**SOFTWARE ENGINEERING**

Prepare SRS document for your project.

**1. Introduction**

**1.1 Purpose**

The purpose of this document is to define the requirements for the development of a Helmet Detection, Tripling Detection, and Signal Break Detection system using YOLOv5, as well as a website that allows users to upload CCTV footage videos for analysis. The system will provide analysis of videos to determine the number of people without helmets, the number of vehicles with tripling passengers, and the number of vehicles breaking signals. Users will have different options for uploading videos based on accuracy, login status, and subscription level.

**1.2 Scope**

This system will encompass the following components:

* A YOLOv5-based model for detecting helmets, tripling passengers, and signal violations in CCTV footage.
* A website that facilitates video uploads, analysis, and user interactions.
* Different user access levels based on login and subscription status.
* Access to datasets and newsletters for premium subscribers.
* A chatbot for user interaction.
* Blogs related to road safety and rules.

**1.3 Document Conventions**

**User:** Refers to any person accessing the website.

**Admin:** Refers to users with administrative privileges.

**Premium Subscriber:** Refers to users with a paid subscription.

**Free User:** Refers to users who use the service without a paid subscription.

**SRS:** Software Requirements Specification.

**2. System Overview**

**2.1 Functional Overview**

The system will consist of the following major functions:

* Helmet Detection
* Tripling Detection
* Signal Break Detection
* Video Upload and Analysis
* User Authentication
* Subscription Management
* Access to Datasets
* Newsletter Subscription
* Blog Access
* Chatbot Interaction

**2.2 Non-Functional Overview**

The system will be designed with the following non-functional characteristics in mind:

* **Accuracy:** The detection models should provide accurate results.
* **Security:** User data and videos must be secure.
* **Usability:** The website should be user-friendly.
* **Performance:** Efficient video processing for timely analysis.
* **Scalability:** Ability to handle a growing user base.
* **Reliability:** The system should be available with minimal downtime.
* **Data Privacy:** Compliance with data privacy regulations.

**3. Specific Requirements**

**3.1 Helmet Detection, Tripling Detection, and Signal Break Detection**

The system shall implement YOLOv5-based models for the detection of the following objects in uploaded videos:

* Helmets on individuals
* Vehicles with tripling passengers
* Vehicles breaking traffic signals

**3.2 Website**

**3.2.1 User Video Upload**

Users can upload videos in the following categories:

* 30-second video without login and for free (low accuracy).
* 2-minute video with login and for free (moderate accuracy).
* 5-minute video with login and a premium subscription of Rs. 100/month (high accuracy).

**3.2.2 User Authentication**

Users can register and log in to the website.

Premium subscribers will have additional features and privileges.

**3.2.3 Subscription Management**

Users can subscribe to the premium service for Rs. 100/month.

Premium subscribers can access datasets and newsletters.

**3.2.4 Access to Datasets**

Premium subscribers can access road safety datasets.

**3.2.5 Newsletter Subscription**

Users can subscribe to newsletters.

**3.2.6 Blog Access**

Users can access blogs related to road safety and rules.

**3.2.7 Chatbot Interaction**

A chatbot will be available for user interactions and assistance.

**3.3 Other Requirements**

**3.3.1 Security**

User data, videos, and payment information must be securely stored and protected.

**3.3.2 Compliance**

The system should comply with relevant data protection and privacy regulations.

**4. Use Cases**

**4.1 Use Case 1: Upload Video for Analysis (Free User)**

**Actor:** Free User

**Preconditions:** User is not logged in.

**Main Flow:**

* User selects a 30-second video for upload.
* User initiates the upload.
* The system analyzes the video with low accuracy.
* Results are displayed to the user.

**Postconditions:** Analysis results are displayed.

**4.2 Use Case 2: Upload Video for Analysis (Free User)**

**Actor:** Free User with login

**Preconditions:** User is logged in with a free plan.

**Main Flow:**

* User selects a 2-minute video for upload.
* User initiates the upload.
* The system analyzes the video with improved accuracy.
* Results are displayed to the user.

**Postconditions:** Analysis results are displayed.

**4.3 Use Case 3: Access Datasets (Premium Subscriber)**

**Actor:** Premium Subscriber

**Preconditions:** User is logged in with a premium subscription.

**Main Flow:**

* User selects 5-minute video for upload
* User initiates the upload
* The system analyzes the video with high accuracy
* Results are displayed to user
* User accesses the datasets section.
* The user can download relevant datasets.

**Postconditions:** User has access to datasets.

**5. Conclusion**

This Software Requirements Specification (SRS) document outlines the functional and non-functional requirements for the development of a Helmet Detection, Tripling Detection, and Signal Break Detection system using YOLOv5, along with a website for video uploads, analysis, and user interaction. It also details different user access levels, subscription options, and additional features such as access to datasets, newsletters, blogs, and a chatbot.