UNIVERSITI TEKNIKAL MALAYSIA MELAKA

SPEED LIMIT DETECTION FOR VEHICLE USING GSM

This report is submitted in accordance with the requirement of Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electronics Engineering Technology (Telecommunications) with Honours.

by

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I hereby, declared this report entitled "Speed Limit Detection For Vehicle Using GSM" is the results of my own research except as cited in references.

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APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Electronics Engineering Technology (Telecommunications) with Honours. The member of the supervisory is as follow:

....
(Madam Wan Haszerila Binti Wan Hassan)

ABSTRAK

Pada masa kini kenderaan di syarikat pengangkutan awam atau kenderaan sewa sering terlibat dalam kemalangan dan sentiasa mempunyai saman tanpa disedari. Masalah ini adalah disebabkan oleh kecuaian pemandu kerana memandu melebihi had laju. Dengan "Speed Limit Detection for Vehicle Using GSM", Jika kenderaan melebihi had laju, mesej tertentu akan dihantar kepada pengguna. Tujuan sistem ini adalah untuk memberikan keselamatan kepada pengguna jalan raya, mengurangkan saman dan mengelakkan kemalangan. Sistem ini menggunakan (GSM), yang bertindak untuk menghantar mesej kepada pihak tertentu. Melalui sistem ini, pemandu akan lebih berhati-hati dengan had kelajuan yang diambil. Dalam keadaan ini, jika pengguna memandu kenderaan melebihi had laju, sistem ini akan berkhidmat untuk menghantar mesej kepada pihak tertentu. Objektif projek ini adalah untuk mereka bentuk sistem pengesan had laju dan untuk meningkatkan keselamatan di jalan raya. Projek ini akan berfungsi apabila kenderaan melebihi 110 km/h, mesej tertentu akan dihantar kepada pihak tertentu dengan menggunakan modem GSM untuk memberi tahu bahawa pemandu melebihi had laju. Sistem ini mensasarkan pada kumpulan-kumpulan seperti syarikat-syarikat pengangkutan awam, sewa kenderaan dan kenderaan persendirian. Dengan menggunakan sistem ini, ia dapat menyelesaikan masalah seperti kemalangan jalan raya dan saman.Sistem ini menggunakan IR sensor sebagai pengesan kelajuan, buzzer sebagai penggera dan light crystal display (LCD) untuk memaparkan.

ABSTRACT

Nowadays the vehicle in the public transportation company or the rental vehicle is often involved in an accident and always has the unnoticed summons. This problem is due to the carelessness of driver because of driving over the speed limit. With the system Speed Limit Detection for Vehicle Using GSM, if the vehicles are exceeding the speed limit, acspecifi message will be sent to the users. The aim of the system is to provide safety to motorists, reducing the summons and prevent the accidents. The system uses (GSM) which acts as telecommunication medium for sending a message to a particular party. With the implementation of this system, the drivers are hoped to be more alert to the speed limit determined by the authorized party. In this situation, if a user is driving at a speed exceeded the limit, the system will send a message to a particular part. The objective of this project is to design a speed limit detection system and to improve safety on the road. This system will function when the vehicles exceed 110 km/h by sending specific messages to a specific party using GSM modem to alert the driver. This system is targeted for the groups such as public transport companies, rental vehicle and private vehicles. By using this system, it can reduce a problems such as accidents and the summons. The system uses an IR sensor as a speed detector, a buzzer as alarm and light crystal display (LCD) for display.

DEDICATION

Dedicated to my beloved parents, Mr. Husin Bin Omar and Mrs. Jamariah Binti Kesip who always motivates me along the process of completing the project.

ACKNOWLEDGEMENT

In the name of Allah, the Most Beneficent and Most Merciful, I have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. Thanks to Allah, the Almighty God, that has given me the strength and spirit for me to complete this project. I wish to express my sincere thanks to my Project Supervisor, Madam Wan Haszerila Binti Wan Hassan. I am extremely thankful and indebted to her for sharing expertise, and sincere and valuable guidance and encouragement extended to me. I take this opportunity to express gratitude to my parents for the unceasing encouragement, support and attention. I also would like to express my deep gratitude one and all, who directly or indirectly, have lent their hand in this venture.

