AI-Based Intelligent Video Analytics for Prayagraj Smart City Project

Introduction

The Prayagraj Smart City project aims to transform the city of Prayagraj into a technologically advanced and efficient urban center. As part of this initiative, the implementation of AI-Based Intelligent Video Analytics has been undertaken to enhance various aspects of the city's operations, including infrastructure management, public safety, and traffic control. This case study provides an overview of the project, its purpose, scope, and the benefits it offers.

Purpose and Intended Audience

The purpose of this case study is to document the software requirements and functionalities of the AI-Based Intelligent Video Analytics solution deployed in Prayagraj. It is intended for developers, project managers, testers, documentation writers, operators, supervisors, administrators, and other stakeholders involved in the project. This document outlines the product scope, overall description, operational environment, constraints, and serves as a reference for clients to ensure compliance with requirements and specifications.

Scope and Benefits

The scope of the AI-Based Intelligent Video Analytics solution encompasses the analysis of video feeds using advanced algorithms and artificial intelligence techniques. The system extracts critical events and metadata from surveillance footage, enabling efficient city operations and data-driven decision-making. The benefits of the solution include enhanced public safety, improved situational awareness, efficient traffic management, and the ability to detect and address issues such as vandalism, waste management, and citizen safety in real-time.

2. Use Cases

The AI-Based Intelligent Video Analytics solution in Prayagraj Smart City project covers various use cases across different locations in the city. Here are some examples:

2.1 Solid Waste Management/Vandalism

- Graffiti detection
- Vandalism detection
- Debris and garbage detection

2.2 Traffic Management

- Parking violation detection
- Speeding vehicle detection
- Wrong-way or illegal turn detection

2.3 Citizens Safety

- Loitering detection
- Person/face recognition
- Crowd counting

3. Product Overview

The AI-based analytics platform utilized in Prayagraj Smart City project incorporates video, sound, and data analytics. It employs artificial intelligence techniques to analyze video content in real-time, extract valuable metadata, generate alerts, and provide actionable intelligence to security personnel and other systems. The solution is scalable and easily customizable, allowing integration with third-party applications such as Command Control Systems. Key features include fast setup and continuous updates, flexible APIs for seamless integration, a powerful dashboard for data analytics, and custom analytics capabilities.

4. Product Perspective

The AI-Based Intelligent Video Analytics solution in Prayagraj Smart City project offers several key highlights and advantages:

• 5G Ready Solution: Supports the transformation of regular IP cameras into 5G-enabled cameras.

• Mobile Compatibility: Analytics can be mounted on mobile devices, providing accurate outputs on the go.

• Deep Learning and Continuous Learning: Utilizes AI algorithms and continuous learning techniques to improve accuracy over time.

• Data Center Deployment: Highly flexible deployment in data centers without compromising output accuracy.

• Optimized Algorithm: Optimized algorithms reduce hardware footprint, minimizing infrastructure usage.

• Integration and Storage: Generates RTSP analyzed output for embedding in Video Management Systems (VMS) and storage.

• Agile and Closed-Loop Solution: Allows for improved accuracy and the development of new use cases based on city-specific video data, with a shorter turnaround time.

• Cloud-Native Architecture: Built on a micro-services architecture, leveraging cloud-native technologies.

• Continuous Integration and Deployment: Follows the Continuous Integration and Continuous Deployment model with DevOps automation.

• High-Density Environment Capability: Robust performance in crowded indoor and outdoor environments.

• Tested and Proven: The solution has undergone thorough testing, deployment, and operation with ecosystem partners and leading Continuous Learning setups, minimizing project uncertainties.

• Versatile in Challenging Conditions: Designed to handle various indoor and outdoor conditions effectively.

By leveraging the AI-Based Intelligent Video Analytics solution, the Prayagraj Smart City project has been able to enhance surveillance capabilities, improve public safety, streamline traffic management, and enable data-driven decision-making. The successful implementation of this technology sets an example for other smart city initiatives, demonstrating the potential for transformative outcomes through the integration of advanced analytics and artificial intelligence.