

# Radar System Final Report

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# **1 Introduction**

Radar (originally acronym for radio detection and ranging) is a detection system that uses radio waves to determine the distance (ranging), angle, and radial velocity of objects relative to the site. It can be used to detect aircraft, ships, spacecraft, guided missiles, motor vehicles, weather formations, and terrain.Radar was developed by various nations before and during Second World War.Generally, it works in the microwave area of the electromagnetic spectrum that is calculated in hertz when frequencies extend from 400 MHz to 40 GHz. The essential components which are used in the radar.

## **2 Project Details**

### **2.1 importance of the project**

The importance of the project: One of the needs of people today is the convenience provided by the radar system, for example, the car parking system and the automatic door sensor. In this project, in places where the field of view is limited and on devices that do not have a vision system, it allows the objects around to be noticed and gives a warning.

### **2.2 Purpose of the project**

The aim of this project is to show how to make radar, which is one of the most important parts of airplanes, ships and even cars whose value reaches thousands or millions of dollars in real life, with accessible and cheap materials, as well as to explain the principles of radar operation, to show what a wide range of uses radar has in real life and what materials a simple radar system consists of.

### 2.3 Roles

Members	Department	Number	Work
Murat Can	CMPE	11920089	Preparing reports and presentations
Alp	CMPE	119200046	Research
Hasan	CMPE	120200077	Preparing arduino codes
Kerem	EEEN	12345	Picking up and combining materials
Sercan	EEEN	12345	Picking up and combining materials

## 2.4 Timeline

Week	Date	Work
Week 1-2	November 1-14	<ul style="list-style-type: none"> <li>-Meet with group members and brain storming</li> <li>-Deciding project</li> <li>-Make a body to our project</li> <li>-Determine the role of group members</li> </ul>
Weeek 3	November 15-21	Midterm Week
Week 4	November 22-28	<ul style="list-style-type: none"> <li>-Decide materials for this project</li> <li>-Prepare and submit proposal submission</li> <li>-Research the materials for the price</li> </ul>
Week 5	November29-5	Discover and practice how to work with arduino
Week 6	December 6-13	<ul style="list-style-type: none"> <li>-Start to create our system</li> <li>-Prepare materials</li> <li>-Start coding part</li> <li>-Make interim report</li> </ul>
Week 7	December 14-21	Testing te cencor and buzzer with arduino
Week 8	December 22-29	Finalization of the project
Week 9	December30 - January 5	Preparing for the presentation and make some practices on system

### 3 Requirement List

Id	Produts
Item 1	Ardunio Uno R3 SMD CH340 Chip
Item 2	HC-SR04 ultrasonic distance sensor
Item 3	ultrasonic sensor mount (type a-b-c)
Item 4	SG90 RC Mini (9gr) Servo motor
Item 4	data cable
Item 5	M-F cable
Item 6	M-M cable
Item 7	Buzzer active 5v

## 4 Works Completed - video - fotograf



Fig 1: Study hall working



Fig 2: Latex and Coding



Fig 3: Fixing Components

## 5 Hardware Design

Building has made by cables,circuit and cencor and after all this we added buzzer to our system.

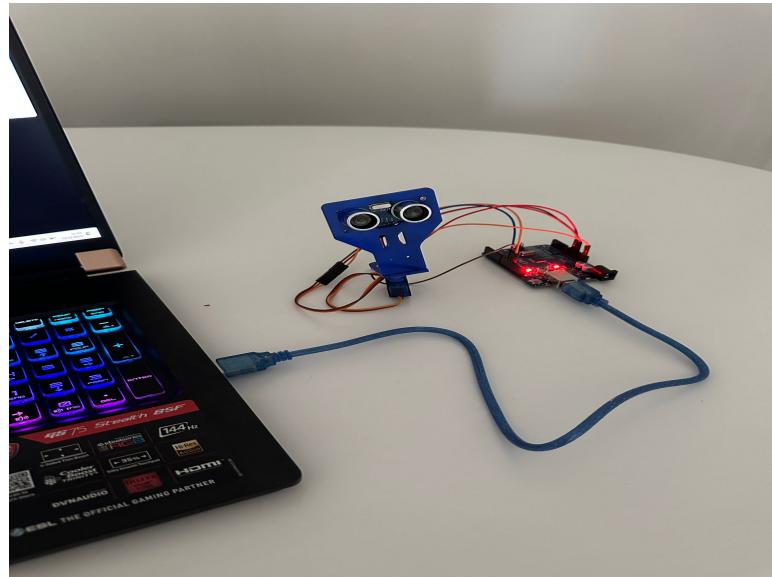


Fig 8: Project Desing

This figure illustrates prototype of project.Buzzer makes sound because when cencor perceive something system send notation to buzzer to make sound.

## 6 Software Design

Arduino IDE use C++ interface generally to purpose of creating projects. The reason why arduino is used is it checks all conditions after these conditions valid buzzer makes alert.

. ----- PHOTO (library) ----- .

Servo and .... libraries were used for working with Servo motor and ....

