UNIVERSITI TEKNIKAL MALAYSIA MELAKA

VEHICLE MONITORING AND TRACKING SYSTEM USING GSM

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor's Degree in Electrical Engineering Technology (Industrial Automation and Robotics) (Hons.)

By

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TAJUK: **VEHICLE MONITORING AND TRACKING SYSTEM USING GSM**

SESI PENGAJIAN: **2015/16 Semester 1**

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I hereby, declared this report entitled Vehicle Monitoring And Tracking System Using GSM

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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 in Electrical Engineering Technology (Automation Industry & Robotic) with Honours. The member of the supervisory is as follow:

…….

(Project Supervisor)

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ABSTRACT

Vehicle tracking system is becoming increasingly important in large cities and it is more secured than other systems. Nowadays vehicle thiefting is rapidly increasing, with this we can have a good control in it. This will cause, lost a lot of money and cars. GPS is one of the technologies that are used in a huge number of applications today. One of the applications is tracking your vehicle and keeps regular monitoring on them. This tracking system can inform the location and route travelled by vehicle, and that information can be observed from any other remote location. It also includes the web application that provides you the exact location of the target. This system enables us to track targets in any weather conditions. The main objective is to design a system that can be easily installed and provide a platform for further enhancement**.** This system uses GPS and GSM technologies. The project includes the hardware part which comprises of GPS, GSM, Atmega microcontroller, and software part is used for interfacing all the required modules. The expected result is able to develop a prototype of vehicle monitoring and tracking system using GPS. This tracking system can inform you the location and route travelled by vehicle and to develop full security system for vehicle

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ABSTRAK

Sistem pengesanan kenderaan menjadi semakin penting di bandar-bandar besar dan ia lebih selamat berbanding sistem lain. Pada masa kini kecurian kenderaan semakin meningkat dengan pesat, dengan ini kita boleh mempunyai kawalan yang baik di dalamnya. Ini akan menyebabkan, kehilangan banyak wang dan kereta. GPS adalah salah satu teknologi yang digunakan dalam sejumlah besar aplikasi hari ini. Salah satu aplikasi menjejaki kenderaan anda dan memastikan pemantauan berkala ke atas mereka. Sistem pengesanan boleh memberitahu lokasi dan laluan yang dilalui oleh kenderaan, dan maklumat yang boleh dilihat dari mana-mana lokasi yang jauh lain. Ia juga termasuk aplikasi web yang menyediakan anda lokasi sebenar sasaran. Sistem ini membolehkan kita untuk mengesan sasaran dalam mana-mana keadaan cuaca. Objektif utama adalah untuk mereka bentuk satu sistem yang boleh dengan mudah dipasang dan menyediakan platform untuk meningkatkan lagi. Sistem ini menggunakan GPS dan GSM teknologi. Projek ini termasuk sebahagian perkakasan yang terdiri daripada GPS, GSM, ATmega mikropengawal, dan sebahagian perisian digunakan untuk antara muka semua keputusan yang dikehendaki modul. Ianya dijangka mampu untuk membangunkan prototaip pemantauan kenderaan dan sistem pengesanan menggunakan GPS. Sistem pengesanan yang dapat memberi tahu lokasi dan laluan yang dilalui oleh kenderaan dan untuk membangunkan sistem keselamatan penuh bagi kenderaan

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DEDICATION

To my beloved parents

To my kind lecturers

And not forgetting to all friends

For their

Love, Sacrifice, Encouragement, and Best Wishes

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In completing this project, I have received a lot of helps from my supervisor, lecturers, researchers and family members and fellow friends.

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LIST OF SYMBOLS AND ABBREVIATIONS

