# UNIVERSITI TEKNOLOGI MARA CAWANGAN PULAU PINANG

# DESIGN AND IMPLEMENTATION CAR PARKING ALLOCATION SYSTEM OF FPGA AND VLSI DIGITAL ASIC

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July 2017

# ABSTRACT

The number of vehicles on the road increase rapidly for the past 5 years. Due to the increment trend, there are various problems faced due to the limited parking area at public location such as shopping complex, hospital and government building. One of the main problem is the improper allocation management system, this is an issue that must be solved. This proposed system able to help management to install a smart car parking allocation method at a minimum cost. This system able to indicate available and unavailable parking area in a low cost by using a few number of sensors and some buttons at enter and exit gate. This project able to make whole process of car parking allocation more efficient and less complex. In other word, this system ease the user to search an available parking lot and to facilitate the management process. The car parking allocation system is proposed to demonstrate 6 slots display and 20 empty parking lots at each level. The slot are referring to the level and wing that will selected by the user at the parking slot display located at the main entrance. The function of parking slot display are to notify user the availability of parking lot at which level and wing. The available or unavailable of the parking lot at the parking slot display shows by (Light Emitting Diode) LEDs and push button are for user select. The parking lot are divided to two wing which every wing consist of 10 parking lot. The number of parking lot are decided by the system based on the nearest parking lot available to the building entrance, the concept of first come first serve is used. This system implemented using (Field Programmable Gate Array) FPGA board and (Very Large Scale Integration) VLSI digital (Application Specific Integrated Circuit) ASIC flow for presenting the interfacing between software and hardware.

# ACKNOWLEDGMENT

First and foremost, I would like to express gratefulness to Allah S.W.T for giving me the strength to complete this final year project entitle Design and Implementation of Car Parking Allocation System on FPGA And VLSI Digital ASIC. I pray to Allah hoping this project journey is in His bliss and hoping that this project will successfully done. In this opportunity.

I would like to express my deepest appreciation to my supervisor, Mrs. Nor Shahanim binti Mohd Hadis for being a great adviser that keeps support, guide and teach me for a knowledge throughout developing this project.

Besides that, I also would like to extend my thankfulness to my friends for never ending reminding me to always be vigorous and support throughout finishing this project.

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# INTRODUCTION

## 1.1    BACKGROUND OF STUDY

Due to the technological, there are several innovation make for a comfortable life[1]. Even at the same time, these advancements can become a troublesome[1]. The number of people using their own car has increased nowadays, then this increment can be related to the car parking space especially at the big cities or public location such as shopping complex, hospital and government building. The desperate for finding the parking spots also enhances to the problem of chronic traffic congestion and choking pollution [2-4].

There are two type of car parking system which is conventional parking systems and automated parking system. The conventional parking systems do not have any smart monitoring system and the parking lots are supervised by security guards. The example of this system are on street parking which the vehicle are usually parked on the street itself. Generally, these parking spaces are controlled by government whereby parking coupons are provided to park in some of these parking spaces. This situations become worse when there are multiple parking level and each level with multiple parking lots. By looking to the automated parking system that provided now, the system created just only display the number of empty parking lot that available in front the entrance. Therefore, the user do not know where the level that have empty parking space or the user can not know either the parking lot far or near from the building entrance. Then, the user need to find the empty parking space without any information of the car parking space. A lot of time is wasted in searching vacant slot for parking and many at times it creates jams [5].

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