## 7 Test Cases

## 8 Vision - Future Works

Radar is a detection system which uses waves to determine the distance. A radar system consists of a transmitter producing electromagnetic waves. Radars nowadays are used to detect and track vehicles such as ships at sea and also insects and birds in the atmosphere. The main purpose of this project measures the distance between objects after that if objects located at a certain distance it gives alert. This system can be used in parking systems at cars, at sudden brake system. Not only this but also this system will be used in autonomous drive which they don't need driver.

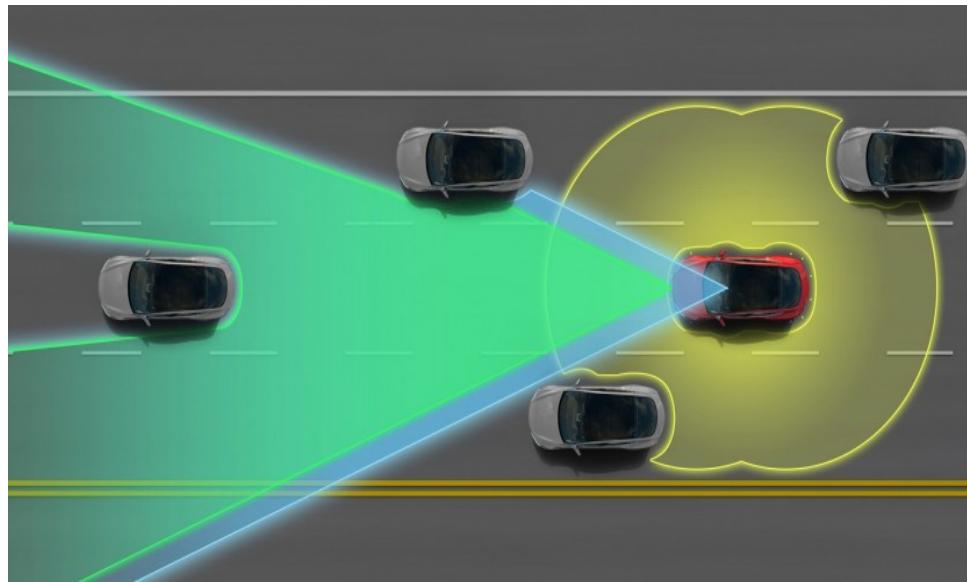


Fig 4: Car Radar System

### What can be done in the future?

Nowadays radar systems have a huge role in daily life. These systems make life more easy for people. In the future when humans get more information in space or if they can live in space this system can be used in different purposes. For instance any creature or entity in space when gets close to the people it gives alert for all humans who have been in space at that time. So Radars have a more necessary role in the future.

## 9 Equipments



Fig 5: HC-SR04 ultrasonic distance sensor



Fig 6: SG90 RC Mini (9gr) Servo motor

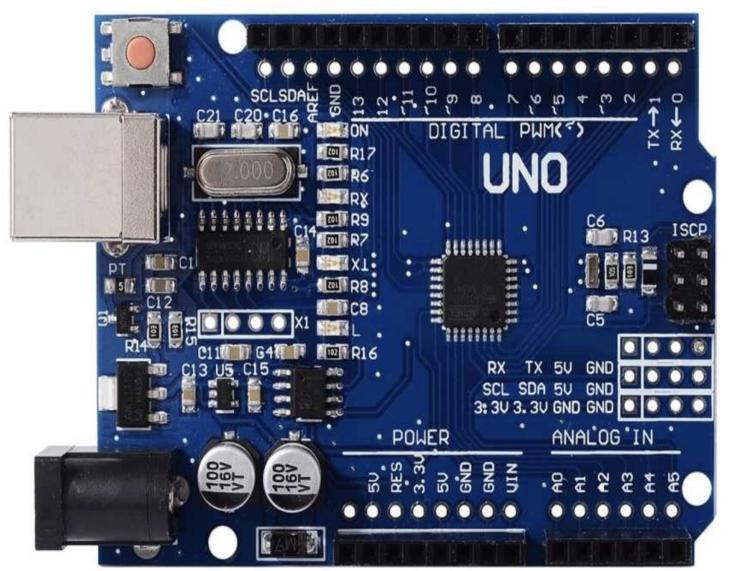


Fig 7: Arduunio Uno R3 SMD CH340 Chip



Fig 9: Buzzer

## 10 Cost Table and Analysis

This project costs 297 for the group. All members paid from their own budget we buy some equipments twice.

Arudiono cost 110

Buzzer 5 (our friend give the group members)

Servo 45.90

Ultrasonic distance censor 34.90

Chip (Arduino includes)

Data cable 9.90

MF cable 19.90

**NOT:** Bu bölüm tablo olarak düzenlenicek.

## **11 Conclusion**

Over the years, majority of the people get used to convenience. Because of technology. When technology advances this brings simplicity to people's life. And radar's have important role to make life easier. It is used on fishing, determine weather conditions, car and also used in security. With this project tries to calculate distance and give alert or don't give by given conditions. For this reason this project should be used in many places to appeal more comprehensive.

## 12 Reference

### References

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