VEHICLE SPEED SENSING

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Sesi Pengajian :

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SIGNATURE : ……………………………………..

NAME : MR. ZULHAIRI BIN OTHMAN

DATE : ……………………………………

To my beloved parents

Maumud Bin Daud and Ramlah Binti Hussein

My siblings

Asyikin Mahmud, Amiruddin Mahmud, Ikhwan Mahmud

My supervisor

Mr. Zulhairi Bin Othman

All of my friend

For their support, motivation and inspiration..

.

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ABSTRACT

This project is about designing and development Vehicle speed sensing is one of a project that develop in gated community area to control car speed by using Radio Frequency Identification and magnetic sensor in school area. This device is developing to warn a user of speed limit in school area. The main component of this project is PIC 16F877A to program the project. The magnetic sensors will summarise the speed of the vehicle and the speed will be display in the LED. If the limit is exceeded, the buzzer will turn ON. This project also uses RF Id to identify the type of vehicle and its plat number for display to LED. For the night version, the buzzer will not operate because the circuit has consisted LDR for night uses. The output of this system can be divided into two parts which are display mode and audio mode. For display mode, liquid crystal display (LCD) is used to display the speed of the vehicle based on condition that have been set. For audio mode, a buzzer is used to warn the driver about the speed if the drivers exceed the limit. The microcontroller analyses the signal, sends the command and measure the speed of the v e h i c l e s from first magnetic sensor until the car pass thru the second magnetic sensor. The measured speed is displayed on the LCD display. Advantages of this vehicle speed sensing are low cost, easy to manage and it also provides speed measurement compare to the existing device in the market

ABSTRAK

Projek ini bertujuan untuk membina sebuah sistem yang boleh memberi amaran kepada pengguna jalan di kawasan sekolah dalam kawasan berpagar. Projek ini menggunakan RFID sebagai pengesan nombor plate kenderaan manakala untuk mendapatkan kelajuan kereta ia mengguna sensor magnetic. Sensor magnetic ini diletakkan di dua tempat yang berbeza untuk mendapatkan kelajuan kereta dengan kaedah jarak bahagi masa.. Komponen utama dalam projek ini adalah PIC16f877A yang berfungsi sebagai otak yang mengawal program system ini. Jika kenderaan melebihi had laju, maka buzzer dan LED akan menyala dan paparan pada skrin LED akan terpapar nombor plat kenderaan beserta had laju kenderaan tersebut. Keluaran sistem ini boleh dibahagikan kepada dua bahagian iaitu mod paparan dan mod audio. Bagi mod paparan, paparan kristal cecair (LCD) digunakan untuk memaparkan kelajuan kenderaan berdasarkan keadaan yang telah ditetapkan. Bagi mod audio, penggera digunakan untuk memberi amaran kepada pemandu mengenai kelajuan yang jika pemandu melebihi had. Mikropengawal analisis isyarat, menghantar arahan dan mengukur kelajuan kenderaan dari sensor magnet pertama sehingga kereta melalui sensor magnet kedua. Kelajuan diukur dipaparkan pada paparan LCD. Kelebihan system ini adalah kos rendah, mudah untuk mengurus dan ia juga menyediakan pengukuran kelajuan berbanding dengan peranti yang sedia ada di pasaran

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATION

cm   –   centimeter

Hz   –   Hertz

LCD   –   liquid crystal display

IO   –   Input/output

PIC   –   Programmable interface controller

E   –   Enable

R/W   –   Read/Write

RS   –   Register select

CRT   –   Cathode ray tube

RFID   –   Radio frequency identification

CHAPTER I

INTRODUCTION

1.1   Project Introduction

Vehicles are the most important assets for human nowadays. Without vehicles it is hard to do their routine going to the place they want. But, in order to rush, users are forgetting about speed limit that has been stated especially in school area. As we know the speed limit of school area is 30KM/H which is mostly people know about it but just ignore it. Nowadays there are a lot of accidents cases occur in Malaysia. Every year the number of accident using cars increase. The biggest factor that cause the accidents happened is speed. Even though the government had limited the speed but driver just ignore the limit that have been state. To make citizen aware of their speed while driving is hard because everybody is busy chasing time.

This project considered is to develop a vehicle speed sensing to help drivers aware about the speed limit especially in school area. With this warning system, driver will know if they had exceeded the speed limits of school area. LCD display will be used to for display the warning for the driver. In this chapter will be state and explain the objective, problem statement, scope of project, significant of study and thesis organization for this project.

1.2 Objective

The objectives of this project are:

i. To develop a speed sensing system in school area
ii. To warn a road user whom exceed the speed limits from 25Km/H to 30Km/H in gated community area during school hours.