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LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

GSM - Global System for Mobile Communications

IR Sensor - Infrared Sensor

GPS - Global Positioning System

MEMS - Micro-Electro-Mechanical Systems

SDC - Smart Display & Control

RF - Radio Frequency

GPRS - General Packet Radio Service

ARM - Advanced RISC Machine

2G - Second Generation

LCD - liquid crystal display

MS - Mobile Station

MSC - Mobile Switching Centre

TRX - Radio Transceivers

BSC - Base Station Controller

BTS - Base Transceiver station

VLR - Visitors Location Register

HLR - Home Location Register

EIR - Equipment Identity Register

CHAPTER 1
INTRODUCTION

1.0   Background

The device developed in this project is called "Speed Limit Detection For Vehicle Using GSM" where the system is able to monitor speed limits remotely using GSM modem. If the vehicles exceeding the speed limit, specified message will be sent to a authorized party. The purpose of this device is to provide safety to motorists, reducing the summons and accidents. The system uses GSM which acts as sending a message to a particular party. Through this system, motorists will be more careful with the speed limit. In this situation, if a user is driving the vehicle exceeding the speed limit, the system will send a message to a particular part.

The system will function when the vehicles exceed 110 km/h where specific messages will be sent to a specific party using GSM modem to inform that the driver exceeds the speed limit. This system is targeted for groups such as public transport companies, vehicle rental and private vehicles. From this project, things like accidents and the summons will be reduced.

1.1 Problem statement

Nowadays the vehicle in the public transportation company or the rental vehicle is often involved in an accident and always has the unnoticed summons. This problem is due to the carelessness of driver because of driving over the speed limit. Therefore, we propose a system called Speed Limit Detection for Vehicle Using GSM to alert the drivers who have exceeding the speed limit, by sending a message to a specified party.

1.2 Objective

Among the objectives of this project are:

1. To design a speed limit detection system.
2. To understand the concept of Arduino and GSM.
3. To improve safety on the road.

1.3 Scope

In this project, the system will be take place in the office of a rental vehicle or the public transportation company. The purpose of this project is to assist the owner of a rental vehicle or the public transportation company by monitoring the speed limit of the vehicle using the GSM modem. If the vehicles exceeding the speed limit, GSM moedem will sent warning message to a specific party. This project is using IR Sensor (Infrared Sensor), GSM Modem, and Arduino Uno as the main equipment.

1.4 Summary / Conclusion

This chapter covers the background of project, problem statement, objectives and scope of the project. The background of the project is about the background of speed limit detection for vehicle using GSM. This project is designed to monitor speed limits remotely using GSM modem. The objective is discussed in detail, besides the scope discussed about the hardware and software that used in this project.

1.5 Report Organization

This report consists of five chapters. The first chapter describes the project background, problem statement, objectives and the scope of this project.

Chapter 2 discusses the literature review of the project and related works. In addition, various methods and approaches that related to the project are discussed and review

Chapter 3 exploring the research methodology used in the project development including data gathering and analysis, flow charts and other related diagram.

Chapter 4 discusses the result and discussion related to the projects outcome. Finally, the fifth chapter concludes the overall project implementation, outcome and also include some future recommendation.

CHAPTER 2
LITERATURE REVIEW

2.0   Introduction

Speed limit detection for vehicle using GSM is a system that uses the GSM system as an improvement of the existing Speed Limit. This chapter has covered about the previous system and the past study that related to this project. Besides, this section also explains about a component that use in this project.

2.1   Previous System and Existing Technology

Various technologies have been developed using GSM system to sending the specified message or information to a specific party. This chapter has covered about the previous system that developed using GSM and the past study that related to this project especially in detection the speed limit of vehicle.

2.1.1   Vehicle Speed Limit Alerting and Crash Detection System at Various Zones

The main target of this project is to configuration Smart Display controller suggested for vehicle's speed farthest point and crash alarms which can continue running on an installed framework. Smart Display and Control (SDC) can be uncommonly made to fit into a vehicle's dashboard, and showcases information on the vehicle. Nowadays people always drive over

speed limit, mishaps are happening as often as possible, we lost our valuable life by committing little error while driving (zone insightful, slopes territory, roadways). So as to keep away from such sort of accident and to alert the drivers about as far as possible in such sort of places the highway department have placed the signboards. But sometimes it may to possible to view that sort of signboards and there is a chance for accident. So to intimate the driver about as far as possible at zones and to distinguish crash naturally, is finished by method for utilizing MEMS,RF,GPS,GSM innovation (Singh 2013).

2.1.2 Vehicle Speed Control System Using GSM/GPRS

The proposed of this project is an attempt to control the speed of the vehicle planned with PC programming to enable the third party or owner to get the location, speed and action of the driver. To accomplish this, the framework can transmit the data continuously. The use of GSM/GPRS technologies permits the framework to track the object and give the up-to-date information. This data is approved to particular clients over the web as the server gets the data. It is tele-monitoring system to transmit information to the remote client. In this way the applications are utilized as a part of continuous activity observation. This paper proposes a model for area following utilizing Geographical Positioning System (GPS) and Global System for Mobile Communication (GSM) innovation. The improvement depends on the windows telephone 8 application by means it can give adaptability and transportability to the client to get the data from anyplace. As these GPS advancements having more noteworthy scope of frequencies, the client can get the data as speedier as could be expected under the circumstances. This system is very useful to speed control at specific traffic roads (Devikiruba 2013).

