

POLITEKNIK

SULTAN SALAHUDDIN ABDUL AZIZ SHAH

**An IoT based Obstacles Detection And
Alerting System In Road**

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JABATAN KEJURUTERAAN ELEKTRIK

SESI 2 2021/2022

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This report submitted to the Electrical Engineering Department in fulfillment of the requirement for a Diploma in Electrical Engineering

JABATAN KEJURUTERAAN ELEKTRIK

SESI 2 2021/2022

CONFIRMATION OF THE PROJECT

The project report titled "An IoT based Obstacles Detection And Alerting System In Road" has been submitted, reviewed and verified as a fulfills the conditions and requirements of the Project Writing as stipulated

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“I acknowledge this work is my own work except the excerpts I have already explained to our source”

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**TITLE : AN IOT BASED OBSTACLES
DETECTION AND ALERTING
SYSTEM IN ROAD**

SESSION: SESI 2 2021/2022

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2. I acknowledge that 'The Project above' and the intellectual property therein is the result of our original creation /creations without taking or impersonating any intellectual property from the other parties.

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As a project supervisor, on the date:

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ABSTRACT

In a recent incident in Sepang, Negeri Sembilan, a school student was killed from being ran over by a school van. While the victim crossed in front of the moving van, he was accidentally struck and injured in the head. In Malaysia, the number of road accidents has grown during the last ten years. Meanwhile, the number of fatalities has been dropping steadily from a record of 7,152 in 2016 to a low of 6,167 in 2019 over the last ten years. Malaysia's accident rates have increased, whether it is by cars or motorcycles. There are several accidents involving food runners these days, such as foodpanda. It is caused by oneself or the cars they were surrounded by while riding. This project provides a clever solution to avoid any kind of close contact or accident. An IOT Based Detection And Alerting System In Road will identify any person or thing that approaches and will alert the user via LCD or smartphone apps. The sensor can be connected to the vehicle's blind spots to notify either car owner or other drivers of potential crashes. It is shown that this Project is successful and able to be used in more than one way at the same time.

Keywords: Accident, Driver, Car, Motorcycle, Prevent

ABSTRAK

Dalam kejadian di Sepang, Negeri Sembilan baru-baru ini, seorang pelajar sekolah maut akibat dilanggar oleh van sekolah. Ketika mangsa sedang melintas, van yang dinaikinya mula bergerak lalu secara tidak sengaja mangsa dilanggar dan cedera di bahagian kepala. Di Malaysia, bilangan kemalangan jalan raya telah meningkat dalam tempoh sepuluh tahun yang lalu. Sementara itu, jumlah rekod kematian telah menurun secara berterusan daripada 7,152 pada 2016 kepada paras terendah iaitu 6,167 pada 2019 dalam tempoh sepuluh tahun lepas. Kadar kemalangan di Malaysia telah meningkat, sama ada berpunca daripada kereta atau motosikal. Terdapat beberapa kemalangan yang melibatkan penghantar makanan, seperti foodpanda. Kemalangan yang melibatkan penghantar makanan adalah berpunca daripada penunggang itu sendiri ataupun kereta yang dikelilingi semasa menunggang. Projek ini menwujudkan penyelesaian yang bijak untuk mengelakkan daripada sebarang jenis kemalangan di jalan raya. An IOT Based Detection And Alerting System In Road akan mengenal pasti mana-mana orang atau halangan yang mendekati dan akan memberi amaran kepada pengguna melalui LCD atau aplikasi pada telefon pintar. Penderia boleh disambungkan ke titik buta pada kenderaan untuk memberitahu sama ada pemilik kereta atau pemandu lain tentang kemalangan yang bakal terjadi. Ini menunjukkan bahawa Projek ini berjaya digunakan lebih daripada satu cara pada masa yang sama.

Kata Kunci: Kemalangan, Pemandu, Kereta, Penunggang, Mengelakkan

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CHAPTER 1

1 INTRODUCTION

1.1 Introduction

An IoT based Obstacles Detection And Alerting System In Road is a device that measures range or distance in an area, often as part of a safety system on the vehicle. LCD or apps in smartphone that connect to the sensor will show how far an object and alarm will alert the user when it detects the object. This type of device is useful to people that want to avoid contact or keep their distance from humans when walking or on the road.

