UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF MULTILEVEL CAR PARKING SYSTEM BASED ON CAR SIZES

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

by

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APPROVAL

This report is submitted to the Faculty of Electrical and Electronic Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electrical Engineering Technology (Industrial Power) with Honours. The member of the supervisory is as follow:

Signature: …….

Supervisor : Ts. Ahmad Muzaffar Bin Abdul Kadir

ABSTRAK

Sistem letak kereta adalah sistem yang digunakan di kawasan bandar sebagai salah satu kaedah untuk mengatasi masalah sistem sistem parkir yang tidak sistematik. Di samping itu, sistem parkir yang disediakan adalah tidak selesa untuk semua pengguna kenderaan kerana terdapat pelbagai saiz kenderaan yang digunakan setiap hari. Untuk menyediakan sistem parkir yang lebih baik, pembangunan sistem letak kereta bertingkat yang berdasarkan saiz kereta dilaksanakan. Idea utama projek ini adalah untuk mengoptimumkan ruang yang disediakan untuk kenderaan di sistem letak kereta dengan membezakan tempat letak kereta dari saiz tempat letak kereta. Ketinggian dan lebar kenderaan itu akan dibezakan di bahagian awal platform kemasukan sistem letak kereta dengan menggunakan Sensor Inframerah. Arduino Mega digunakan sebagai mikrokontroler projek ini namun sistem programnya dikawal oleh perisian komputer iaitu perisian LabVIEW. Di samping itu, projek ini juga melaksanakan sistem pembayaran parkir mengikut saiz kenderaan. Saiz kereta yang lebih besar, sederhana dan kecil akan diletakkan pada tahap yang berbeza dari sistem parkir. Pembayaran sistem letak kereta akan berbeza mengikut tahap tempat letak kereta. Projek ini juga bertujuan untuk memantau aliran masuk dan keluar kenderaan di tempat letak kereta untuk pemeriksaan ketersediaan ruang.

ABSTRACT

Car parking system is a system that are used in urban area as one of the medium to overcome the problem regarding the unsystematic parking system. In addition, the parking system that is available is not comfortable for all vehicle user as there are various sizes of vehicle used every day. In order to provide a better used of parking system, a development of multilevel of car parking system based on car sizes are implemented. The main idea of the project is to optimize the space provided for vehicle in car parking system by differentiate the car parking from the size of the parking. The height and width of the vehicle are diagnose at the entry platform of the car parking system using Infrared Sensor. The Arduino Mega are used as the microcontroller of the project but the program of the project will be controlled by the program in the LabVIEW software. Then, this project also implemented a smart parking fare system that follow the vehicle size. The bigger, medium and small size of the car will parks on the different level of the parking system. The payment of the car parking system will be differs according to the level of the parking. This project also aims to monitor the inflow and outflow of vehicle in the car park for space availability check.

DEDICATION

To my beloved parents,

Abidin Bin Che Ramli, my father

Ainon Bt Osman, my mother

My supervisor

Ts. Ahmad Muzaffar Bin Abdul Kadir

To all lectures

And not forgetting to all my dear friends

Without the

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Praise to Allah I able to complete the final year project with successful and smooth sailing. A very grateful of help from my supervisor Ts. Ahmad Muzaffar Bin Abdul Kadir that guide me all the way in the process of this final year project. Without the guidance from my supervisor, the process in completing this project will not be as smooth as this.

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mm	-	Millimetres

LIST OF ABBREVIATIONS

CCTV	-	Close Circuit Television
ICSP	-	In Serial Circuit Programming
IDE	-	Integrated Development Environment
IR	-	Infrared Sensor
LCD	-	Liquid Crystal Display
MHz	-	Megahertz
MPV	-	Multi-purpose Vehicle
PWM	-	Pulse Width Modulation
SUV	-	Sport Utility Vehicle
UR	-	Ultrasonic Sensor
USB	-	Universal Serial Bus
VIs	-	Virtual Instruments
USB	-	Universal Serial Bus

CHAPTER 1

INTRODUCTION

1.1 Introduction

The main purpose of this chapter is to introduce what is the title of the research which is Development of Multilevel of Car Parking System Based on Car Sizes, background information, objective and scope of these study.

1.2 Background

Transportation is the important things in human works and activities. It is an irreplaceable segment of the economy and assumes a noteworthy part in spatial relations between areas. Transportation is one of the communication medium for economic activities and to bond a different region, and society. (Rodrigue et. al). The important of transportation has increase the number of vehicle that is been sold by every vehicle company as they compete for their company sale. Due to the increase in the number of cars nowadays has cause a problem for placing their vehicle safely in public area. The ineffective organisation of parking space in public area also one of the reason that leads to these problem.

Parking space is one of the things that need to be alerted before planning a journey. An organised parking, and adequate parking for the user and good planning parking space is one of the key of the successful of an urban area. A problem regarding insufficient parking will leads to the frustration to the user of the parking space that eventually makes the user park the vehicle not according to the standard that causes a difficulties for the other user. These problem of parking may interrupt other user to use the same facilities. According to Wang and He, (2011) to overcome the problem regarding insufficient parking for vehicle, a system called smart parking system is implement to solve and satisfy the user. A smart parking system between parking service provider that interact with user have been developed.

1.3 Problem statement

Nowadays, the number of vehicle on the road are increasing due to the demands in transportation for human daily needs. These leads to the higher demands in public parking to park the vehicle at a time. A lot of time are wasted to find an empty and suitable parking lot especially during peak hour of the day. Usually the peak hour in the morning from 7.00 am to 8.30 am and peak hour during lunch hour from 12.30 am to 2.00 pm. This will leads to unproductive day for the workers and student especially if their day start with hardship of finding the suitable parking. The parking that are left empty usually are in a small size of lot parking. The bigger car size user usually have these kind of problem in finding the suitable lot of parking that is comfortable and safe to park their vehicle. The parking lot that are provided usually are just fit for their size and it may leads to bump with the car that is parked next to it. But, when a bigger size car user parks their car in the

parking lot given, it also cause a problem for a smaller size car as their view of road has been blocked by the bigger car.

1.4 Objective

1. To optimize the space provided for vehicle in car parking system by differentiating car sizes
2. To implement a smart parking fare system that follow the vehicle size.
3. To monitor the inflow and outflow of vehicle in the car park for space availability check.

1.5 Scope

This study will be focused on the optimizing space of car parking system in the city area. The main target of the project is aiming toward the parking system of the city workers. This project is implement in order to provide a suitable space of parking for each size of vehicle with fair price of the parking. The space of the parking system will be used to its maximum as to achieve the objective of the project.

1.6 Project Outline

Phase 1

In this phase, the problem statement, background and objective will be listed. The review on the project main idea which is different size of car, type of parking available and the previous journal will be the done in this phase. The comparison of the hardware to be used in the project is going to be analyse in this phase.