Software Requirements Specification (SRS) for Fire Detection System

1. Introduction

1.1 Purpose

The purpose of this document is to provide a comprehensive overview of the requirements for the Fire Detection System, which utilizes the YOLOv8 algorithm for computer vision and is integrated into a web application developed with Flask.

1.2 Scope

The Fire Detection System aims to detect the presence of fire in images or videos using the YOLOv8 algorithm. Additionally, a web application built with Flask will be developed to provide a user interface for interacting with the system.

1.3 Document Conventions

- SRS Version: 1.0
- Date: [Date]

2. System Overview

2.1 System Description

The system consists of two main components:

> YOLOv8 Fire Detection Module: This module utilizes the YOLOv8 algorithm for object detection, specifically focusing on detecting fires in images or videos. Flask Web Application: A web-based user interface that allows users to interact with the YOLOv8 Fire Detection Module. Users can upload images or videos, and the system will perform fire detection.

3. Functional Requirements

3.1 YOLOv8 Fire Detection Module

3.1.1 Object Detection

The system shall be capable of detecting fires in images or videos using the YOLOv8 algorithm.

3.1.2 Confidence Threshold

Users shall have the option to set a confidence threshold for fire detection, and the system shall filter out detections below this threshold.

3.2 Flask Web Application

3.2.1 User Authentication

The web application shall provide user authentication to ensure secure access to the system.

3.2.2 Image/Video Upload

Users shall be able to upload images or videos through the web interface.

3.2.3 Fire Detection Results

The web application shall display the results of fire detection, including bounding boxes around detected fires and confidence scores.

3.2.4 Download Results

Users shall have the option to download the processed images or videos with annotated fire detection results.

4. Non-functional Requirements

4.1 Performance

The system shall be capable of processing images or videos with a reasonable response time, even under heavy load.

4.2 Security

User authentication and data transmission shall be secured to prevent unauthorized access and data breaches.

4.3 Usability

The web application shall have an intuitive and user-friendly interface for easy interaction.

5. System Constraints

5.1 Hardware

The system requires hardware with sufficient computational power to run the YOLOv8 algorithm efficiently.

5.2 Browser Compatibility

The web application shall be compatible with major web browsers, including Chrome, Firefox, and Safari.

6. Conclusion

This Software Requirements Specification provides a detailed outline of the requirements for the Fire Detection System, incorporating the YOLOv8 algorithm and a Flask web application. It serves as a foundation for the development and testing phases of the project.