GPS	=	Global Positioning System
GSM	=	Global System For Mobile Communication

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CHAPTER 1

INTRODUCTION

A GPS one of a device that uses the Global Positioning System to tracking, receiving or monitor a movement. GPS is devided into three types which is data pusher, data logger, data puller. In this project GPS data pusher have been used to find the right location of a vehicle, person, or other asset. As soon as the idea get the area the results might be stored from the pursuing model or perhaps it can be transmitted to central area info starting or perhaps internet- linked laptop or computer using a cell phone GSM or perhaps satellite modem. Soon after the idea get the latest area it will enable the area being show versus any map both in real time or perhaps any time analysing the actual observe in the future employing info pusher. Facts pursuing application is available pertaining to cell phones having GPS unit capacity. In checking, there are many situations in which a little one or perhaps newborn remaining inside a vehicle along with a lot of them are usually deadly situations .There are several situations exactly where vehicle thefts hide them selves from the car's backseat along with responded assault in the event the owner can be found in for the drive. Most of these reports generate any bottom line regarding owner's dangerous goal within checking out for almost any individuals remaining interior prior to following automobile are already parked. It is usually an organic behaviour when you consider that you will have zero any other individuals when the new driver seemed to be driving by yourself right from the start. On the other hand, cautiousness is still important the following as it will involve human being lifestyles.

1.1 Background

GPS is probably the engineering which might be utilized in a huge number of applications nowadays. On the list of applications is usually following a motor vehicle and

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also continues frequent checking about it. This particular following method may shows the placement and also route went by means of automobile, and this details is usually seen coming from any other rural spot. This technique allows us all to help monitor target in different conditions. This technique employs GPS and also GSM engineering. Rural module has a GPS installed on the actual going automobile to distinguish it is latest situation, also to end up being transported by means of GSM having other variables. On this challenge GSM likewise utilize pertaining to sensing inside motion in a very automobile. This technique may diagnose virtually any action or perhaps motion on the vehicle's inside and also educated the dog owner by means of delivering the SMS alert message.

1.2 Problem Statement

Vehicle tracking technique has grown significantly important with significant locations and it's also additional collateralized when compared with additional devices. Currently vehicle thiefting can be easily growing, using this you can possess a great handle within it. This will result in, missing lots of money in addition to automobiles. Through the use of law enforcement officials report is not successful, its carry significantly number of years in addition to human effort to help trail this ripped off automobile. Aside from of which, it will discover simply no device to assist mum or dad to get car or truck whenever their particular underneath age children use the car or truck without having permission. The automobile tracking technique of which is built to trail in addition to take care of the automobile by using a navigation tracking technology together with navigator.(Pankaj Verma and J.S Bhatia, 2013)

1.3 Objectives

i. To study a vehicle tracking system using GPS.
ii. To develop a GPS based tracking system for vehicle.
iii. To develop a monitoring system using GSM.

1.4 Work Scopes

In this project a several have been used. All this part have been choose based on specification, price, quality and funtion. A project involves several parts including :

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1.4.1 GPS Data Pusher

Data pusher it sends the position information of the followed question through a GSM Network. This transmission can be faciitated by ones use of that GSM modem along with a microcontroller.

1.4.2 GSM

The Global System for Mobile Communications Modem (GSM) is usually a second generation (2G) normal with regard to cell phone communities. GSM modem is usually a specific style of modem which in turn takes the SIM card, and functions over a ongoing to some cell phone operator, being a phone.

1.4.3 Arduino Mega 2560 R3

The Arduino Mega 2560 is a microcontroller board that have Atmega2560 on that board. Arduino Mega 2560 have more input/output pin (54 advanced pins and 15 pin can be utilized as PWM yields), 16 simple inputs, 4 UARTs (equipment serial ports). This microcontroller is chosen because its have TX and RX pin to connect to MAX232 and GPS.

1.4.4 MAX 232

The MAX232 is often a dual driver/receiver and typically converts your own RX, TX, CTS and RTS signals. your drivers required RS-232 voltage level outputs (approx. ± 7.5 V) from a individual + a few V be taken from on-chip charge pumps and external capacitors.

1.4.5 PIC16F877A

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PIC16F877A forms the heart of this system. It includes of clock circuit and power on reset circuit. This circuit determines the operating speed. This chip is picked because of its minimal effort and effectively found in practically any segment store.

1.4.6 Motion Detector

A motion detector is a gadget that identifies moving articles, especially individuals,which also known as PIR Motion Sensor. Motion detector is function to detect any movement and function based radiation of warm blooded moving object in its detection range. It has three pins (gate, drain and source).After it has detected IR radiation difference, a high is sent to the signal pin.

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CHAPTER 2

LITERATURE REVIEW AND PROJECT BACKGROUND

This section shows that the research have been done. In this chapter, the review was to arduino mega microcontroller, GPS, GSM, MAX232. Below are explanation about the previous study that had done.

