

EE/CprE/SE 491 WEEKLY REPORT 09

11/6/17 – 11/10/17

Group number: 11

Project title: RFRD Phase II

Client &/Advisor: Dr. Daji Qiao and Dr. Nathan Neihart

Team Members/Role:

Bailey Akers - Facilitator/RFRD Tag Design/Fabrication Engineer

Colin Sunderman - RFRD Tag Design/Fabrication Engineer

Lyle Bishop - Principal Antenna Engineer

Pengyu Qu – Antenna/Power Harvesting Engineer

Nathan Mulbrook - RFRD Wireless Communications Engineer

o Past week accomplishments

Team Member 1: Bailey Akers

Simulated non-inverting amp, comparator, and integrator to attempt to resolve errors with relaxation oscillator simulations. Generated weekly report.

Team Member 2: Colin Sunderman

Simulated non-inverting amp, comparator, and integrator to attempt to resolve errors with relaxation oscillator simulations.

Team Member 3: Pengyu Qu

Researched what type of antenna should be used for this project.

Team Member 4: Lyle Bishop

Researched what type of antenna should be used for this project.

Team Member 5: Nathan Mulbrook

Continued research into software-controlled radio and using it for testing RFRD.

o Weekly Summary

11/8 - Colin Sunderman and Bailey Akers simulated the relaxation oscillator circuit and attempted to discover why it wasn't working as expected. They attempted to use op amps with higher gain-bandwidth product and better slew rate and changed resistor values to improve the output of the comparator. Concluded that while this led to better looking outputs there was no noticeable change in the period of the pulses for different capacitors

11/8 - Pengyu Qu and Lyle Bishop met to simulate the inverted-F antenna in Momentum.

Nathan Mulbrook throughout the week researched using a software defined radio program for the testing stages of this project.

11/3 - Met with advisor Dr. Nathan Neihart.

- Bailey Akers and Colin Sunderman presented on the SPICE simulations and problems with the period of the relaxation oscillator circuit output
 - Neihart suggested researching more into what factors could be causing the period to not be the expected value
 - Also suggested plotting the currents of the circuit to help find the problem
- Pengyu Qu presented on the antenna that they simulated in Momentum
 - Neihart made suggestions on how to correct some errors with the antenna and to complete the design

This Week:

NAME	Individual Contributions Summary	Hours This Week	Hours Cumulative
Bailey Akers	SPICE simulations.	4	51
Colin Sunderman	SPICE simulations. Generated weekly report.	5	46
Pengyu Qu	Designed antenna in Momentum.	6	43
Lyle Bishop	Designed antenna in Momentum.	7	44
Nathan Mulbrook	Research software defined radio program for testing.	5	41

***Details of weekly contributions are noted in above Weekly Summary section.**

o Plan for coming week

Goals for next week's advisor meeting (11/10): Details also listed in Weekly Summary section.

Capacitive Sensing Circuit Design: Colin Sunderman and Bailey Akers

- Figure out issues with relaxation oscillator simulation.

Antenna Design: Pengyu Qu and Lyle Bishop

- Finish simulating an antenna using Momentum software.

Communications, Tx/Rx Module: Nathan Mulbrook

- Further research into implementation software defined radio program.

o Team Difficulties

The main difficulties were with the relaxation oscillator SPICE design and Momentum antenna design. More research will be done to solve simulation issues. More work and research needs to be done to complete the Momentum antenna design.

Grading criteria

Each weekly report is worth 10 points. Scores will be awarded as follows:

- 8 – 10: Progress for your project seems to be suitable. Documentation and hours reported by team members are adequate.
- 6 – 8: There is scope of improvement both in your report and your project progress. Can consult with instructor/TA after class for further inputs.
- < 6: Please talk to instructors/TA after class hours about any difficulties that you/your team is facing.