**Engineering Professions Department**

**Computer Systems Engineering**

**IOT SMART SYSTEM PARKING**

Prepared by:

1. Abdullah Ayesh 1849011025
2. Amro Alser 1949011008
3. Razan Al-Farra 1949011057
4. Saba Al- Aloul 1849011002

Supervised by:

Dr. Ezzeldeen Edwan

Palestine, Gaza

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**Table of contents**

Generate the table of contents automatically using MSWord. If you specify, in the body of the proposal, the Headings (Heading 1, Heading 2, Heading 3) appropriately Word will generate the table of contents automatically. For example, this table of contents was generated automatically (you have to update it after you finish typing and formatting the proposal).

Example:

Table of Contents

[Abstract 3](#_Toc465844193)

[1. Introduction 3](#_Toc465844194)

[1.1 Problem Statement 3](#_Toc465844195)

[1.2 Objectives 3](#_Toc465844196)

[1.2.1 Main objective 3](#_Toc465844197)

[1.2.2 Specific objectives 3](#_Toc465844198)

[1.3 Importance of the project 4](#_Toc465844199)

[1.4 Scope and limitations of the project 4](#_Toc465844200)

[2. State of the art/review of related works 4](#_Toc465844201)

[3. Methodology 4](#_Toc465844202)

[3.1 Theories and Methods 4](#_Toc465844203)

[3.2 Software Tools and Equipment Requirements 4](#_Toc465844204)

[3.3 Time Table 4](#_Toc465844205)

[5. Bibliography 5](#_Toc465844206)

# Abstract

Describe briefly, usually in one paragraph of 200-300 words your project topic, problem statement, methodology, and the expected outcomes. The Abstract should be written after completing this report.

The major aspects of the entire project in the following prescribed sequence: state the problem statement very clearly in the first or second sentence. Name or briefly describe the basic methodology used without going into excessive details be sure to indicate the key techniques used. Finally, state your expected outcomes.

# Introduction

Searching for parking spaces is a routine matter, and studies indicate that nearly 30% of congestion is due to drivers moving in search of parking spaces, and this is a reason for wasting large amounts of oil and this is not environmentally friendly. This increasing traffic congestion and uncertainty in the availability of parking spaces has led to the need for smart parking systems. Which provides drivers on their trip with a one-stop solution without wasting time searching for parking, cost, travel time, etc. This feature comes by paying a small fee to smart parking service providers.

A smart parking system is an Internet of Things (IoT) solution that helps manage and optimize the use of parking spaces in a given area. It typically consists of sensors that are installed in parking spaces and connected to a central server through a wireless network. The sensors can detect when a space is occupied or available, and the central server can use this information to provide real-time updates on the availability of parking spaces to users. The system provides control of the entry and exit gate of the parking lot, where the entry gate is linked with information about the vehicle number, the time and date of its entry to the parking lot, the driver's data, and others. As for the exit gate, it is designed to open while the driver completes the payment process for the number of hours the car has spent in the parking lot.

## Problem Statement

The traditional car parking system has a lot of disadvantages. The traditional parking systems which are in existence currently right now suffer from major drawback. Here are some of the major issues faced by traditional car parking system now. The traditional car parking system is very dependence on the guards because they are fully manual which requires a guard to open and close when there is vehicle entering or existing the car parking lot. Furthermore, visitors are allowed to enter a premise by the guards on duty without knowing whether the visitors are allowed to go in or not. Long waiting time is also one of the major issues showed by the traditional car parking system. When there is a number of car approaching the car parking entry at the same time, the visitors are forced to wait for a long time to enter the car parking lot due to the traditional parking system. Searching for parking space Is a tedious and time-consuming process. It increases the frustration levels among the drivers as is completely based on trail and error basis. In addition to the above fuel is wasted in this process. For Parking Fees Currently the parking places accepts only cash mode of payment and the availability of coins to pay for exact change is a problem. Another problem faced is that the minimum charged amount which is charged irrespective of considering the time utilized By analysing the above problems, the deployment of Smart parking system is clearly advantageous, as it saves both time and fuel. In addition to the above Online booking system eliminates the problem of carrying exact change and the amount charged is based on time the parking is utilized.

## Objectives

### **Main objective**

This technology is meant to curb the problems underlying with the current parking systems and provide a much more efficient, modern and eco-friendly solution. Park strives to make the parking experience more convenient for the users and also to help increase the revenue of the cities/ parking lots by reducing the costs for labor, So that will help people manage time and make them waste as least time as possible while undergoing the parking operations ; Especially people who are always in a rush due to work or late due to traffic. It’s also quite useful in countries that have huge population.

### **Specific objectives**

The specific objectives of the project are:

* There will be no need of a person for guidance to the vehicle parking lots, its arrangement and surveillance. Customers will come to know themselves about the parking slots.
* The software system automatically detects the vacant or occupied slots and then assigns the vacant slot to the customer at its entrance.
* There is central controlling system to handle and keep tracking on the proper working functionality of the system.
* The customers can easily take entry in the parking lots without having trouble for finding the vacant slots and make exit by having payment receipt.
* This system reduces human efforts and maintains traffic discipline.
* Easy payment system for customers by easy to use technique.
* Automatic charges receipt generation system for admin.
* Can search about nearby parking using GPS.