2.1 Wireless Data Communication

Wireless Data Communication is the most important part for the project. It use the radio spectrum rather than a physical medium. It will acquire analog or digital notifications as well as can be utilized on LANs as well as WANs throughout one or perhaps two-way networks.

2.1.1 GSM Modem

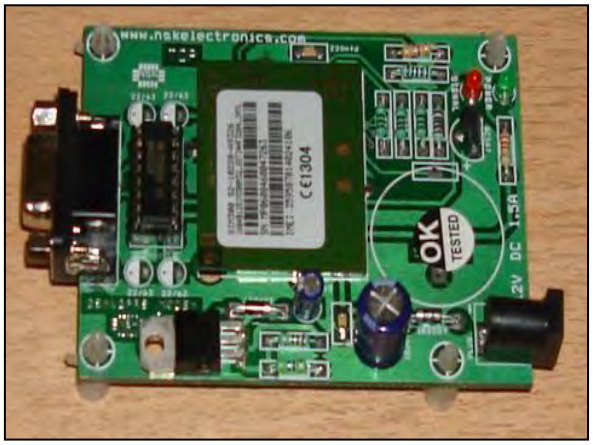

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Figure 2.1 : GSM Modem

GSM modem can be used regarding sending as well as receiving the details. GSM modem can be talk with 2 approach relationship practice that's transmitter as well as device. GSM modem afforded a new SIM greeting card employs identical letters. GSM common performs on about three different carrier frequencies: this 900 MHz group, that has been as used by the original GSM process, this 1800 MHz group that has been added to help this puffiness volume of subscribes plus the 1900MHz rate of recurrence which mainly found in U.S . This specific composition can be obvious to see, successfully installable, very easily wide open as well as may be used regarding different reasons. (Pankaj Verma and J.S Bhatia,2013)

2.1.2 Bluetooth

Figure 2.2 : Bluetooth Device

According to Sensor Protocol for Roaming Bluetooth Multiagent Systems.Neungsoo Park et. al (2013), it expresses that wireless bluetooth advancement has changed into a basic piece of that leading edge contemporary society. The particular availability associated with cell listen to music, enjoyment controllers, Individual Digital Helper (PDA) and also Computers offers built Wireless bluetooth any well known advancement with regard to brief variety remote distance learning. Involving the main advantages of Wireless bluetooth is usually sloppy,

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reliable, and also a force adept industry associated with back links with regard to interfacing electronic digital tools. Wireless bluetooth furthermore any short-go remote advancement outfitted with regard to presenting a lot of distance learning benefits.

Wireless bluetooth does not reinforce any sensor tradition, and that is discovered that has a meandering and also where handoff happens powerfully every time a Wireless bluetooth gizmo is usually going for more distance from the setting in the process. Wireless bluetooth advancement has turned into a essential bit of that leading edge contemporary society. The convenience involving mobile the radio, enjoyment controllers, Particular A digital Admin (PDA) and Computer systems possesses manufactured Wireless bluetooth a new popular advancement with regard to limited assortment rural letters.

Among the benefits of wireless bluetooth is actually shoddy, trustworthy, and a push skillful industry involving links with regard to interfacing electric gizmos. Wireless bluetooth furthermore a new short-go rural advancement outfitted with regard to supplying numerous letters benefits. Wireless bluetooth does not strengthen any sensor established practice, and that is recognized having a meandering and by which handoff transpires powerfully every time a Wireless bluetooth gizmo is actually shifting farther from your extent in the system.

It's extensively also been utilized in distinct electric devices. Be in which as it can, for the reason that Bluetooth advancement grows to end up being boundless, vulnerabilities inside the protection events are generally growing that is perhaps risky to the protection of any patient's near to house files. The protection concerns involving bluetooth are actually some sort of energetic area involving exam over the prior period.(Nateq Be-Nazir Ibn Minar and Mohammed Tarique,2012).

