

Arduino Ultrasonic Radar System

Project Description:

The Arduino Ultrasonic Radar System is a DIY radar simulation project that uses an ultrasonic sensor (HC-SR04) mounted on a servo motor to scan an area and detect objects by measuring distances in real time. The entire setup is controlled by an Arduino UNO, and data is sent via the serial port for further visualization and analysis.

This system emulates the sweeping mechanism of a radar, scanning from 15° to 165° and back, logging distances at each angle. The project can serve as a foundation for more advanced robotics, automation, and object detection systems.

Features:

- Real-time obstacle detection using HC-SR04
- Servo-controlled scanning from 15° to 165°
- Continuous sweep and distance measurement
- Serial output for data visualization
- Ideal for object tracking and monitoring systems

Recent Updates:

- Added smooth sweeping motion for better accuracy.
- Optimized delay for real-time response.
- Improved code modularity with `calculateDistance()` function.
- Refactored Serial output formatting for Processing IDE compatibility.

Applications:

- Robotics and automation
- Object detection systems

- Basic surveillance projects
- Distance tracking and mapping
- Educational demonstrations

Conclusion:

This radar system project offers an excellent entry point into the world of sensor-based electronics and automation. It provides hands-on experience in working with ultrasonic sensors, servo motors, and Arduino coding. With further development, it can be expanded into a full-fledged robotic eye or integrated with mapping software for terrain analysis.