VEHICLE SAFETY AND ACCIDENT ALERT SYSTEM USING GPS TRACKING

EDIEL EREZA BIN MOHAMAD BAHARUDIN

UNIVERSITI TEKNIKAL MALAYSIA MELAKA
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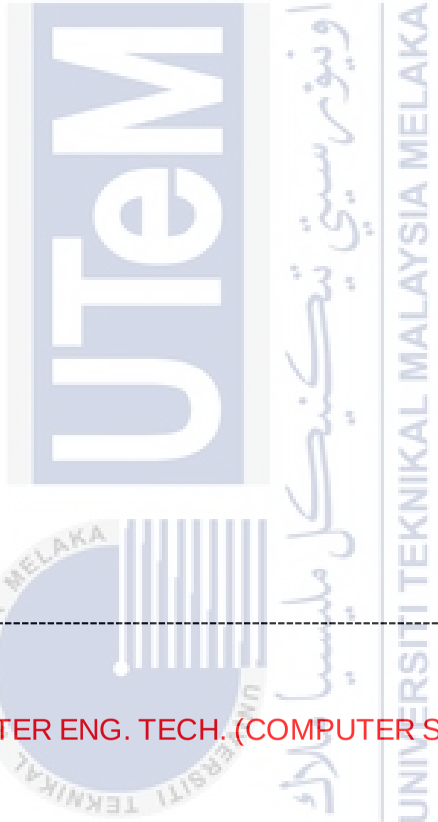
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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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BACHELOR OF COMPUTER ENGINEERING(COMPUTER SYSTEM) TECHNOLOGY WITH HONOURS

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I hereby, declared this report entitled "Vehicle Safety and Accident Alert System Using GPS Tracking" 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 Computer Engineering Technology (Computer System) with Honours. The member of the supervisory is as follow.

Signature : Azman Awang Teh

Supervisor Name : *En. Azman Bin Awang Teh*

Date : 14 Feb 2021

DEDICATION

To my father, Mr Mohamad Baharudin Bin Ramli and to all my sibling I will never had a chance to say thank you for all your support for everything that I'm doing right now. I dedicate this report to my family which encourages me and support my passion toward my studies and joyful experience. Also, thanks to my friends who helped me through all this year studies. Last but not least, my supervisor, Mr Azman Bin Awang Teh that teach me and guide me all this time throughout this final year project. I would like to say thank you for all your advices and also I'm would like to say sorry for not being able to be best student for you through this 1 whole year that you have been guided me. May Allah bless all of them.

ABSTRACT

This project will track vehicle using GSM and GPS if vehicle involved in an accident. The accelerometer detects the sudden change in the axes of vehicle and GSM module sends the alert message on mobile phone with the location of the accident. The location is sent in the form of Google Map link, derived from the latitude and longitude from GPS module. There will be two sensors which are gyro sensor and ultrasonic sensor. The job for ultrasonic sensor is to measure the distance between vehicle and nearby obstacles directly around the front or rear bumper. The vehicle will automatically stop the car from runs through the obstacle. For gyro sensor it will alert the GPS module to send the link of the accident location through SMS to mobile phone. The coding of the system need user to register mobile number of family members to get the SMS alert of the accident.

ABSTRAK

Projek ini akan mengesan kenderaan menggunakan GSM dan GPS sekiranya kenderaan terlibat dalam kemalangan. Accelerometer mengesan perubahan mendadak pada paksi kenderaan dan modul GSM menghantar pesanan amaran di telefon bimbit dengan lokasi kemalangan. Lokasi dihantar dalam bentuk pautan Peta Google, berasal dari garis lintang dan garis bujur dari modul GPS. Terdapat dua sensor iaitu sensor gyro dan sensor ultrasonik. Tugas untuk sensor ultrasonik adalah mengukur jarak antara kenderaan dan halangan berdekatan secara langsung di sekitar bumper depan atau belakang. Kenderaan secara automatik akan menghentikan kereta daripada berjalan melalui halangan. Untuk sensor giro ia akan memberi amaran kepada modul GPS untuk menghantar pautan lokasi kemalangan melalui SMS ke telefon bimbit. Pengekodan sistem memerlukan pengguna untuk mendaftarkan nombor keluarga ahli keluarga untuk mendapatkan makluman SMS mengenai kemalangan

