Product Research

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

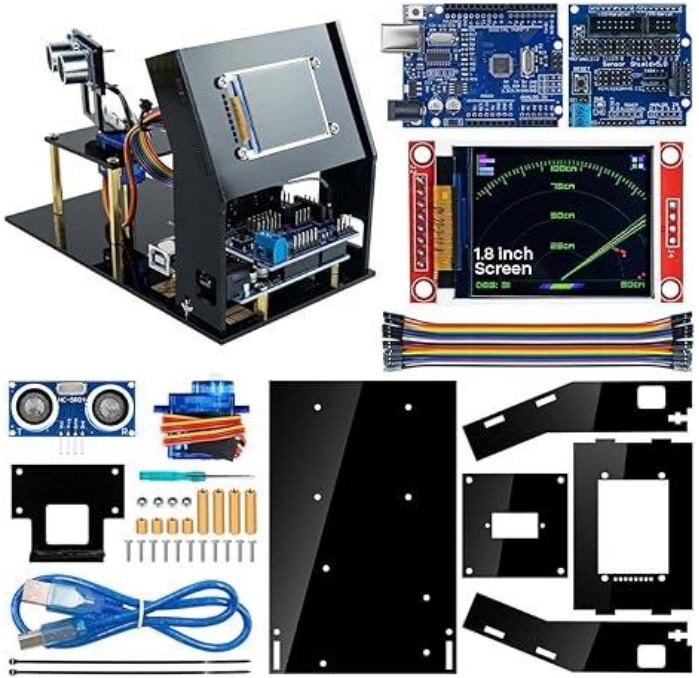
- We need design a Ultrasonic Radar System which will detect small objects.
- It will need to accurately detect two side-by-side objects, and objects in front of one another.
- The radar system must effectively convey its image through the use of an intuitive display.

Similar Products: Baumer proximity sensor

- Has fast response time under (50ms)
- Good build quality
- Highly adaptable to changing temperatures
- Very expensive ($395)
- Relatively short range (1m)

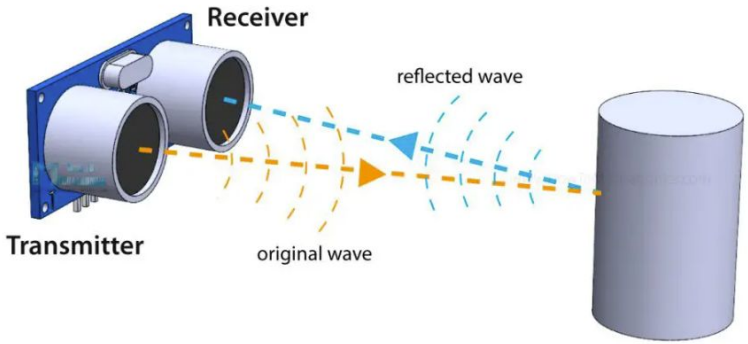
Similar Product: LAFVIN Simulation Ultrasonic Radar Sensor Module DIY Kit

- Easy to Assemble Kit
- Inexpensive ($21.99)
- Range of only 1m
- Difficult set-up software
- Lacking in quality of components
- Built-in Display



Similar Product: Ultrasonic sensor HC-SR04

- Not standalone (connects to Raspberry PI)
- Range of up to 13ft (~4m)
- Very cheap, but requires additional hardware



Similar Product: Uniden - R8 Radar Detector

- Very extensive range
- Very Costly at ($700)
- High customizability
- Non-intuitive Display

Market Gap

- Complexity
  - Some designs are difficult to setup and do not have the best instructions
- Cost
  - Nicer products are expensive
- Interface
  - Clear easy to use displays

New Ideas & Conclusions

- Raspberry Pi
  - Send radar data wirelessly through a raspberry pi
- Improved Display
  - Make improvements on the display, so the object is able to be seen more clearly
  - Outlining and labeling potential objects by collecting points in close proximity
  - Improved precision (down to mm)