DESIGN AND DVELOPMENT OF SMART CAR PARKING SYSTEM USING ARDUINO AND ANDROID

CHANG JIAN FEI

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Faculty of Manufacturing Engineering
Universiti Malaysia Pahang

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ABSTRACT

In Malaysia, there are too many shopping complex and every shopping complex also has own car park. Somehow they have the similarity which is the car parking system is not complete yet. One of the major problem is the driver have to patrolling around to search for empty car park. This is very wastes of time and fuel. Therefore, the thesis will explain how to improve the existing car parking system to reduce the pain of wasting time and fuel. The system consists of few sub system one of them is the smart management in car parking lot. The driver will get to know where is the empty car park that shown in the LCD at the entrance. Besides that, the security of a car park is very important too. In the system, there is a design and development of a spike system to protect the car. The spike will be activated once the car is parked. Due to the traditional car parking system normally are two color LED which is green and red. Green represent available and red stand for occupied. In the system, it is added a new blue LED to indicate the driver is going to leave the car park soon. Moreover, the blue color light can act as to give direction to the driver where they have park the car. Moreover, there is a little enhancement in the payment system, the driver can make the payment through android app but this system is conceptual due to using the connectivity of Bluetooth. Therefore, it has it limitation. This system can be improve more using web based or PHP base. So this method is indirectly help the driver get to their car fast and easy. Hence, this system can be applied to most of the car park.

ABSTRAK

Di Malaysia, komplex-komplex memiliki tempat letak kereta sendiri. Mereka mempunyai persamaan iaitu sistem tempat letak kereta tidak lengkap. Salah satu masalah utama adalah pemandu perlu mencari tempat letak kereta di sekitar. Ini adalah sangat membazir masa dan bahan api. Oleh itu, tesis ini akan menerangkan bagaimana untuk memperbaiki sistem tempat letak kereta yang sedia ada untuk mengurangkan kesakitan membuang masa dan bahan api. Sistem ini terdiri daripada beberapa sub system, salah seorang daripada mereka adalah pengurusan pintar di tempat letak kereta kereta. Pemandu akan dapat tahu di mana adalah tempat letak kereta yang kosong yang akan ditunjukkan dalam LCD di pintu masuk. Selain itu, keselamatan tempat letak kereta adalah elemen sangat penting juga. Dalam sistem ini, terdapat sistem spike untuk melindungi kereta. Sistem spike ini akan diaktifkan apabila kereta itu diletakkan. Selain it,sistem letak kereta tradisional biasanya ada dua warna LED yang berwarna hijau dan merah. Hijau mewakili tempat letak keretu itu kosong dan merah mewakili tempat letak kereta itu telah diisi. Dalam sistem itu, LED biru telah ditambah ke dalam sistem untuk menunjukkan pemandu yang letak kereta di tempat itu akan meninggalkan tempat letak kereta tidak lama lagi. Selain itu, cahaya warna biru boleh bertindak untuk memberi arahan kepada pemandu di mana mereka mempunyai meletak kereta. Jadi kaedah ini secara tidak langsung membantu pemandu mendapatkan untuk kereta mereka cepat dan mudah. Selain itu, terdapat peningkatan sedikit dalam sistem pembayaran, pemandu boleh membuat bayaran melalui android app tetapi sistem ini adalah konsep kerana menggunakan kesambungan Bluetooth. Oleh itu, ia mempunyai had. Sistem ini boleh meningkatkan lagi menggunakan asas berasaskan web atau PHPOleh itu, sistem ini boleh digunakan untuk sebahagian besar tempat letak kereta.

CHAPTER 1

INTRODUCTION

1.1 Overview

By referring the name of smart parking system, drivers are supposing to get the parking lot easy and without the feeling of frustration but the true story is always not what we expected. The main reason of it is because the system name is smart but the guidance mechanism is not complete and efficient enough. Moreover, there are some parking system do not even have any guidance mechanism it is due to the extra cost that have to bear by the owner. As a consequence of increased the level of difficulty for the driver to seek for car park lot.

Here is some example that normally face by all the Malaysian driver who intended to find a car park. First of all, the ticket is still available for the driver although the car park is full and causes the drivers seek more time to patrolling around. Secondly would be the lack of indication to the free parking lot. Next issue is the drivers simply park their vehicles at any place they like which might block the loading bay and cause the pathway of the car park become narrow. There is many more issue that arises by the driver but the point that listed is the most critical issue that needs to be solved.

In my project, I will be focusing on the security of the car park system, slightly improve of the guidance mechanism. The guidance mechanism is to be built to guide the driver to the empty parking lot in a short time without any feeling of fuss and hassles. Sometime, drivers are confused that the car park bay is just been occupied or the driver is wish to leave the car park slot. Therefore, the slightly improvement of the

car park will be a color of indicator LED will show that the driver is just make payment and leaving the parking slot soon. Besides that, the security system is built to ensure the car is not being steal and CCTV is install in the sectional parking area so that the driver can view the car park condition before they get the car and check the car status while shopping in the mall.

1.2 Problem Statement

There are many car parks available in Malaysia; however the security system and the guidance mechanism of these parking systems are neither smart nor efficient enough to operate the car park. Therefore, these systems are not efficient in terms of both time-to-park and guidance mechanism, that is waste of time and fuel yet increase the crime rate.

1.3 Objective

1. Design a car park modal..
2. Develop a smart car parking system and improve the existing car park guidance mechanism.
3. Develop an android application for the payment and real time monitoring.

1.4 Project Scope

Arduino is chosen as the Microcontroller which is act to communicate with the sensor and PC.

1.5 Thesis Outlines

Smart and security based car parking system final thesis consists of 5 chapters. Each chapter will explain different part of the project in details.

Chapter 1: Introduction of the project. This chapter is briefly provides a general overview of this project in order to introduce the purpose and idea for the project. This chapter consists of introduction problem statement, objective, project scope and thesis outline.

Chapter 2: Literature review. This chapter provides literature reviews on the car parking system which are smart and using LED as indicator that been done by previous researcher and some case study related to the car parking system.

Chapter 3: Methodology. This chapter describes the flow of the parking system from the beginning at the entrance until the driver get to the empty parking bay.

Chapter 4: Result and discussion. This chapter presents the result and discussion of the project. The result of the car park system will be display in with hardware and some picture of some for some specific result to achieve the objective.

Chapter 5: Conclusion and recommendation. This chapter provides a general conclusion based on project status. The problems encountered and findings of this project also will be mentioned in recommendation part.