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LIST OF SYMBOLS AND ABBREVIATIONS

UNO	-	Arduino UNO
US	-	Ultrasonic Sensor
GSM	-	Global System for Mobile
GPS	-	Global Positioning System
MPU	-	Gyro Sensor
HC-05	-	Bluetooth Module
L298N	-	Dual H-Bridge Motor Driver
BATT	-	14500 Li-Ion 3.7V Battery
ADC	-	Analog to Digital Converter
GPRS	-	General Packet Radio Services
PWM	-	Pulse Width Modulation

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CHAPTER 1

INTRODUCTION

1.1 Background

Innovation of a vehicle organize was the generative power for individuals to give the most elevated progress on earth over the human being. Automotive matters a great deal in our everyday lives. Thus, we are able to use it to our work environment, to stay in touch with our loved ones and to convey our merchandise. However, it can likewise bring us disaster and can even slaughter us through mishaps. As confirmed by (NAZARI, 2019), between January to June 2019, 281 mishaps have been accounted for everywhere throughout the nation. As we can see, 2.5% expansion from a year ago, which saw 274,556 mishaps in a similar period.

As indicated by (NAZARI, The Rakyat Post, 2019) , Selangor held 29.7% of all street mishaps across the nation (83,607 cases), trailed by Johor with 14 .6% (41,161 cases) and Kuala Lumpur with 12.9% (36,288 cases). Despite multiple attempts by various governmental and private organizations across the globe towards raise awareness of reckless driving, accidents happen every now and then. Nonetheless, if the vehicle accident alert service could be implying to every vehicle, several lives could have been saved.

GPS is a typical innovation that was created for end user military technology. It later opened for regular citizen use. Hence, it utilized for a wide assortment of utilizations including area, course, speed, timing, review, coordinations, traffic the executives, security, and so forth. It also become a fundamental piece of a following and route program for the vehicles. GPS able to give the specific time, facilitate position and speed. Worldwide System for GSM then again

is a regularly utilized remote portable communication framework. In excess of 690 portable systems offer GSM inclusion in 213 nations and GSM also represents 82.4% of all phones around the world. Notwithstanding voice correspondence, it likewise gives information transmission through SMS and GPRS

This paper proposes to use a GPS receiver's capability to track a vehicle's speed and to identify collision refers to the speed measured as well as transmit to the Alert Service Center using the GSM network the position information of the collision from the GPS information carried by the Arduino UNO. The remainder of the paper is structured according to this. The Related Work section explains the analysis of the collision detection scheme, the tools and implemented Technique part defines the equipment as well as computation ability to prevent the accident, the detection system and continued interaction defines the accident detection and going to send process speed measurement procedure and ultimately the study is finalized.

1.2 Problem Statement

Various mechanical and sociological upgrades have decreased traffic fatalities during the previous decade, in this manner for safety belt only can help to reduced death of the victim. The street mishaps are one of the points for victim death. Has been stated that the vast majority of these passing happen because of late action takes by emergency service or family members in remote regions or around evening time where there is no observer or a methods to help victim in time. Additionally, every moment that a harmed crash casualty doesn't get fast action from the emergency responds nor the family members. This project tries to lessen the mishap by advising the relatives about the mishap with exact area accident had occur.

1.3 Research Objective

The main aim of this research is to propose a systematic and effective methodology to estimate system wide TL of MV distribution network with reasonable accuracy. Specifically, the objectives are as follows:

a) To inform directly to the family victim about the accident.

b) To design affordable vehicle safety and accident alert with tracking system.

c) To give approximate location of the incident occurs to family victim.

