Ethics and Professional Responsibility

Ultrasonic Object Detector
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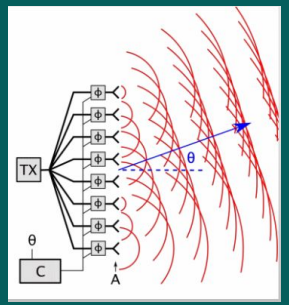
- Brock Dykhuis
- Nate Clarke
- Nicholas Jacobs
- Jonathon Madden

Advisor/Client:
Professor Song

Project Overview

- Design an ultrasonic radar



- Array of transducers
- Rely on reflected sound waves to determine object distance
- Use of time-delay (phase) to control scanning direction and location

Problem Statement

- Design an Ultrasonic Radar System which can detect small objects
- Accurately detect two side-by-side objects
- Effectively convey an image through the use of an intuitive display

Ideal that our team is performing well:

- Financial
  - We pick our parts based on price, we go based on what will work and is the cheapest.
  - The total cost of components currently is $69.79
  - We will handle the components with responsibility to avoid additional costs

Ideal that our team is not performing well:

- **Health, Safety, and Wellbeing**
  - High db from the transducers.
    - Has an output of 120db, this can cause hearing loss and can hurt animals.
    - To help solve this issue we will undervolt the transducers to reduce the sound intensity.
    - We will provide a warning to not stand too close to the device, and to use ear protection if the voltage is set to its max value.

Principles Chart

	Beneficence	Nonmaleficence	Respect for Autonomy	Justice
Public health, safety, and welfare	Detects objects a meter away, and provides a learning to a theoretical user.	None	Provides users with reliable data, a user change the voltage to reduce sound intensity	None
Global, cultural, and social	Contributes to small scale Applications	Avoids harm to global practices	Purchasing this device is optional, so its use it not forced	None
Environmental	Could be used in environmental friendly applications	Minimal environmental harm by using low power components	None	None
Economic	Provides a cost-effective solution for object detection in small-scale systems	The device should be reliable, parts should not be easily damaged	Allows scalability with use in budget friendly applications	None

Ethical Principles

- Concerned
  - Economical
    - Our client was explicit, he wanted our parts to be affordable.
- Not concerned
  - Justice
    - If the user is unable to use the product, we will not make accommodations.

Important Principle Area: Economic

We are specifically focused on the Beneficence and Respect for Autonomy for the Economic Area

- Beneficence
  - This project will provide a low cost solution
- Respect for Autonomy
  - The flexibility of the design allows users to adapt the system for different use cases, offering scalability while staying budget-friendly.

Questions?