FINAL YEAR PROJECT REPORT

“Car crash prevention system using radar and ultrasonic sensors’’

Project Advisor

Mr. Ali Murtaza

Submitted by

Muhammad Anas Abrar – 091420-368

Bilal Abdullah ——————091420-160

Farrukh Zaman Khan — 091420-292

Department of Electrical Engineering

School of Engineering

University of Management and Technology

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Project Advisor

Sir Ali Murtaza

Declaration

I declare that the work contained in this thesis is our own, except where explicitly stated otherwise. In addition this work has not been submitted to obtain another degree or professional qualification.

Signed: _____

Dated: _____

Acknowledgement

Thanks be to Allah Almighty Who gave us the strength to make a decision to choose the project topic for our final project, moreover make us able to work on this project by utilizing all our abilities and powers. He has given us the knowledge to choose the best path among the bests.

This project is a culmination of a long period of work and without the support of many individuals; it would never have been existed. First and foremost, we thank our families, for their care and endless support, both moral and financial, to complete this project.

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Regards:

Muhammad Anas Abrar– 09142-368

Bilal Abdullah ——————091420-160

Farrukh Zaman Khan —– 091420-292

Dedicated to my beloved parents who offered us unconditional love and support throughout the course of our studies.

Abstract

The objective of this project is to develop a prototype model that can prevent crash presentation in cars using radar and ultrasonic sensors.

The main aim of this project is to prevent the collision on the road. Many methods have to be followed to prevent the collision on the road, but here radar and ultrasonic sensors are being used. The mother board used as a microcontroller provides some additional features for future enhancement. This project consists of two major units 1) Transmitter Unit and 2) Receiver Unit.

This project comprises of three major parts the first one is radar system that is used in the front side which will measure the speed of the hurdle or the automobile and in the front and eventually will calculate the distance between the object and the car in which my system is installed. The second part consists of the side view systems in which ultrasonic sensors are used to calculate the distance between the car and the other car in its side. And the third portion is of the software base in which arduino software and the arduino mother board is used in which all the inputs of the radar, ultrasonic sensors and the hall effect sensors will be given so that the motherboard can take the action against this reaction by applying the brakes using DC motor. The data can be processed by the controller, and drives the motors in the opposite direction. All the status about transmitter end is displayed in LCD. The controller also initiates the Buzzer. This unit is placed in the Car.

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Introduction

INTRODUCTION

1.1-Background

Crash prevention on roads with the Help of Doppler Radar and Ultrasonic Sensors. It will decrease the ratio of car accidents on roads. Arduino Software and Arduino Mega 2560 motherboard are used to handle the data and to take some particular steps if there is some collision about to occur. Arduino Mega 2560 motherboard is helpful because by using it almost no microcontrollers are to be used as it has all the necessary input and output pins of analog and digital.

The Radar and ultrasonic sensors both have their own transmitter and receiver, will detect the distance between the car and the object by using frequency. Same method will be used by the Doppler radar to detect the speed of the car in the longitudinal. All the inputs of the frequency will be given to the Motherboard on the same side there is Hall Effect sensor placed on the wheel of the car in which this system is installed to detect the speed of our car. The result from the hall Effect sensor will also go to the Motherboard 2560 which read all the data and take the action by applying automatic brakes if there is some car in the front of the car less than the defined parameter in Source Code. The Brakes will be applied with the help of Dc motor which will rotate the direction of the system. On the other side the for the side view, ultrasonic sensors will measure the distance of the side of the car with other cars or object and will indicate the driver by turning on the LED on the particular side or displaying the data on the LCD installed inside the car.

1.2-Overview of project

We are developing such a system that can prevent the collisions of the cars on the roads hence decreasing the percentage of road side accidents. This project can be of benefit in other fields too such as the crash prevention in aero planes. The key features of our project are as follow

- Monitoring the longitudinal distance of the car by using radar.
- Monitoring the side view distance of the car with other car.
- Automatically applying brakes it the longitudinal distance is less than the passed parameters in the source code.
- Indicate the driver by blinking the LED on the particular side from which there will be chance of some accident.
- Automatic brakes will be applied with the help of DC motor which will get instruction by the Arduino Motherboard.
- Hall Effect sensors will be placed our car too which will tell the speed of our car so that it can be compared with the speed of the car in front and some particular action can be taken.