1.4 Scope of Research

This fragment talks about the idea of the venture's work. Ultrasonic sensor is utilized to distinguish crashes or distances between objects to accomplish the task 's reason, as we center around identifying a circumstance of a fixed vehicle in the road or thruway until the ultrasonic distance that is customized is detected, the vehicle will consequently stop. Utilizing Arduino for this task, these sensors can be modified utilizing Arduino UNO as the microcontroller card and fill in as the vehicle for connecting the ultrasonic sensor to trigger the snag alert before the vehicle. Gyro sensor likewise act critically in this undertaking work, this sensor will alarm the family casualty about the episode or impact happen to the driver by introduce the Arduino UNO to trigger the caution if certain accident or harm esteem happen to the person in question and will convey message about the area of the mishap happen.

1.5 Thesis Outline

For Chapter 1 which is the presentation clarifies venture foundation, issue explanation, and targets of undertaking, task's extension and the significance of this venture. For Chapter 2 which is writing survey secured the writing audit and reference about any data that identified with this venture from any references. In this part, the reference about examination of gear likewise notwithstanding. For Chapter 3 which is the procedure, secured increasingly definite clarification of this venture. Additionally, this part gives data of procedurestream in this venture. For Chapter 4 which is the outcome desire, clarify about the consequence of this venture joined by a few examinations. For Chapter 5 which is the end, secured the end dependent on generally speakingprocedure that occurred in this venture from start until end of this undertaking followed by future suggestions of this task.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Chapter 2 demonstrates literature review for the research that has done in order to know depth details related with this project. In this chapter we will further discuss about "research on existing project and comparison between existing system and system updated developed". All the data and information for this chapter taken from research paper, journals, web research that are related to the inquired topic and will be clearly cited. The possibility of the assistive development for the outwardly debilitated are not too obsolete. Thusly, there are a few examples are found related to this structure. All the past works related to this proposed system will be appearing in this chapter. The prefer point of view and lacking the errand will in like manner talk about here.

2.2 Research on Existing Project

2.2.1 Accident Detection and Reporting System using GPS, GPRS and GSM Technology

According to (Md. Syedul Amin, Jubayer Jalil, 2012), This system utilizes a capability about GPS that can monitor and tracked a speed of vehicle and accidents can be detected based on monitor speed to send an incidents to an Alert Service Center. Besides, it is additionally utilized microcontroller unit (MCU) that can get information from the GPS and procedures all the information and identifies the mishap from the handled information. The framework will also submit through the GPS-obtained where incident or collision happen close by period and therefore by frequency also use GSM greatness. Suffice to say, another virtual comprehensive framework is disproportionately costly and

difficult to enforce as both the settlement of cliched collectors and about at an extremely short interim are required.

Many researchers did their accident studies Screening program. Not at all like ordinary car crash forecast, ongoing auto collision expectation is identified with continuous traffic information gathered from different locators, for example, enlistment circles, infrared finder, camera and so on. The expectation of constant traffic episodes centres around changing traffic conditions before a mishap occurs, while traffic occurrence discovery contemplates are worried about changing the condition of the traffic after early crash. The presentation of this recognition and expectation framework is anyway significantly limited by the quantity of observing sensors, accessible reserve, calculations used to approve a mishap, situation, traffic stream and so forth.

Speed is the most common and crucial driving risk element. Not only does it affect the frequency of the accident but can also raises the risk of engaging in a collision. Persons actually need a time to determine whether to respond or not, before execute a fast hand with supporting action. Hence, at peak speeds, there is much longer time until braking system begin as well as full brake stand. Thus, braking time to velocity is equal to the huge disparity. And the probability of surviving a crash will become lower as speed arise fully to the max.

$$KineticEnergy = \frac{1}{2}mv^2$$

where m = mass of object and v = speed of the vehicle.

Figure 2.1 Formula Speed