

Tactical and Acoustic Radar System

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ABSTRACT

RADAR is an object detection system which uses radio waves to determine the range, altitude, direction, or speed of objects. RADAR systems come in a variety of sizes and have different performance specifications. Some RADAR systems are used for air-traffic control at airports and others are used for long range surveillance and early-warning systems. A RADAR system is the heart of a missile guidance system. In tactical and acoustic radar system, we detect the objects in the surrounding area and further measure the distance and angle of the same from our radar system.

Also capture image of the same using pi camera and sends it to the authorized user's mail. Our project is can be simply called as a monitoring or early-warning system which are specialized for securing our borders of our country, basically for military purpose.

Keywords –Radar system, Surveillance and early-warning system.

1. INTRODUCTION

[1] Passive Radar systems present a novel approach to airspace surveillance. They use the target illumination by third-party transmitters, e.g. FM radio or TV broadcast stations, for air target detection and localization. Due to the great number and wide frequency spacing of available transmitters the resulting multistatic and multiband illumination of air targets can be used to reliably obtain a wide-area air picture and to improve detection and tracking performance especially for low observable Air targets. [2]At the radar systems, traditional target tracking, Algorithms are based on the radar measurements termed as plots. In this paper we consider a plot as a vector, which contains measurements of azimuth angle, slant range and sometimes elevation angle. These data are quite sufficient to estimate the target position. Direction finder is a device, which measure only azimuth angle termed as bearing; bearings is considered as another imported source of information nonetheless traditional tracking algorithms based on the plots. This work presents the concept of uniform using plots and bearings as sources of information for tracking systems.

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rooms. In tactical and acoustic radar system, we detect the objects in the surrounding area and further measure the distance and angle of the same from our radar system.

2. PROPOSED WORK

The ultrasonic sensor senses the obstacles or objects that comes in front of its range and sends a signal to the Arduino Uno board. If the object is detected in the enemy boundary, then the image of the same is captured by the pi camera operated by raspberry pi which we have programmed it to do. An LCD board is connected to the Arduino Uno board where we can display the distance and angle at which the object approaches in the area of vicinity. We use a Raspberry pi board (similar to an operating system and all the computer components are embedded on a single board) with a camera connected to it. The camera is used to take a picture of the object detected by the ultrasonic sensor and send it to the authorized mail address through Wi-Fi.

2.1 BLOCK DIAGRAM

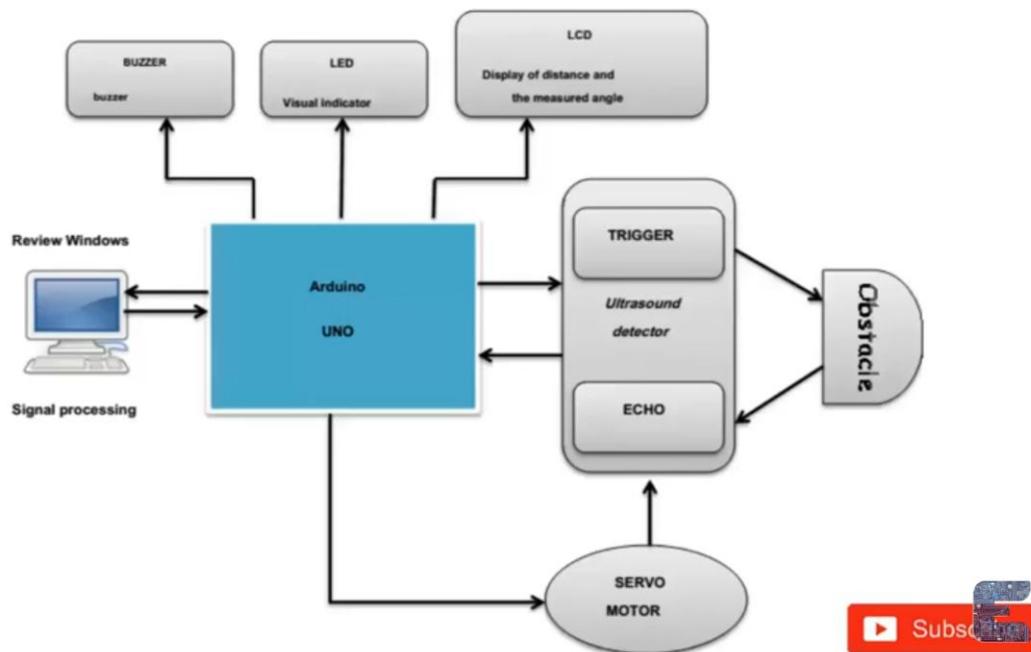


Fig 1

2.2 HARDWARE AND SOFTWARE REQUIREMENTS

Hardware components:

- Arduino UNO
- Ultra-sonic sensor
- Servo motor
- LCD display
- Raspberry pi
- LED lights
- Buzzer
- Pi camera
- USB power adapter

Connecting wires

Software:

