, but still everyone will be involved in the project. We were told by our advisor that there are some parts of the project that we already have, and the parts that we do not have yet. It was agreed that biweekly meetings will be conducted on Thursdays 3:00 pm to 4:00 pm. Depending on the help needed it can be weekly.