## Importance of the project

* **Improved user experience**

License plate recognition units facilitate a quicker entrance and exit from the parking facility, especially for employees who work on the premises and customers with reservations. On another note, that parking facility guidance systems enable operators to know exactly how many vehicles are in a facility at any given time is fundamental for high-quality traffic management. Parking sensors can detect whether a space is free or occupied, and guide the user to the closest available space, which facilitates management for drivers.

* **Time and cost savings**

Smart parking technologies can help drivers save time and money. This is because when drivers enter the parking area at a time of heavy vehicle congestion, it may take them several minutes to find a free parking space, leading to time wasted in the search. Not only that, driving for miles in search of a parking space means wasting fuel, and unnecessarily running up costs. Facilitating vehicle traffic toward available spaces will do away with traffic jams and cut down parking space search times to the minimum.

* **Reserving parking spaces**

This eases traffic fluidity at entrances and exits, and improves the user experience to an even greater degree, in addition to being a competitive advantage for the parking operator.

* **Reduce Parking Stress**

The majority of the people avoid going to the congested part of the city as they do not want themselves to get stuck in the parking hassle which creates stress and anxiety among the drivers. Knowing that you will be spending so much time in search of parking but will still end up parking your car in a space far away from the destination is extremely discouraging. Furthermore, driving around the same street again and again and still not finding a space to park a car is frustrating. Smart parking solutions are aimed to make the parking experience of the drivers stress-free. Smart parking applications let the divers know about the available parking space in the area they want to travel to. This reduces the unpredictability and stress associated with finding an appropriate parking space near the desired destination.

## Scope and limitations of the project

Delimit your research project: What you intend to do and do not intend to do?

State the assumptions: Offer a clear statement of all assumptions upon which the project/research will rest.

# State of the art/review of related works

***''RFID BASED PAID PARKING SYSTEM''*** RFID parking system by using ESP8266, Arduino, RFID with cards, and a Raspberry pi. Which RFID Card and Barcode Ticket Car Parking Still working into 1200 m of distance, multifunctional , but it high cost. [1] ***"RASPBERRY PI BASED INTELLIGENT CAR PARKING SYSTEM''*** Intelligent Car Parking System based on Raspberry Pi, IR Sensor, QR Code, and IOT model which automation ,the parking slots have IR sensors with Raspberry Pi Controlling Unit. From detection of IR sensors, car presence or absence , but the sensor required line of sight. [2] ***''AN EFFICIENT CAR PARKING MANAGEMENT SYSTEM USING RASPBERRY-PI''*** An low cost and easy to work car parking system which has the ability of monitoring and handling parking spaces for individuals with the help of android application. The sensing signal from the IR sensor are transmitted via Raspberry pi processor and processed data will be transmitted through Wi-Fi to an Android mobile phone by enabling the new application. [3] ***"LOW COST SMART PARKING SYSTEM FOR SMART CITIES"*** Smart Parking system is an Internet of Things based parking system wherein which drivers can identify vacant parking slots easily with the help of their Smart Phone or a Computer. Smart parking system also accounts for online booking of a parking slot. The main idea behind this concept is computerized allocation of parking slots without any human. this parking based on Raspberry Pi and other low cost component.[4] ***"NFC BASED PARKING SYSTEM FOR SMART CITIES ''*** Parking System for Smart Cities with the latest Near Field Communication (NFC) technology. A requires customers to book the parking slot at their convenience using the website or the android application and authenticating their NFC ID and important role acting as the sole resource for identification of the vehicle and validation of ticket, the user’s phone itself could solely act as the ticket. Further, the unique NFC ID along with a cloud based database, are used to avoid any unauthorized entry into the parking lot as well as to avoid duplication of data. [5]

# Methodology

## Theories and Methods

A collection of theories, concepts or ideas. Rationale and philosophical assumptions that underlie the study. In software development projects, it might also include the method undertaken in the information collection, analysis and design of the system. Any existing method such as software methods, algorithms, approaches that are needed in the project.

## Software Tools and Equipment Requirements

Software tools, packages, APIs, software libraries, special environments, frameworks, etc. that are necessary to carry out the project. List any special equipment, devices, hardware, etc. that are needed for the project.

## Time Table

Gantt chart of the phases of the project and their corresponding estimated time.

1. **Expected Outcome/ Deliverables**

What expected outcomes (final product(s)) will you deliver when finishing this project?

# Bibliography

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6. Smart Parking System Based on Internet of Things Getzi Jeba Leelipushpam Paulraj1 , Immanuel Johnraja Jebadurai2 , Pathan Firoz Khan3 , Neela Sumanth4 , Kothapally Vishal Reddy5 Department of Computer Science and Engineering Karunya Institute of Technology and Sciences Coimbatore, India getzi@karunya.edu1 ,immanueljohnraja@gmail.com2 , pathanfiroz@karunya.edu.in3 ,neelasumanth@karunya.edu.in4 ,kothapallyvishal@karunya.edu.in5
7. An Automated Payment System for Car Parks Based on Near Field Communication Technology Giuliano Benelli, Alessandro Pozzebon University of Siena, Italy be nelli, alessandro.pozzebon [{@unisi.it}](mailto:%7b@unisi.it%7d).