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PREFACE

Bismillahir rahmanir Rahim,

Assalamu'alaykum Warahmatullahi Wabarakatuh

Praise be to Allah Subhanahu wata'ala, sholawat and greetings continually abound to Prophet Muhammad Sallahu'alaihi wassalam.

The writer realizes that the coaching of this very last document cannot be separated from the help, guidance and help of diverse events.

Therefore, with all humanity, the writer would love to thank;

1. Allah subhanahu wata'ala.
2. My family who continually offer ethical and massive support
3. *Mr Muhammad Asyraf Bin Zulkipli* as my mentors who've guided me to finish my very last venture
4. *Mr Muhammad Hamdi* as the evaluator who has furnished an assessment in order that I can whole my very last venture
5. Lecture of Mechanical Engineering on the *Jakarta State Polythenic* and FISE MSU which I cannot point out separately
6. Friends from Jakarta State Polytechnic for the encouragement.
7. My comrades in hands who've followed me, thanks on your encouragement and cooperation while doing this very last studies.

Finally, the writer hopes that this document may be used well and may be beneficial for all of us. And the writer would love to thank diverse events that I cannot point out separately who've helped me in finishing the studies of this very last document. Hopefully what I even have performed up to now is beneficial for all.

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SMART PARKING LOCATION TRACKER USING RFID AND ANDROID APPS

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ABSTRACT

Abstract of the Project presented to the Senate of Management & Science University in partial fulfilment of the requirements for the degree of Bachelor Of Science in Mechanical Engineering (Hons).

SMART PARKING LOCATION TRACKER USING RFID AND ANDROID APPS

By

RAFIF FAIRUZ BACHRI

JANUARY 2023

Faculty: Information Science and Engineering

Parking lots are very important facilities in shopping centers, offices, and others. The size of the parking area and the large number of vehicles in the parking area cause difficulties for users to find parking for vehicles and find empty parking spaces. Smart parking location tracker using RFID and Android apps provides a solution for drivers to quickly find a vehicle and find an empty parking space. In this study, Smart Parking Location Tracker Using RFID and Android Apps uses the Arduino Uno R3 microcontroller based on RFID and the MifareRC522 Module owned by RFIDtag, uses RFIDtag as a ticket replacement and uses NodeMCU as a link between the application and the microcontroller. The Reflective IR sensor is used as a notification if there is still an empty parking space and the empty parking space data is displayed on the LCD door block. The results showed that the success rate of sending data and sensor readings reached 100%, the reader parking space was empty 100%, and the testing of RFID information still experienced problems in the coding of the microcontroller program.

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ABSTRAK

Abstrak tesis yang dikemukakan kepada Senat Management & Science University sebagai memenuhi sebahagian keperluan untuk ijazah Bacelor Sains Mekanikal (kepujian).

SMART PARKING LOCATION TRACKER USING RFID AND ANDROID APPS

Oleh

RAFIF FAIRUZ BACHRI

JANUARI 2023

Fakulti: Sains Maklumat dan Kejuruteraan

Tempat letak kereta adalah kemudahan yang sangat penting di pusat membeli-belah, pejabat, dan lain-lain. Saiz kawasan parkir dan bilangan kenderaan yang banyak di kawasan parkir menyebabkan pengguna sukar untuk mencari tempat letak kenderaan dan mencari tempat parkir yang kosong. Penjejak lokasi letak kereta pintar menggunakan apl RFID dan Android menyediakan penyelesaian untuk pemandu mencari kenderaan dengan cepat dan mencari tempat letak kereta yang kosong. Dalam kajian ini, Penjejak Lokasi Tempat Letak Pintar Menggunakan RFID dan Aplikasi Android menggunakan mikropengawal Arduino Uno R3 berasaskan RFID dan Modul MifareRC522 yang dimiliki oleh RFIDtag, menggunakan RFIDtag sebagai pengganti tiket dan menggunakan NodeMCU sebagai penghubung antara aplikasi dan mikropengawal. Penderia IR Reflektif digunakan sebagai pemberitahuan jika masih terdapat ruang parkir kosong dan data ruang letak kereta kosong dipaparkan pada blok pintu LCD. Keputusan menunjukkan bahawa kadar kejayaan menghantar data dan bacaan sensor mencapai 100%, ruang parkir pembaca kosong 100%, dan ujian maklumat RFID masih mengalami masalah dalam pengekodan program mikropengawal.