Arduino processing IDE, Raspbian software

2.3 HARDWARE SETUP AND SPECIFICATIONS

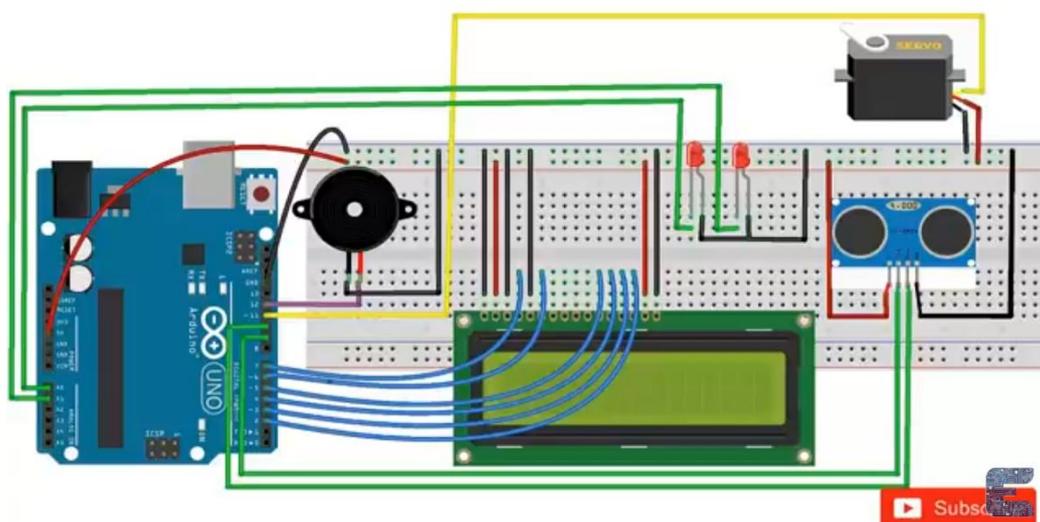
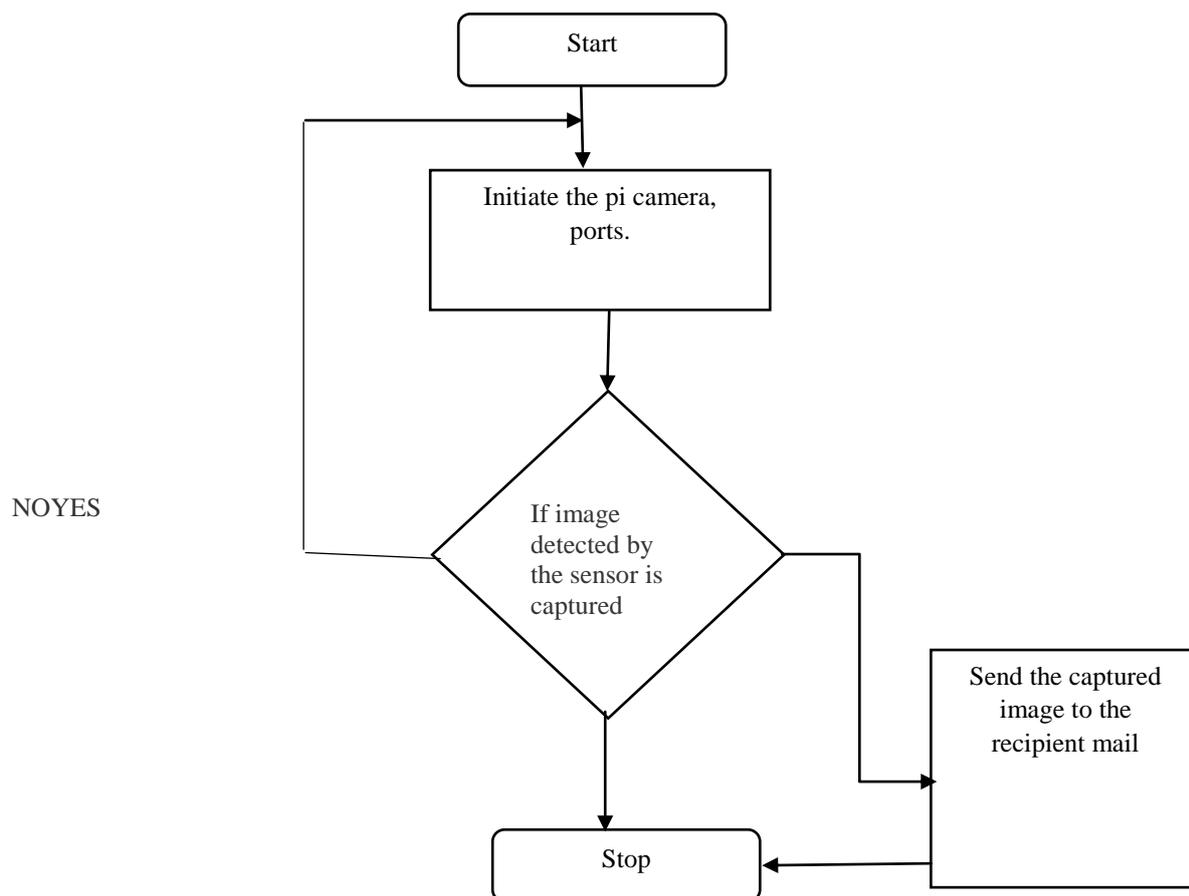


Fig 2

3. TABLE

COMPONENTS	SPECIFICATION
Arduino UNO	ATmega 328, 5V
Ultra-sonic sensor	Frequency 40KHz, Range 400cm
Servo-motor	5V
LCD display	16x2
Pi camera	3280 x 2464 pixel
USB power adapter	9-12V

4. PROCESS MAPPING / FLOWCHART



5. CONCLUSION

The advantages of our project is to measure distance and angle of the objects in the areaof vicinity by the radar, to capture the image of thesameand sending it as an alert message through mail. But to not able to detect or measure distance of objects outside the area of vicinity, moving objects can be detected and measured only if they are in the area of vicinity are certain limitations of our project.Furthermore, our project isused in Military applications for early-warning systems, space-borne missions and Air Traffic Control systems.

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