Software Requirements Specification

for

AUTOMATIC NUMBER PLATE RECOGNITION AND PARKING OCCUPANCY PREDICTION

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1. Introduction

1.1 Purpose

This document aims to present a detailed description of the Web Application – Automatic Number Plate Recognition and Parking Prediction. It will explain the purpose and features of the application and the constraints under which it works. The purpose of this SRS document is to provide a detailed overview of our software product, its parameters, and goals. This document describes the project's target audience and its user interface, and hardware and software requirements.

1.2 Document Conventions

Headings	Times New Roman, Bold	17
Sub Headings	Times New Roman, Bold	16
Normal Text	Times New Roman	12

1.3 Intended Audience and Reading Suggestions

This SRS is intended for the following audiences:

- The team members including project guide, coder, developer, documentation writers
- Professors of the college

1.4 Product Scope

The project is a web application-based work that acknowledge staff of the college about the parking occupancy inside the campus. Also, this will recognize the vehicle entering the campus through number plate reading.

As the staff opens the web page, the trained model will predict the parking occupancy rate of requested time and day. And the admin of the web page (security staff) can view all details of the vehicle inside the campus.

1.5 References

Websites:

- https://www.capitalone.com/tech/machine-learning/understanding-arima-models
- https://www.sciencedirect.com/search?pub=Sustainable%20Parking%20Management&cid=321373
- https://stackoverflow.com
- https://www.youtube.com/watch?v=yqkISICHH-U

2. Overall Description

2.1 Product Perspective

The ANPR and Parking prediction is a web application. After opening the application, the staff can view the availability of parking slots at any time. On requesting a day and time the predicted availability of parking slots will be displayed. The sign-up option is provided for only admin. If the admin is logged in, it will be redirected to the admin web page where the admin can view the details of vehicle inside the campus at that instance. Based on that the security staff can find out the visitor vehicle that are parked after exceeding the time permitted for each one.

2.2 Product Functions

The product functions of this application are: -

- Admin login.
- Predict the parking availability inside the campus.
- Recognize the vehicle entering the college.
- Can distinguish between staff and visitor vehicle entering the campus.

2.3 User Classes and Characteristics

- The users of this application include staff of the college and security staff.
- The security staff are required to login to application to view the vehicle details.
- The users can check for the availability of parking slots in the campus through the web page for any date and time.

2.4 Operating Environment

The application will be operating on windows environment. ANPR and Parking Prediction is a web-based application which is compatible with commonly used browsers like Google Chrome, Mozilla Firefox, Microsoft Edge etc. The only requirement of this online web application is requirement of secure internet connection.

2.5 Design and Implementation Constraints

- The application is built in such a way all vehicle's number plate are recognised.
- A region of interest is extracted from the captured images of the vehicles.
- Accuracy can decrease if the camera pixel quality is low.

2.6 Assumptions and Dependencies

Assumptions are:

- User-friendly system
- Error free code
- Faster computations

Dependencies:

- The specific hardware and software in which the application runs.
- High camera quality

3. External Interface Requirement

3.1 User Interfaces

ANPR and parking prediction is a web application where users or the staff can view the future parking occupancy and congestion inside the campus on the requested time and date. The user web page prompt with an input box for the entry of date and time from the user. As the staff enter the data, it redirects to the webpage that predicts the parking occupancy of that instant mentioned. Also, it shows the recommended time for the suitable day by performing some operations.

FRONT END LANGUAGE: HTML, CSS and JavaScript

BACK-END SCRIPTING LANGUAGE: Python

3.2 Hardware Interfaces

- Windows 7 or above
- Browser that supports HTML & JavaScript (Latest Versions of Google Chrome Preferred)

3.3 Software Interfaces

Following are the software used for the implementation of AI Fitness Guide.

SOFTWARE USED	DESCRIPTION
Operating System	We have chosen Windows operating system for its best support and user-friendliness.
Database	Firebase is used to store information.

3.4 Communication Interfaces

This project supports all types of web browsers. Simple forms are used to input picture and other details.

4. System Features

4.1 System Feature I

This application can predict the parking availability inside the campus.

4.2 System Feature II

This application can recognize the vehicle entering the campus and distinguish between staff and visitor.

5 Other Non-functional Requirements

5.1 Performance Requirements

The application manages facilities required by the casual users quickly and easily. It offers to take enquiries faster through online. It needs a high-quality camera and a higher-end system.

5.2 Safety Requirements

In case the customer forgets or loses Password, the repair functionality helps

- Choosing “forgot password” option in the main login window.
- To avoid any data loss backups can be taken.
- While typing the password, if the caps lock is on it must be notified.

5.3 Security Requirements

This web application is provided with authentication without which admin can pass. So only the admin is allowed to view the details of vehicles.

5.4 Software Quality Attributes

Reliability: Good validations of number plate can recognize.
Maintainability: During the maintenance stage, SRS document can be referred for any validations.
Portability: This system can be easily viewed in any browser.
Security: Security of the system is maintained by giving access to only authenticated admin id and password.

6. Other Requirements

Appendix A: Glossary

DB: Data Base
ANPR: Automatic Number Plate Recognition

Appendix B: Analysis Models

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