EE / CprE / SE 492 – sdmay23-22

Ultrasonic Radar

Week 4 Report

March 24th – April 7th
Client & Faculty Advisor: Jiming Song

Team Members:

Kevin Czerwinski - Electrical Engineer
Derek Thomas - Computer Engineer
Ryan Foster - Electrical Engineer
Samuel Rosette - Electrical Engineer
Jack Riley - Electrical Engineer
Abubaker Abdelrahman - Electrical Engineer

Past Week (s) Accomplishments

- We have made further progress and improvements to both amplification circuits for the receivers and transmitters. The goal is to clean up the signals so that the data read in at the arduino is as accurate as possible.
- We have also begun creating the pcb board design on Kicad as we are finalizing the different parts we will need.
- Throughout testing we realized that a negative reference voltage might be required for a cleaner signal at the receiver input which either will be included as a negative voltage regulator or will just be skipped and a noisier signal will be used.
- We have put in a lot of research into the kind of code that will be required to create the phase shifting that is required for our array. This has allowed us to begin writing code for our project before having a functioning PCB. The code is basic so far but we are moving slowly to avoid errors and give us a basis to work off of once the PCB is developed.
- We plan on completing and ordering the PCB by next week.

Pending Issues

- We still are having issues with the code which will need to be further developed in the future. This should not be too much of an issue once we have the entire array set up with properly functioning circuits as our current prototype is breadboarded with a bunch of different components that, at points in time, tamper with each other making it a bit difficult to test.
- Another issue we are having is the design of the entire radar. We are in the planning phase for how the components should be set up in the 3D printed case we plan on creating in the future. This is something that needs to be completed sooner or later

because the design of the PCB is going to have to work well with the 3D printed case.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Derek Thomas	- Updated website - Contributed to the bi-weekly report - Attended meetings and figured out possible next steps to tackle phase array	3	21
Kevin Czerwinski	- Developed code for transmission circuitry and phase array. - Helped test and improve amplification circuitry - Contributed to the weekly report	3	24
Ryan Foster	- Testing of amplification circuitry (Input and Output) - Transducer testing - Input manipulation (allows for input to be received by the Arduino) - Developed code for data processing	3	15
Samuel Rosette	- Researched for more accurate transducers - Assisted with the testing of the amplification circuitry(input and output)	3	15
Jack Riley	- Started PCB design - Started case modeling	4	22
Abubaker Abdelrahman	- Attended this week and past week meeting - Researched for ideas to put on the circuit design - Met with the client and figured out using amplifiers in Arduino input.	2	20

Plans for Coming Week
- Further develop code and circuitry.
- Complete the PCB design and order all required components.

- Finalize 3D modeled case and overall design of prototype.