NITTE EDUCATION TRUST | N.M.A.M. INSTITUTE OF TECHNOLOGY
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## Department of Electronics and Communication Engineering

**Microprocessor and Microcontroller Application Lab. (19EC507)**

# Ultrasonic Rangefinder using 8051 Microcontroller

**By**

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**Abstract**:

- In this project, we have built an Ultrasonic Rangefinder using 8051 Microcontroller and Ultrasonic Sensor. We have different ways to measure the distance. One way is to use Ultrasonic Sensor for distance measurement. This ultrasonic rangefinder can measure distances up to 4 meters at an accuracy of 3mm. AT89s51 microcontroller,ultrasonic transducer module HC-SR04 and 3 common anode 7 segment display forms the basis of this circuit. The ultrasonic module sends a signal to the object, then picks up its echo and outputs a waveform whose time period is proportional to the distance. The microcontroller accepts this signal, performs necessary processing and displays the corresponding distance on the 3 digit seven segment display. This circuit finds a lot of application in automotive parking sensors, obstacle warning systems, terrain monitoring robots, industrial distance measurements etc.

- In distance measurement-Ultrasonic sensors use high-frequency sound waves that are above the upper limit of human hearing and can transverse through different mediums (which affect the speed of sound) to determine where an object is relative to the point of the transducer. The time it takes for the emitted sound wave to reflect back to the transducer is multiplied by the speed of sound and divided by two for an accurate distance measurement.
- In Terrain monitoring robots -An object that comes within 15 cm of the mower should be recognized as a threat, and the system should instruct the robotic lawn mower to change directions and find an unblocked path.

**Objective of the Ultrasonic Rangefinder using 8051 Microcontroller :**

1.Used for Distance measurement.

2.Can sense slow-moving or stationary objects when driving at low speed and this will provide warning of impending collision.

3. They are ideal for projects involving navigation, object avoidance, and home security. Because they use sound to measure distance ,they work just as well in the dark as they do in light.

4. An object that comes within 15 cm of the mower should be recognized as a threat, and the system should instruct the robotic lawn mower to change directions and find an unblocked path.

Title and objectives are approved by

(Signature)

Name :

Designation :

**Remarks if any by External Examiners during SEE**

| | Name | Signature |
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| Examiner 1 | | |
| Examiner 2 | | |