EE/CprE/SE 491 WEEKLY REPORT 04

10/4/2024 – 10/10/2024

number: 36

Project title: ***Ultrasonic Object Detector***

Client &/Advisor: Professor Jiming Song

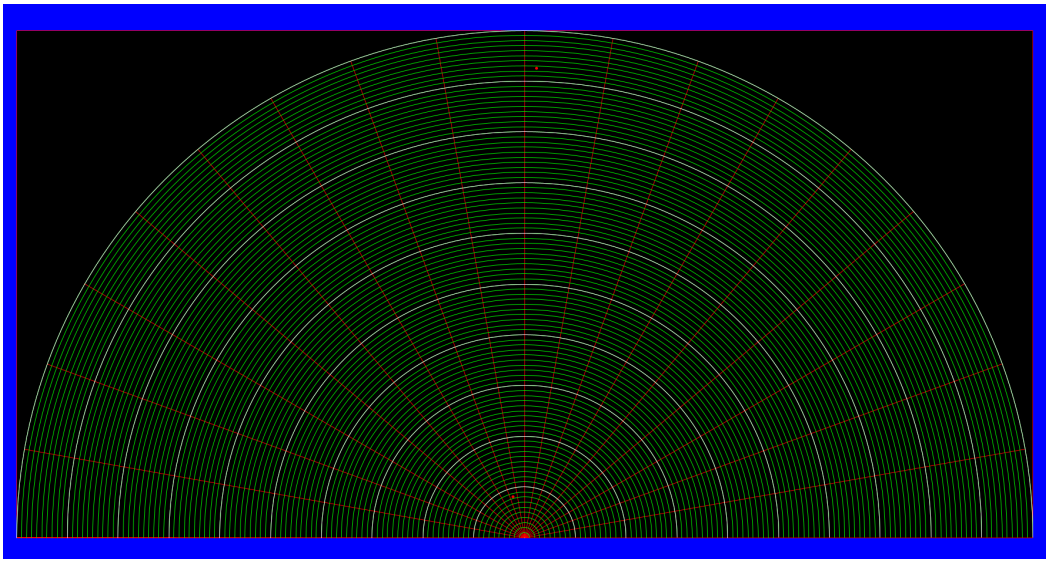
Team Members/Role:
Nathaniel Clarke - Project Software Designer
Brock Dykhuis - Circuit Analysist
Nicholas Jacobs - Electronics
Jonathon Madden - UI Designer & Software Tester

