Software Requirements Specification

1. Introduction

1.1 Purpose

The purpose of this document is to provide a comprehensive description of the software requirements for the development of an Automatic Number Plate Recognition (ANPR) system. This document will outline the functionalities, constraints, and specifications necessary to design and implement a robust ANPR system.

1.2 Scope

The ANPR system aims to automatically recognize and interpret licence plate information from images and video streams. It will be utilised for various applications, including law enforcement, parking management, and traffic monitoring.

1.3 Intended Audience and Reading Suggestions

This document is intended for developers, project managers, testers, and documentation writers. It provides an overview of the ANPR system's requirements, organised to cater to each reader type.

2. System Overview

2.1 System Description

The ANPR system will capture images or video frames containing vehicle licence plates, process the visual data, and extract relevant information such as licence plate number, date, time, and location.

2.2 Key Features

Licence Plate Recognition: Accurate extraction and recognition of licence plate numbers.
Date and Time Stamping: Associating recognized licence plates with the date and time of capture.
Location Tagging: Geotagging captured data with the location of the vehicle.
Database Integration: Storing and retrieving recognized licence plate information from a database.
Alerts and Notifications: Generating alerts or notifications for specific events or matches.

3. Functional Requirements

3.1 Image/Video Input

- The system should accept images or video streams containing vehicles with visible licence plates.
- Images may be captured by surveillance cameras, CCTV systems, or other image sources.

3.2 License Plate Recognition

- Implement an algorithm for accurate licence plate recognition.
- Recognize alphanumeric characters from various plate formats.

3.3 Date and Time Stamping

- Associate each recognized licence plate with the date and time of capture.

3.4 Location Tagging

- Utilise GPS or other location services to geotag captured data with the vehicle's location.

3.5 Database Integration

- Create and maintain a database to store recognized licence plate information.
- Enable efficient retrieval of information based on queries.

3.6 Alerts and Notifications

- Implement a notification system for specific events, such as unrecognised plates or matches against a watchlist.

4. Non-functional Requirements

4.1 Performance

- The system should process images in real-time, with minimal latency.
- Support recognition in various lighting and weather conditions.

4.2 Reliability

- Ensure a high level of accuracy in licence plate recognition.
- Implement error-handling mechanisms for exceptional cases.

4.3 Security

- Implement encryption for stored licence plate data.
- Ensure secure communication between system components.

4.4 Usability

- Provide a user-friendly interface for system configuration and monitoring.
- Support integration with existing surveillance systems.

4.5 Scalability

- Design the system to handle a scalable number of cameras and concurrent recognitions.

5. System Architecture

5.1 Component Diagram

- Provide a high-level overview of the system architecture, including components such as image capture, recognition engine, database, and user interface.

6. Interfaces

6.1 User Interface

- Design an intuitive web-based or desktop interface for system configuration and monitoring.

6.2 API

- Define an API for integration with third-party applications or services.

7. Constraints

- The system's accuracy may be affected by factors such as image quality, lighting conditions, and plate variations.
- Legal and privacy considerations must be taken into account when implementing the system