

# Object Detection Radar System

## Abstract

This project implements a cost-effective 2D ultrasonic radar using an Arduino Uno, HC-SR04 sensor and m

## Key Components

- Arduino Uno
- HC-SR04 Ultrasonic Sensor
- SG90 Microservo
- Processing (PC Software)
- 5V Power Supply

## Working Principle

At each sweep angle the Arduino triggers the ultrasonic module, measures the echo time, converts it to distance

## Results & Observations

System successfully detects objects within 4m with  $\pm 1$ cm accuracy. Sweep rate is 4Hz at 1° resolution. Da

## Future Enhancements

- Add multiple sensors for 360° coverage
- Use Bluetooth to make the unit wireless
- Integrate machine learning to classify obstacle types