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**DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING**

**T.E. (E&TC) - 2020-2021**

**PROJECT SYNOPSIS ON**

**“A SHORT RANGE RADAR SYSTEM USING 8051 MICROCONTROLLER ”**

**Submitted by**

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Introduction

The term radar was coined in 1940 by the United States Navy as an acronym for Radio Detection And Ranging. Radar is an object-detection system that uses radio waves to determine the range, angle, or velocity of objects. It can be used to detect aircraft, ships, spacecraft, guided missiles motor vehicles, weather information, and terrain information. A radar system consists of a transmitter producing electromagnetic waves in the radio or microwaves domain, a transmitting antenna, a receiving antenna. Radio waves (pulsed or continuous) from the transmitter reflect of the object and return to the receiver, giving information about the object's location and speed.

The main components in any Ultrasonic radar are the Ultrasonic Sensors. Ultrasonic sensors work on a principle similar to RADAR. Ultrasonic sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor. Sensors calculate the time interval between sending the signal and receiving the echo to determine the distance to an object.

Literature Survey

The ultrasonic sensor is used to map the distance of the things surrounding the point of reference, which is the place where the sensor is placed. This project is used for radar applications. The measured distance is plotted in planner graph i.e. distance v/s angle from servo motor, which give us the map containing the distance at which objects are placed near the sensor. The plot is actually two dimensional, because the distance measured is planner, which is the distance from sensor but not the altitude of the object from ground level. The graph is plotted 3 times, and in case if there is any change in the previous position, it will be indicated which means there is some disturbance or that there is new object before the sensor Arduino IDE sends data, which is distance from sensor and angle of the stepper motor to processing IDE, which is then plotted and we get the planar map of distance from sensor to the objects which are placed around It.Test distance high level time x velocity of sound( 340M/SI/2).

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| Sr.No. | Year | Name of paper | Name of author | Review |
| 1. | June 2011 | Frequency-agile non-coherent ultrasound radar for collection of micro-Doppler signatures | Balleri, K. Woodbridge | Here, Ultrasonic Sensors is used to control the range and parameters and provides better control and accuracy . |
| 2. | May 2009 | Ultrasound System Considerations and their Impact on Front-End Components | Brunner Eberhard and Analog Devices | This work present an event based control technique and its combination with Synthetic Array Radar (SAR) ultra sound and is really very similar to a radar or sonar system |
| 3. | June 2018 | Space and frequency diversity for moving personnel spectrogram estimation | P. Sammartino, J. Fortuny-Guash, | The frequency diverse array (FDA) and conventional phased-array (CPA) radar use to complete wide-area search and detection |
| 4. | June 2013 | Radar System Using Arduino And Ultrasonic Sensors | Shreyes Mehta, Shashank Tiwari | In this system they reduces power consumption and connect programmer to wide range by using Arduino |

Motivation

It can work in any adverse conditions. It has higher sensing distance. Ultrasonic sensors can easily interface with Microcontroller or any type of controller. These sensors are easy to use, not dangerous during operation for nearby objects, person, equipment or material 13 A

Problem Statement

To create a Short Range Radar system using 8051 Microcontroller to used for target detection, target recognition.

Objective

1. To simulate a circuit for the SRS system using proteus.
2. PCB fabricating, mounting and soldering .
3. Analysis of target detection, target recognition by SRS .

Block Diagram

LCD Display

Microcontroller

Ultrasonic Sensor

Buzzer

Servo Motor Servo Motor

Motor

LED

Power Supply

It consists of 4 major parts

1. 8051 Microcontroller

2. Ultrasonic Sensor

3. Buzzer.

4. Servo Motor.

8051 Microcontroller**:** The model number of microcontroller is 78E052D it’s 8 bit and its operating voltage is 5v its have 256 bytes ram and 8kb rom with 12MHZ frequency

Ultrasonic Radar**:** This is a ultrasonic sensor consist of 4 pin , model number is HC-SR04 its range from 2cm to 400cm its operate on 5v and 40HZ frequency

Servo Motor : A servomotor is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration.

Buzzer : - A buzzer or beeper is an audio signalling device it consist of 2 pin VCC and GND with 5V operating vtg.

Conclusion

Ultrasonic Radar Using Micro-controller was successfully implemented and executed. Designed project can able to detect the object and also gives audio signalling if any object is detected within the 15cm range. The range can be adjustable up-to the 100cm range.

Reference

1. Frequency-agile non-coherent ultrasound radar for collection of micro-Doppler signatures, By: Balleri, K. Woodbridge, June 2011
2. Ultrasound System Considerations and their Impact on Front-End Components, By: Brunner Eberhard, May 2009
3. Space and frequency diversity for moving personnel spectrogram estimation By: P. Sammartino, J. Fortuny-Guash, June 2018
4. Radar System Using Arduino And Ultrasonic Sensors By Shreyes Mehta, Shashank Tiwari, June 2013