**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

AI Fitness Guide is a web application where users can upload their full-frame photograph to the site and see their BMI. The site opens to a home page from where it is navigated to the login or signup page upon taping the “CHECK BMI” button. The signup page collects the mail id, date of birth, password, and phone number to signup while the user can log in with the mail id and password to the “Check BMI” page. Only people above the age of 18 can register. Else show validation error. Once the user is authenticated, he/she is navigated to the Check BMI page where the user is provided a form to upload the full-frame photograph which is supposed to be in 172x172 png format followed by a button “CALCULATE BMI”. If the image size is exceeded show an error.

After processing the image, the system displays the BMI of the person and categorizes him/her according to the BMI chart as Underweight, Normal Weight, Overweight or Obese. It also shows the diet and workout suggestions, and fitness prescriptions if any. The user has the option to log out and once logged out he/she is directed to the home screen. The home screen has other quick links to Log in, Signup, and About Us pages. About Us page shows the description of the project developer team and their contact.

FRONT END LANGUAGE : HTML 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 takes the full frame image from user and generates the BMI from the image.

### 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

**ER DIAGRAM**

