|  |  |  |  |
| --- | --- | --- | --- |
| PROJECT REQUIREMENTS SPECIFICATION  SMART PARKING SYSTEM  UE18CS390A – Capstone Project Phase – 1  ***Submitted by:***   |  |  | | --- | --- | | **Pallavi A N**  **R S Chaitra sree**  **Abhishek D**  **Yukthi G L** | **PES1201801979**  **PES1201801628**  **PES1201802109**  **PES1201802033** |   Under the guidance of   |  | | --- | | **Prof. Sunitha R**  Professor  PES University |   **January-May 2021**  **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**  FACULTY OF ENGINEERING  **PES UNIVERSITY**  (Established under Karnataka Act No. 16 of 2013)  100ft Ring Road, Bengaluru – 560 085, Karnataka, India |

TABLE OF CONTENTS

|  |  |
| --- | --- |
| 1. Introduction | 3 |
| 1.1 Project Scope | 3 |
| 1. Product Perspective | 3 |
| 2.1 Product Features | 3 |
| 2.2 Operating Environment | 4 |
| 2.3 General Constraints, Assumptions and Dependencies | 4 |
| 2.4 Risks | 4 |
| 1. Functional Requirements | 4 |
| 1. External Interface Requirements | 5 |
| 4.1 User Interfaces | 5 |
| 4.2 Hardware Requirements | 5 |
| 4.3 Software Requirements | 5 |
| 4.4 Communication Interfaces | 5 |
| 1. Non-Functional Requirements | 6 |
| 5.1 Performance Requirements | 6 |
| 5.2 Safety Requirements | 6 |
| Appendix A: Definitions, Acronyms and Abbreviations | 6 |
| Appendix B: References | 6 |

# Introduction

# In our day-to-day life we would have come across many problems during our travel. As we are familiar this problems are caused due to traffic and one of the reason behind this traffic would be parking space. We spend a lot of time and fuel in searching a parking space, and also as we drive we tend to slow down our vehicles whenever we find a free parking slot this may lead to accidents. In order to solve this problems we need a proper smart parking management system where it can lead the drivers to their appropriate parking slots (or) gives an idea about free parking slot nearby.

# In this document we would be sharing an idea about how we can implement a smart parking system inside campus, hospitals, malls etc. This document would contain all the details about the product, product functionality product features and how does it work in real world. Final product would be a working model.

# Project Scope

# Our main objective is to make parking more efficient and less time consuming. In our system we would be restricting our parking solution to indoor parking such as hospitals, malls, campus etc. We come around few benefits of our projects such as enhanced user experience, saves user time, less fuel wastage and much more. We also have few limitations of our system this system requires regular maintenance, there might be breakdown in system, cost of construction would be high.

# Product Perspective

# Product Features

The main feature about this product is that it indicates the presence of car and updates the number of available slots in LCD. It has IR Sensor which helps in detecting the presence of car feature. The number of available slots is updated based on the LED lights when the car gets parked The LED starts glowing indicating the car is parked in case of car parked the Number of available slots reducing if case of free it increases.

# Operating Environment

* OS-windows/mac OS/Linux with Arduino IDE installed and supported.
* Sensors would run with continuous power supply.

# General Constraints, Assumptions and Dependencies

* The system in which the model is developed should have Arduino IDE installed.
* We assume there would continuous power supply.
* The system won’t work if there is no power supply.

# Risks

* There can be breakdown of sensors.
* Misusage of the system (some object kept on sensor instead of vehicle).
* As there would continuous power supply there will be chances of short-circuit

# Functional Requirements

# REQ\_1: Uninterrupted power supply.

# REQ\_2: Sensors should be placed in safe place so that there will be no breakdown of sensors.

# REQ\_3: Immediate update in LCD when car leaves or gets parked.

# REQ\_4: Proper functionality of sensors

# External Interface Requirements

# User Interfaces

# As it is a hardware implementation the user interface will just be the LCD display which displays the number of available slots.

# Hardware Requirements

* Arduino UNO
* IR sensor
* LCD
* Jumper wires
* LED

# Software Requirements

* Arduino UNO
* SQL database

# Communication Interfaces

The communication interface is local area network through Ethernet.

# Non-Functional Requirements

# Performance Requirement

# We will try to get a min of 80% accuracy

# Sensors give long durability

# Safety Requirements

# Sensors are not broken

# There is no short-circuit during constant power supply

# Appendix A: Definitions, Acronyms and Abbreviations

|  |  |
| --- | --- |
| IOT | Internet of things |
| LED | Light emitting Diode |
| LCD | Liquid Crystal display |
| IR | Infra red |
| OS | Operating system |
| Arduino IDE | Software for arduino programming |

# Appendix B: References

* <https://www.researchgate.net/project/Teleoperated-Robot-Programming-and-Trajectory-Planning-Using-Augmented-Reality-in-Hazardous-Environments>
* <https://stackoverflow.com/questions/14494747/how-to-add-images-to-readme-md-on-github>
* <https://ieeexplore.ieee.org/abstract/document/8907944>
* <https://www.researchgate.net/publication/337682025_Smart_Car_Parking_Management_System>