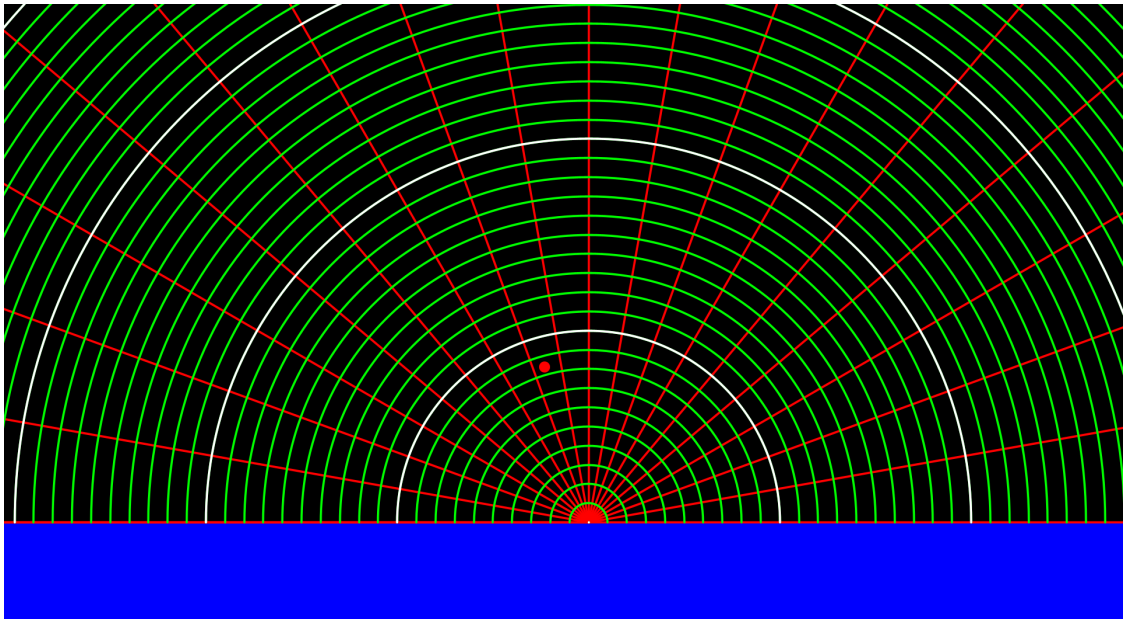
Weekly Summary

This week consisted mostly in continued research into components, and further refinement of our options. We continued to add to a spreadsheet with transducer options, and compare our options. We were given more guidance on what features to look for in a transmitter. Software implementation continues to be experimentation until official hardware specifications have been decided. After searching for more transducer options, we are now looking into using MA40S4S/R transducers, which will meet our newly recommended conditions.

Past week accomplishments

- Worked with PDE sketch to make a potential background - **Nathaniel Clarke**
    - Attempted to get experience with pde functions
    - May prove better to html due to scale, and quick updates to display, further experimentation needed.
    - Allows for panning and zooming.





- Searched for additional transmitter options smaller than 16mm - **Nathaniel Clarke**
    - Found two options that are 10mm, and one that is 14mm and can function as a receiver as well.
    - MA40S4S appears to be the most viable option.

- Setup a simple web server using a raspberry pi - **Brock Dykhuis**
    - works by typing the ip address into a search bar
    - currently just displays simple html from a file
- Work on slides for the lightning talk next week - **Brock Dykhuis**
    - setup a theme that looks nice and professional

- Work on “requirements” slides for the lightning talk next week - **Nicholas Jacobs**
    - Worked on Requirements and Engineering Standards slide
- Simulations - **Nicholas Jacobs**
    - Ran simulations with the new transducer to test performance and gather data
- Schematic Design - **Nicholas Jacobs**

    - Began developing the overall schematic for the circuit, integrating components for the project
- Presentation slides - **Jonathan Madden**
    - Worked on the powerpoint for user needs and requirements
- Experimented with a mock display on html canvas - **Jonathon Madden**
    - Began trying to create a mock display on html canvas based on past groups work

Individual contributions

NAME	Individual Contributions	Hours this week	HOURS cumulative
Nathaniel Clarke	Worked with pde to get used to the environment making a sample display background. Added documents to the team webpage. Continued transmitter research.	6	27
Brock Dykhuis	Worked with the raspberry pi to setup a simple web server	6	22
Jonathon Madden	Worked on slides for our groups lightning talk, experimented with ways to create a display for the radar	6	20
Nicholas Jacobs	Prepared slides for the lightning talk, ran transducer simulations and began schematic design.	5	23

Comments and extended discussion

Currently we are considering using MA40S4S/R transducers for radar transmitters and receivers, and we are looking for further approval.

Plans for the upcoming week

Nathaniel Clarke: Continuing testing for radar display, will try to determine a way to zoom and pan for HTML canvas.

Jonathon Madden: Continue experimenting with a mock display

Brock Dykhuis: Continue working with the raspberry pi, setup simple get/pull requests to transfer data

Nicholas Jacobs: Continue developing and refining the overall schematic for the project. Run additional simulations to fine-tune the transducer's performance and test any adjustments. Practice lightning talk to ensure clear delivery.

Summary of weekly advisor meeting

During this week's advisor meeting our client was shown our list of potential transmitters and receivers. It was determined TCT40-16R/T to be the preferred option from our previous choices. We are still expected to look for better options, specifically to look for a transmitter closer to 10mm in diameter. It was discussed that smaller transmitters tend to equate to a larger field of view (directivity). After finding a new option we should seek further approval. It was discussed that next weeks meeting will be canceled due to a scheduling conflict.