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Table Of Contents

PREFACE 3
PENGISYTIHARAN 4
ABSTRACT 6
ABSTRAK 7
ACKNOWLEDGEMENTS 8
Table Of Contents 9
List Of Figure 12
List Of Table 13
CHAPTER I 14
INTRODUCTION 14
1.1 PROFILE BACKGROUND 14
1.2 PROBLEM STATEMENT 14
1.3 OBJECTIVE 14
1.4 SCOPE OF PROJECT 15
1.5 SIGNIFICANT OF PROJECT 15
1.6 LIMITATION 15
CHAPTER II 16
LITERATURE REVIEW 16
2.1 REVIEW OF CURRENT SITUATION 16
2.2 REVIEW OF CURRENT SITUATION 16
2.2.1 RFID-BASED VEHICLE POSITION PREDICTION SYSTEM IN PARKING AREA 17
2.2.2 Car Parking Monitoring System uses Infrared Sensor based on RASPBERRY PI 17
2.3 REVIEW OF RELATED LITERATURE 18
2.3.1 Introduction Of RFID 18
2.3.2 RFID Tag 18
2.3.3 RFID Reader 20
2.4 REVIEW OF RELATED PRODUCTS 20
2.4.1 Vehicle parking system using E-Money and E-KTP 20
2.4.2 Auto Door Gate 22
CHAPTER III 23
RESEARCH AND DESIGN METHODOLOGY 23
3.1 Project Methodology 23
3.2 Development Methodology 24

3.2.1 RFID Reader Circuit 24
3.2.2 Mifare RC522 RFID Circuit 25
3.2.4 NodeMCU . Wifi Module Circuit 25
3.2.5 Information RFID Circuit 26
3.2.6 Circuit 16x2 LCD 27
3.2.7 Reflective IR sensor circuit 27
3.3 Tools and Hardware 28
Arduino Uno R3 29
Modul Mifare RC522 RFID 29
LCD 20x4 29
3.4 SOFTWARE REQUIREMENTS 31
3.5 Block Diagram 32
3.6 Flow Chart 32
CHAPTER 4 34
RESEARCH AND DISCUSSION 34
4.1 Overview 34
4.2 System development 34
4.2.1 RFID implementation 34
4.2.2 Implementation of RFID Information 35
4.2.3 Empty Parking Space Reader Implementation 35
4.2.4 Mini Prototype 36
4.3 Booking Parkir App 37
4.3.1 User Interface 37
4.3.2 Application Loading Display 37
4.3.3 Login Option As User and Admin 38
4.3.4 Home Login Page For Parking Slot 38
4.3.5 Register Page 39
4.3.6 Detail Parking Slot 39
4.3.7 Ticket Page 40
4.3.8 Logout User 40
4.3.9 Login For Admin 41
4.3.10 Parking Dashboard 41
4.3.11 Logout For Admin 42
4.4 Testing 43
4.4.1 Testing Without Application 43
4.4.2 Testing With Application 45
4.5 Programming 48

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CHAPTER 5 49
RECOMMENDATION AND CONCLUSION 49
5.1 Conclusion 49
5.2 Recommendation 49
Reference 50
APPENDIX I 51

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List Of Figure

Figure 2 1 Vehicle parking system using E-Money 20
Figure 2 2 Auto Door Gate 21

Figure 3.1 the circuit of the RFID Reader 24
Figure 3.2 Mifare RC522 RFID Circuit 24
Figure 3.3 ESP 8266 . Wifi module circuit. 25
Figure 3.4 Circuit Information Reader 26
Figure 3.5 Arduino Uno R3 circuit and a 16x2 LCD 27
Figure 3.6 Reflective IR sensor circuit 28
Figure 3.7 Design of Mini Prototype 31
Figure 3.8 Block Diagram 32
Figure 3.9 Flow Chart Illustration 33

Figure 4.1 RFID tag reader hardware 35
Figure 4.2 NodeMCU for connection link between Arduino and the smart parking application Reflective IR Sensor 35
Figure 4.3 Reflective IR sensor 35
Figure 4.4 LCD for output 35
Figure 4.5 Mini Prototype 35
Figure 4.6 Booking Parkir Application 37
Figure 4.7 Application Loading Display 37
Figure 4.8 Login Option as User or Admin 38
Figure 4.9 Parking Slot Page 38
Figure 4.10 Register Page 39
Figure 4.11 Detail Parking Slot 40
Figure 4.12 Ticket Page 40
Figure 4.13 Logout Page 41
Figure 4.14 Login for admin page 41
Figure 4.15 Parking Dashboard 42
Figure 4.16 Logout For Admin 42
Figure 4.17 Module MIfare RC522 and 9g Servo Open The Portal 44
Figure 4.18 The LCD will direct to the parking slot P1 44
Figure 4.19 Put a miniature toy car in the P1 parking lot 44
Figure 4.20 The output will display the number 1 on the LCD which means the parking lot has been filled. 44
Figure 4.21 The LCD will direct to the parking slot P2 45
Figure 4.22 View of the parking booking application on the Android mobile page 45
Figure 4.23 Login User Page 46
Figure 4.24 Dashboard user to select the parking lot 46
Figure 4.25 Detail Slot for Accept Booking Parkir 46
Figure 4.26 Output from LCD after user confirm booking parking slot 47
Figure 4.27 User parking ticket display on the "my ticket" menu……...46

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List Of Table

Table 2.1 RFID tags comparison 20
Table 3.1 shows the tools and hardware used 28
Table 3.2 shows the hardware used in the project 30
Table 3.3 shows the software used in the project 31
Table 4.1 Software 48

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CHAPTER I

INTRODUCTION

1.1 PROFILE BACKGROUND

Parking is a very important facility in shopping centers, offices, and others. The large parking area and the number of vehicles in the parking area cause parking users to have difficulty finding vehicles and finding empty parking spaces. The vehicle position prediction system in the parking area provides a solution for motorists to find vehicles quickly and find empty parking spaces.