2.1.3 Automatic Speed Control Of Vehicle In Restricted Areas Using Rf And GSM

This project has an aim to control the speed of any vehicles automatically in cities and also in restricted areas such schools, parks, hospitals and in speed limited areas etc. Nowadays in a fast moving world all the peoples are not have self-control. Such peoples are driving vehicles in a high speed. so the police are not able to monitor all those things. This project provides a way for how to control the speed without harming others. Driver does not control anything during such places; controls are taken automatically by the use of electronic system. In this project we using RF for indicating the speed limit areas it is placed front and back of the restricted zones. RF receiver is placed inside the vehicle. Speed is acquired by the help of speedometer in the vehicle. The controller compares the speed. If it exceeds the limited speed the controller alerts the driver and controls taken automatically. If they does not respond that message an information along with the vehicle number is transmitted to the nearest police station by the use of GSM and penalty amount is collected in the nearest toll gate (Vengadesh & Sekar 2015).

2.1.4 Automatic Vehicle Accident Detection and Messaging System Using GSM and GPS Modem

The rapid development of innovation and framework has made our lives simpler. The approach of innovation has likewise expanded the traffic hazard and the road accident take place frequently occur huge loss of life and property because of the poor emergency facilities. Our project will give an ideal answer for this disadvantage. An accelerometer can be utilized as a part of an auto caution application so that unsafe driving can be recognized. It can be utilized as a crash or rollover locator of the vehicle amid and after a crash. With signs from an accelerometer, an extreme mishap can be perceived. As indicated by this venture when a vehicle meets with a mishap promptly

Vibration sensor will recognize the flag or if an auto moves over, and Micro electro mechanical framework (MEMS) sensor will distinguishes the flag and sends it to ARM controller. Microcontroller sends the ready message through the GSM MODEM including the area to police control room or a save group. So the police can instantly follow the area through the GPS MODEM, in the wake of getting the data. At that point subsequent to acclimating the area fundamental move will be made. On the off chance that the individual meets with a little mischance or if there is no genuine danger to anyone`s life, then the ready message can be ended by the driver by a switch gave keeping in mind the end goal to abstain from squandering the important time of the medicinal safeguard group (Krishna et al. 2013).

2.1.5 Over Speed Violation Management and Control of Vehicle Based on Zigbee

The objective of the study is to design and build up another framework that can adequately distinguish speed violation on the road and the driver to obey traffic rules while driving by keeping up the speed as far as possible endorsed. In the present day situation movement guidelines are as often as possible damaged by the drivers and over speeding happen because of terrible driving conduct. In this way, a driver help framework is given to avert over speeding, infringement of street tenets furthermore to show ready messages. The proposed framework has an alarming, recording and reporting framework for over speed infringement administration. The Zigbee transmitter sends the speed furthest reaches of the specific path entered by the vehicle furthermore gives cautions like street works, soak inclines, school zone as acoustical messages furthermore in LCD. The recipient unit set in the vehicle gets the messages and sends to the microcontroller. At the point when speed of the vehicle nears as far as possible it shows the notice and if surpasses the cutoff, the microcontroller records the damaged speed and time. The LCD shows the path speed farthest point and demonstrates the quantity of times, speed was disregarded. In the meantime our framework will control

the speed, if vehicle client does not backs off the speed to that of specific zone speed constrain. Framework will continue checking the no. of times speed surpassed, record of which sent to the control room. Increment in the number of infringement expands the punishment sum which can be gathered in toll doors found close-by. Eventually driver's conduct can be enhanced here. A GSM module sends message to the closest activity work force instantly after an infringement happens. A verified gadget is likewise given, which can be worked just by the activity police in whom he can recover the information put away whenever (Sarowar & Shende 2015).

2.1.6 Wireless Accident Information System Using GSM and GPS

This review examines about planning a Smart Display and Control (SDC) which will screen the zone and keeps up the predetermined speed in the zone levels, which keeps running on an inserted framework. This framework incorporates three modules; programmed speed control module, mischance identification and data sending module and security empowering module. Programmed speed control module incorporates RF transmitter put in particular area and RF beneficiary in the vehicle. Mishap recognition module incorporates GSM and GPS innovation. Security empowering module incorporates tactile units which guarantees the state of safety belt and the driver. This module incorporates alcohol sensor and eye sensor. The keen show and control is made out of two separate units: Zone status Transmitter unit and Receiver (speed Display and Control) Unit (Rathinakumar & Manivannan 2012).