An ultrasonic sensor that attaches to Arduino sense emits high-frequency, inaudible acoustic waves in one direction when the transducer element vibrates. If the waves strike and bounce off an object, the transducer receives the echoed signal. The sensor then determines its distance from the object based on the length of time between the initial sound burst and the echo's return. Ultrasonic sensors require fairly accurate timing circuitry, so acoustic sensors really require a processor of some sort to drive them.

Ultrasonic sensors should be a first choice for detecting clear objects, liquids, dense materials of any surface type (rough, smooth, shiny) and irregular shaped objects.

1.2 Background Research

In Malaysia, complaining about traffic jam in the city is something we have done before because it is something that we face every day when we are going to work. Other than that, something that always happens every day on the road is an accident.

Whether it is in newspapers or social media, there is always news about an accident on the road. Road accidents involving cars, motorcycles, and even heavy-duty vehicles such as cranes and lorries would crash into other vehicles or people at any time for a

lot of reasons. Reasons for accidents such as carelessness while on the road and driving dangerously need to be stopped for the sake of others.

Such accidents can be avoided whether from the driver themselves or other drivers that share the same road. All drivers and riders make mistakes while on the road and that is something that could be prevented with some help.

1.3 Problem Statement

In recent event, school student is killed due to ran over by school van at Sepang, Negeri Sembilan. The victim was hit and injured on the head while crossing the road. The number of road accident in Malaysia is increased during last ten years. Meanwhile, the number of fatalities has been a steady reduction from the peak at 7,152 in 2016 and showed the lowest number at 6,167 in 2019 during the last ten years. Accident rates in Malaysia has increase whether car or motorcycle. These days, there are lot of accidents involve the food runner such as foodpanda. It is caused by themselves or cars that they are surrounded while on the road.

1.4 Research Objectives

The main objective of this Project is to demonstrate a smart way to prevent any close contact or accidents of any kind. More specifically the principle objective of this research is to design something that would help the driver or motorcycle rider to avoid accidents. I have a solution for the problem involving vehicle security on the road.

1. To detect any object or people that come and sensor that connect to the circuit will notice the user by LCD or apps that install in smartphone.
2. The purpose of implementation of this project is to prevent road accidents.
3. This project would be able to develop a way to avoid or reduce the number of road accidents.

1.5 Scope of Research

1. This Project is focusing on vehicle security. An IoT based Obstacles Detection And Alerting System In Road is the project to detect people or objects whether in front of back of the vehicle by sensors.
2. The emphasis of the project is employing an alarm to alert people when an object is close to the vehicle. The main controller is using the Arduino to transfer data to the output LCD, LED, buzzer, and smartphone after the sensor detects the obstacles.
3. Ultrasonic sensors can be used as security, alarm, level control and detection in a lot of places such as homes, parking and warehouse.

1.6 Project Significance

This project is not the first and it already had a lot of different designs and different names for different uses such as car reverse or parking sensor, fuel sensor, and engine sensor. These sensors are there to protect the condition of the vehicle but one thing that they all have in common is that they all can be improved. This project is focusing on the sensor to detect obstacles in front or back of the vehicle. In 1982, Toyota introduced ultrasonic back sonar, also known as an ultrasonic sensor. Massimo Ciccarello and Ruggero Lenci applied for a patent for ultrasonic parking sensors on December 13, 1984, and the Ministry of Industry gave them the patent on November 16, 1988. In modern days, almost every car has parking sensor whether it is installed from factory or aftermarket products. This project is to give more outputs for sensor whether can be heard with buzzer or seen with LED or LCD so the obstacles can't be overlooked. With more outputs, it can help the user to be more alert of surroundings while driving. Output of the sensor such as buzzer or LCD could begin to malfunction over time, or if you have been in an accident, and when a driver isn't aware of the problem, things can quickly get dangerous. It will be safer to have more than one output.

1.7 Chapter Summary

In chapter 1, it is contained with introduction background research of the project alongside with information that relates to the project “An IoT based Obstacles Detection And Alerting System In Road”. Research of the project cite with previous projects that like this project and able to explain the problem statement, and research objectives and scope. Project significance is cited with previous projects such as parking sensor.