In this study the system for predicting the position of vehicles in the parking area uses an Arduino Uno microcontroller based on RFID, an RFID reader as an RFID tag owned by UID, an RFID tag is used instead of a ticket and a serial cable is used instead of wifi ESP8266 is used as a data sender is UID to the server computer. And also in this research an application was made for online booking of empty parking slots.

The purpose of writing this final project is to create a vehicle position prediction system in the parking area. The benefit of this research is to provide information to vehicle users to find parking positions easily.

1.2 PROBLEM STATEMENT

Parking lot is an important facility in a shopping center, offices, and others. The extent of the parking area and the number of vehicles in the parking lot are obstacles for car drivers to know or find the location of vehicle parking and empty parking lots. Drivers often run out of time to find the position of the vehicle and find a parking space. Currently the parking information only displays a red light for filled parking spaces and a green light for available parking spaces.

1.3 OBJECTIVE

1. To prevent drivers from scrambling for parking locations.
2. To connect the parking location with the apps.
3. To improve the time efficiency of find the car park location.
4. To inform directly location parking with driver.

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1.4 SCOPE OF PROJECT

This project will be implemented by applying Radio Frequency Identification (RFID) technology to facilitate the search for car parking locations. The use of RFID tags will be more optimal in finding vehicle parking locations. This project only focuses on all the parking lots of shopping complexes, offices and others. The detection range of RFID tags with antennas will be studied.

This project will also study the possibility of using an android application for practical parking bookings in our country by considering time and cost efficiency as well as maintenance of this technology is required after it is implemented.

1.5 SIGNIFICANT OF PROJECT

This project is important because it will create a system that makes it easier for motorists to find the position of the vehicle and where it is parked. Vehicle position search is carried out by providing information in the form of license plates, vehicle color and vehicle position information. The Liquid Cristal Display (LCD) at the entrance to block A and block B will notify motorists whether there are still empty parking spaces. The android application also helps drivers book parking slots practically so that drivers don't have to waste time looking for the desired parking location.

1.6 LIMITATION

The proposed project can quickly detect empty parking spaces. then also being able to manage a large parking lot and the large number of vehicles in the parking area makes it difficult for parking users to find a vehicle and find an empty parking space. The vehicle position prediction system in the parking area provides a solution for motorists to quickly find a vehicle and find an empty parking space. by using an RFID tag instead of a ticket and a serial cable that is used instead of the NodeMCU that is used as a data sender, namely the UID to the server computer. The LDR sensor is used as a notification if there is still an empty parking space and the empty parking space data is displayed on the LCD door block. And the android application must be installed to check the availability of parking slots and to book parking slots. This saves the user time that was previously wasted searching for available parking spaces. This helps make check-in and check-out in the parking lot easier. A certain minimum amount in the smart card must be maintained to gain access to the parking area. Users do not need to stop before checking in or checking out from the parking lot to pay money. Hence, it saves our time.

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CHAPTER 5

RECOMMENDATION AND CONCLUSION

5.1 Conclusion

Smart parking location tracking using RFID and Android applications is a technology that will help and make it easier for motorists to find empty parking locations. The application of this technology has not been widely applied in parking lots, because the installation is impractical. The application of the system in this study uses an RFID card to access the parking control system. An RFID card is a card that contains a microchip that is used to store data. The design of a parking area information system uses a servo motor as an entrance and exit, the Arduino Uno R3 microcontroller is used for door control and data processing. This RFID technology control can identify parking lots automatically by transferring information from the RFID Tag to the RFID Reader making it easier for the driver to find out which parking spaces are still empty. Users can park their vehicles without human intervention. This system also helps users to save time and increase the efficiency of finding available parking spaces. This smart parking system can be implemented in parks, malls, hospitals, etc. This project uses an Android application system that can be accessed easily.

5.2 Recommendation

Suggestions for developing a smart parking location tracker using RFID and Android applications are as follows:

1. The smart parking system in the parking area does not work properly.
2. The coding of the program still has problems.
3. The internet connection is still unstable, because the coding is still connected to the cellphone hotspot internet connection
4. RFID information is not working properly because the Arduino program is still not correct.

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2. Dilarang mengumumkan dan memperbanyak sebagian atau seluruh karya tulis ini dalam bentuk apapun tanpa izin Politeknik Negeri Jakarta

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