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2.1.3 Wireless Infrared Communication

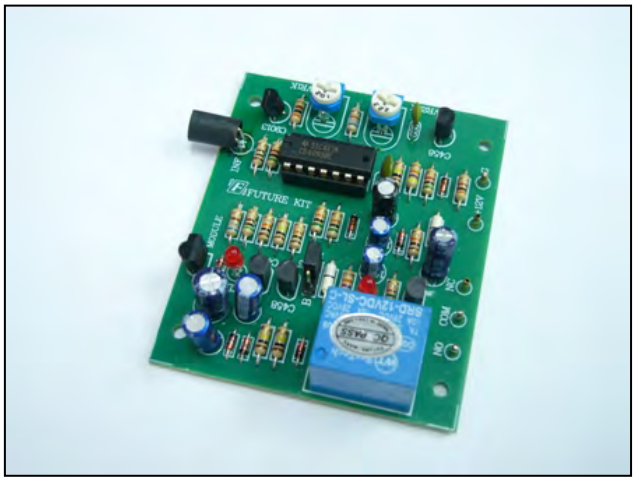

Figure 2.3 : Infrared

Figure 2.3 has shown Wireless Infrared. Wireless Infrared Communication are utilized for short separation system associations. It need observable pathway and have its merits and faults. The assessment of the two transmission frameworks was in the ranges of recurrence range, data transfer capacity, specialized issues, secrecy, security issues, separation scope. When recurrence range authorizing is troublesome and costly to get, wireless infrared communication have a decent point of preference, and the wireless infrared communication is less disposed to be caught. (Okeke et.al 2014).

Remote infrared interchanges alludes to the utilization of the free - space spread of light waves in the close infrared band as a transmission medium for correspondence. The correspondence can be between one compact specialized gadget and another or between a versatile gadget and a fastened gadget, called an entrance point or base station.(Prof .M. N. Zade et al,2013).

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Infrared correspondence with ease and straightforward control of the usage, simple to-utilize and transmission attributes of high unwavering quality, is a more regular method for correspondence. Infrared correspondence as a short-run remote interchanges, has been generally utilized. (Xiao Chen and Chenliang Wu, 2011).

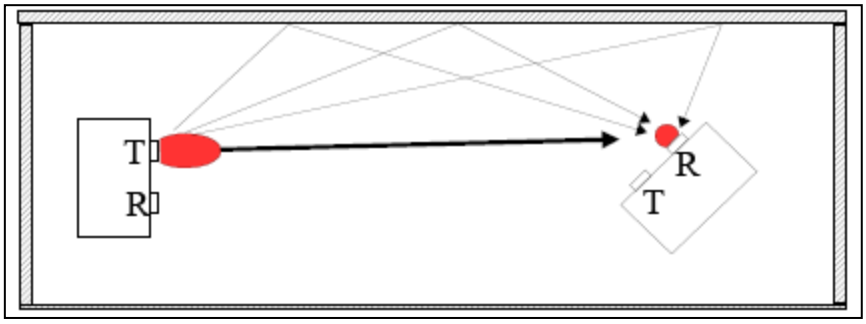

Figure 2.4 : Basic wireless infrared communication.(Prof. M. D. Nicose et al,2013).

2.2 Global Positioning System (GPS)

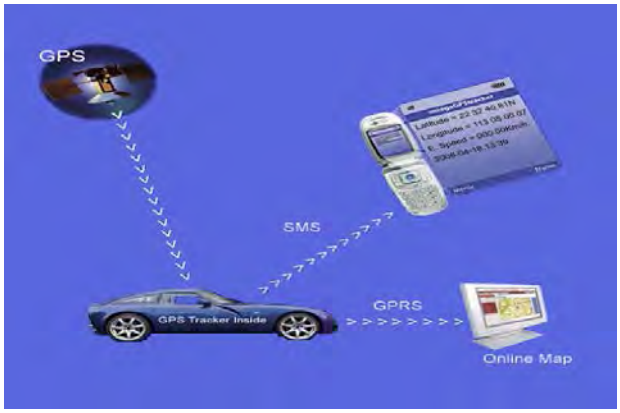

Figure 2.5 : GPS system overview

Global Positioning System(GPS). An arrangement of satellites, PCs, and collectors that has the capacity focus the scope and longitude of a recipient on Earth by figuring the time contrast for signs from distinctive satellites to achieve the beneficiary. Global Positioning System (GPS) innovation may give an intends to compute geographic range as a

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