

Group number: 18

Project title: Radio Frequency Readout Device (RFRD)

Client &/Advisor: Dr. Qiao

Team Members/Role: Brandon Baxter/Team Leader, Vaughn Dorsey/Team Webmaster, Luke Myers/Team Communication Leader, Kurt Turner/Team Key Concept Holder, Aaron Haywood, Robert Buckley, Mehdy Faik, Kellen Yoder, Michael Miller

o Weekly Summary

Now that we are entering February, Dr. Qiao wanted to discuss a number of aspects of our project at our weekly meeting to gather a better idea of where we are currently at and what steps we need to be taking. We spent most of the time discussing our IC prototype. For next week, he wanted to see an update on the current states of the user interface, the reader, and the antenna. He also wanted us to begin work on a printed circuit board design of our IC. On Sunday, February 5 we met as a group to discuss our progress and have members from the different groups touch base.

o Past week accomplishments

- Brandon Baxter: Helped find parts so that the PCB could begin its design
- Vaughn Dorsey: Worked with ETG to get a Windows 10 VM so that work could begin on the back-end components of the software. Also continued working on what the UI should look like.
- Luke Myers: I began simulation work on a modulator and demodulator design for transmitting the message signal containing the tag ID and capacitance measurement from the tag back to the reader.
- Kurt Turner: IC Prototype testing and tuning.
- Aaron Haywood: Oscillator tweaking and amplifier work
- Robert Buckley: created IC schematic of shift register. Started testing power requirement.
- Mehdy Faik: Initial investigation into proper execution of rectifier layout.
- Kellen Yoder: Met with the Reader team members, figured out where we are currently at as well as what we need to do moving forward. Looked over some things with Robert, and researched parts to order for our circuit.

- Michael Miller:

O Pending issues

- Brandon Baxter:
- Vaughn Dorsey: Need to nail down the UI design and figure out what all the UI needs to do.
- Luke Myers:
- Kurt Turner: Noise
- Aaron Haywood: Oscillator still needs a working amplifier.
- Robert Buckley: Schematic done, but the layout is writing me if we can't get encounter working.
- Mehdy Faik: Figure out Eagle. Make layout work.
- Kellen Yoder:
- Michael Miller:

O Individual contributions

| <u>NAME</u> | <u>Individual Contributions</u> | <u>Hours this week</u> | <u>HOURS cumulative</u> |
|--------------------|---|---------------------------------------|------------------------------------|
| Brandon Baxter | Group meetings and Professor meetings Parts research | 4 | 9 |
| Vaughn Dorsey | Setting up things on the new server, including SQL Server and IIS, for back-end development Meetings with team and advisor UI Development | 4.5 | 11.5 |
| Luke Myers | Conducted simulation work on a modulator and demodulator design in Simulink. | 4 | 12.5 |
| Kurt Turner | IC tuning | 4 | 13 |
| Aaron Haywood | tested op-amp with oscillator worked on new design | 3 | 10 |

| | | | |
|----------------|--|---|-------|
| Robert Buckley | Created shift register schematic in cadence | 9 | 22 |
| Mehdy Faik | Meetings, getting Eagle | 2 | 26.25 |
| Kellen Yoder | Meeting with advisor Reader team current state Troubleshooting and parts | 6 | 11 |
| Michael Miller | | | |

o Comments and extended discussion

o Plan for coming week

- Brandon Baxter: Worked on...
- Vaughn Dorsey:
- Luke Myers: Continue to work on Simulink to develop the modulator and demodulator for our system.
- Kurt Turner: Work on oscillator to be able to use it for IC testing.
- Aaron Haywood: Finish amplifier design and test, make a filter for the demodulator
- Robert Buckley: connect shift register to sensor. Test power requirement of circuit.
- Mehdy Faik:
- Kellen Yoder: Make progress on reader needs, plan for PCB
- Michael Miller:

o Summary of weekly advisor meeting

1/31/17

Dr. Qiao came with a number of things that he wanted to address with us. He asked about the frequency we are operating at in order to obtain the wireless feature. We discussed the problems we are encountering at 13.56 MHz and how those problems will only be amplified if we were to switch to 928 MHz.

We discussed the possibility of purchasing an IC chip. The biggest issue is that this would require the

use of a microcontroller to convert the signal from digital to analog. With our discrete component prototype we are currently outputting an analog signal.

We discussed current state of our project- what has been programmed in cadence, research into EEPROM, and where we are at with the IC prototype.

Dr. Qiao thinks we should go ahead with designing a PCB for our tag in Multi-Sim and ordering it.

We went through a written report from Mehdy (who was unable to attend the meeting) detailing what he has accomplished over the past week.

Next week we want to see more progress from the Reader and User Interface sides. We should make sure that Mehdy is here. We should also start some progress for the PCB.