1.3 Problem Statement

Over speeding especially in school zone during school hours is both dangerous to perpetrator, school children and other road users. The speed limit in school zone is 25km/h to 30km/h during the school hours. Very often, the perpetrator is unaware that he or she has exceeded this speed limit, because they just speeding to other place without considering other road users.

After the learning session finish, student mostly just passing the road regardless of the vehicle speed. There also some of student whom like to chase each other by the roadside. So as a driver, we must be alert to this situation to avoid us knocking them. By speeding at the school area it not just dangerous to the children but also to the parent whom waiting for their children at the end of learning session. Some of them maybe use motorcycle, so if any accident happened it also may affect them.

There are many cases of accidents occurred because of over speed problems in school area. Examples of cases of the problem as follows:

1. Vehicle speeding front of the school [8]

KUALA NERANG - Ketiadaan garisan kuning keselamatan di hadapan Sekolah Kebangsaan Bukit Tampoi (SKBT) menimbulkan kebimbangan kepada waris murid akan kejadian kemalangan yang mungkin berlaku. Yang Dipertua Persatuan Ibu Bapa dan Guru-Guru (PIBG) SKBT, Saidi Hamid, 49, berkata, pihaknya berharap pihak berkuasa dapat meletakkan garisan keselamatan itu kerana bimbang dengan kenderaan yang melalui hadapan sekolah yang dipandu terlalu laju. Katanya, keadaan ini bertambah serius apabila lebuh raya dari Durian Burung ke Pokok Sena sudah hampir siap dan jalan semakin lebar menyebabkan banyak kenderaan yang melalui kawasan itu. "Kemalangan di kawasan itu sering berlaku tetapi sehingga kini belum ada lagi yang membabitkan kemalangan maut. Bagaimanapun PIBG mengharapkan pihak berkuasa dapat meletakkan garisan keselamatan supaya dapat mengurangkan kelajuan kenderaan di situ. "Jalan itu merupakan laluan utama dari Padang Terap ke Alor Setar dan ini menyebabkan pelbagai jenis kenderaan melaluinya," katanya. Sementara itu, bekas Yang Dipertua PIBG SKBT, Osman Yasin berkata, masalah ini sudah dimaklumkan kepada pihak berkuasa sejak lima tahun lalu tetapi sehingga sekarang tiada sebarang tindakan diambil. Menurutnya, sehingga kini tidak ada papan tanda memaklumkan kepada pengguna jalan raya di situ bahawa terdapat murid sekolah melintas. "Memang kecewa kerana tiada maklum balas dari pihak berkuasa kerana kenderaan yang lalu di situ sangat laju apatah lagi jalan itu sudah dinaiktarafkan sebagai lebuh raya. "Oleh itu saya merayu kepada pihak bertanggungjawab supaya dapat meletakkan garisan keselamatan demi murid di sekolah itu," katanya.

2. Form 4 students' dead after send his friend to school [9]

DUNGUN – Seorang pelajar tingkatan empat tidak mungkin melupakan tragedi sahabatnya maut dirempuh kereta Perodua Kancil selepas menghantarnya ke sekolah di Kilometer 73.9, Jalan Kuala Terengganu-Kuantan semalam. Dalam tragedi pada pukul 7.20 pagi di hadapan Sekolah Menengah Teknik di sini, Ahmad Zikri Zaharudin, 16, pelajar tingkatan empat itu meninggal dunia di tempat kejadian selepas menghantar rakan sebayanya, Muhammad Faizal Yusri Mohd. Shaali ke sekolah itu. Kejadian tersebut berlaku selepas Faizal turun daripada motosikal di depan sekolah manakala mangsa pula sedang membuat pusing U untuk pulang. Cerita Faizal, mangsa yang tinggal sekampung dengannya di Kampung Balai Besar kira-kira dua kilometer dari sekolah tidak ke sekolah semalam kerana demam. Bagaimanapun, dalam keadaan tidak sihat mangsa berkeras menghantar Faizal ke sekolah.

1.4   Scope of Project

The scope of this project is focus on the gated community area especially school area, to alert road user while driving in the school area within the speed limit 30Km/h to 40Km/H during school hours:

i.   To detect over speeding outside the speed limit 25km/h to 30km/h during school hours in a gated community

ii.   To alert over speeding LED,LCD display and sound alarm

1.5   Significant of Study

From the perspective of society, this project will make some useful for their life. With mean this project can help the society alert of the speed in school area. Also

that may reduce the quantity of accident in school area involving student and road users. By using LCD display to display the plate number of vehicle so, the users will know they had exceeded the speed limit. Furthermore, this project is a low cost project because it using few components and circuit.

1.6 Thesis Organization

This project is divided into five chapters, which are:

Chapter 1 will explain about the project overview with mean the purpose of this project develop, why this project develop, scope of study and significant of study.

