Problem and Users

Ultrasonic Object Detector

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Project Overview

- Designing a ultrasonic radar system for detecting small objects.
- Array of transducers provide wave signals to be measured by a receiver.
- Rely on reflected sound waves to determine object distance.
- Use of time-delay (phase) to control scanning direction and location.

Problem Statement

- We need design a Ultrasonic Radar System which will detect small objects.
- It will need to accurately detect two side-by-side objects, and objects in front of one another.
- The radar system must effectively convey its image through the use of an intuitive display.

Group Members (Designers)

Needs

- A learning opportunity relating to their respective fields
- An overall understanding of ultrasonic detection
- Designing a consistent ultrasonic radar device

Wants

- Design an easy to run and responsive radar display
- Improve upon past design, keeping major design decisions

Client

Needs

- Easy to understand display, and interactive display
- A Low cost system
- Use of phase array for clear detection

Wants

- Detection of objects in close proximity
- Improvement from a previous design

Theoretical Purchaser

Needs

- A product that is easy to understand and setup
- Clear product documentation
- Software that is adaptable to various devices (easy to deploy)

Wants

- A learning experience tailored to users with moderate experience with technology

Constraints

- Low cost for components
- Objects in close proximity should be distinguishable
- Clear documentation
- Detect objects at least 1 meter away
- 10 transmitters and 1 receiver transducer in a phase array

Conclusions

Questions?

Suggestions?