Chapter 2 will discuss the past research that related with this project. Moreover, in this chapter will explain more about the method-method was been using and develop from the past research. Also that, it also discuss the theory of component-component will been using for this project.

Chapter 3 will be discussing the flow chart for this project. Also that, the functional component-component was involved on this project will be explained.

Chapter 4 will show the student observation in this project. Data analysis will be determined and state in this chapter to gives overview of result this project.

Chapter 5 will discuss conclusion and recommendation for this project. With mean it this chapter; some suggestion will be proposed to improve this project for future work.

CHAPTER 2

LITERATURE REVIEW

2.1   Literature review overview

The theory and description plus details about the project have taken as guidance in completing this project. By this chapter, an overview of some application that similar to the project and related project design is present.

2.2   Previous Research on Vehicle Speed Sensing

The vehicle speed is one of the most important traffic parameters. There a lot method that have been developed to alert the drivers about the vehicle speed. Recent

research have identified several methods for vehicle speed sensing and they are using wireless sensor nodes.

2.2.1 Wireless Sensor Nodes

"Vehicle Speed Measurement using Wireless Sensor Nodes" by Pelczar. C at al (2008) [11] . In this journal they are discussing about capable of wireless sensor nodes replace the traditional speed measurement system such dual loop detector. This journal focuses on sensor separation and velocity measurement influent the speed measurement. Wireless sensor nodes for measurement have potential to become an inexpensive alternative to conventially use speed measurement systems such dual loop detector or radar because of the lower installation cost. Fig 2.1 is structure of sensor fo this journal
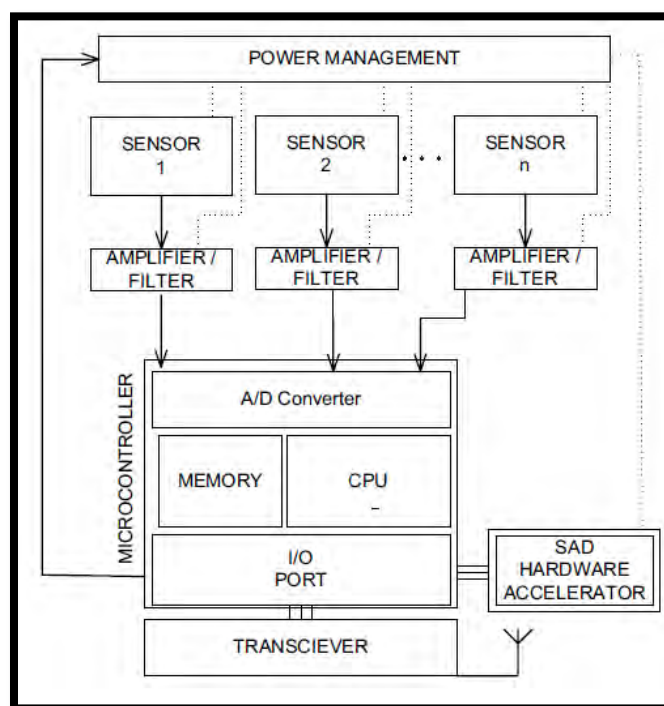

Figure 2.1: Structure of Sensor

Md. Sazzad Hossen and friends proposed "Consistency Analysis of RSSI Measurement for Distance Estimation of Wireless Sensor Nodes". This journal is about assuming the strong parameter for Received Signal Strength Indicator (RSSI) in order to determine of sensor nodes. But it is found that lots of irregular values of RSSI are produced at different conditions.

2.3 Microcontroller

PIC 16F877A is one of Microchip microcontroller (MCU) family, consisting of a microprocessor, I/O ports, timer(s) and other internal, integrated hardware. The main advantages of using the PIC are low external part count, a wide range of chip sizes available, nice choice of compilers (assembly, C, BASIC, etc.) good wealth of example/tutorial source code and easy programming. It can operate at maximum clock input of 20 MHz with 8k words of Flash Program Memory, 368 bytes of Data Memory (RAM) and 256 bytes of EEPROM Data Memory. The operating voltage range is 2.2 V to 5.5 V and has some features includes Universal Synchronous Asynchronous Receiver Transmitter (USART), Timer/Counter and so on.

The great advantage of microcontrollers, as opposed to using larger microprocessors, is that the parts-count and design costs of the item being controlled can be kept to a minimum. They are typically designed using CMOS (complementary metal oxide semiconductor) technology, an efficient fabrication technique that uses less power and is more immune to power spikes than other techniques.

Early controllers were typically built from logic components and were usually quite large. Later, microprocessors were used, and controllers were able to fit onto a circuit board. Microcontrollers now place all of the needed components onto a single chip. Because they control a single function, some complex devices contain multiple microprocessors.

Microcontrollers have become common in many areas, and can be found in home appliances, computer equipment, and instrumentation. They are often used in