AI-Powered Smart Ambulance Traffic Management System

Enhancing the efficiency of emergency response through innovative AI technology and smart traffic solutions to save lives and improve outcomes.

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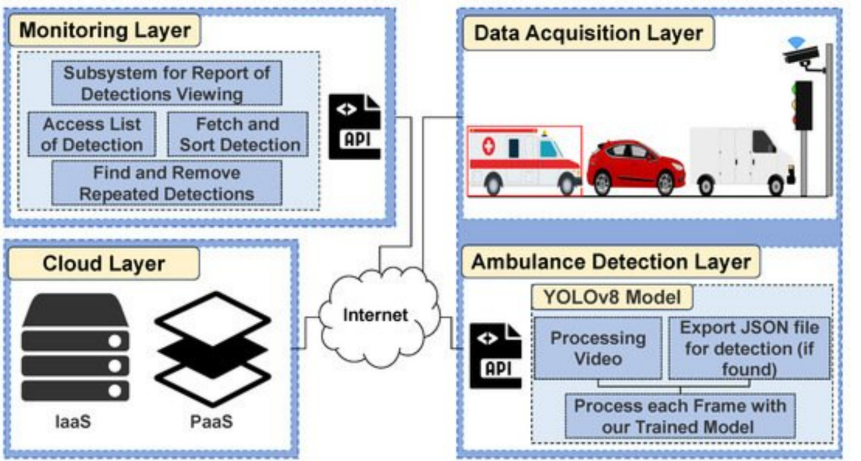
Dilip

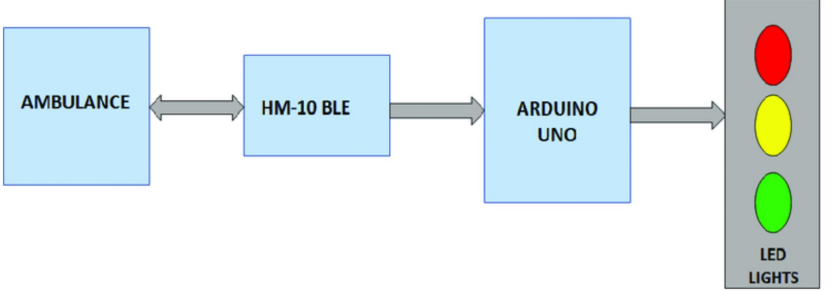
Presenter

TRAFFIC MANAGEMENT

Introduction to Smart Ambulance Traffic Management



Traffic congestion can delay ambulances and endanger lives. Our AI-powered system detects traffic issues and prioritizes emergency vehicles in real-time.



Traffic Signal Management Using AI and IoT

Understanding the Integration of AI and IoT in Traffic Signals

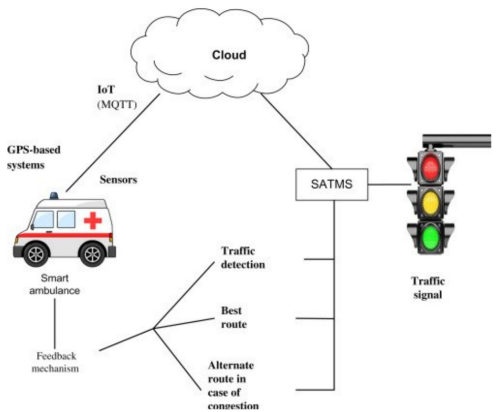
- **AI-Powered CCTV Detection**
  Machine learning algorithms in CCTV detect ambulances in real-time for timely response.
- **IoT-Based Communication**
  Ambulances send real-time location and status data to traffic signals via IoT modules.
- **Automatic Signal Switching**
  Traffic lights turn green for ambulances when detected, ensuring smooth passage.
- **Multi-Ambulance Coordination**
  System prioritizes multiple approaching ambulances based on arrival time and patient condition.

Patient Risk Assessment Overview

Key Vital Signs and Their Risk Indicators

Vital Sign	Sensor Used	Critical Condition (High Risk)
Heart Rate (BPM)	ECG Sensor (AD8232)	<50 or >150 BPM
Blood Oxygen (SpO2)	Pulse Oximeter (MAX30102)	<85%
Blood Pressure (BP)	BP Sensor (MPX5050GP)	<90/60 or >180/120
Body Temperature	Temperature Sensor (MLX90614)	>39°C (Fever)
Respiratory Rate	Piezo Sensor/Capacitive Sensor	<10 or >40 breaths/min

System Response to Critical Patients



- **Real-Time Condition Analysis**

  Vital signs are continuously monitored to identify critical conditions and assign a 'High Priority' status.

- **Traffic Light Priority System**

  Ambulances carrying high-risk patients are given traffic priority at intersections to ensure swift transport.

- **Hospital Notification System**

  Immediate updates about patient conditions are sent to hospitals for emergency preparedness.

- **Police Intervention Alert**

  When necessary, traffic police are alerted to clear pathways for ambulances transporting critical patients.

Multi-Ambulance Conflict Resolution

Rules for Managing Multi-Ambulance Scenarios

- **Nearest Ambulance Goes First**

  The ambulance closest to the intersection receives the first green light, ensuring prompt response.

- **Higher Priority Patients Get Priority**

  Ambulances with more critical patients are given preference in the signal sequence.

- **Traffic Signal Timing Adjustments**

  Green signal duration is extended to allow safe passage for multiple ambulances.

- **Alternate Route Suggestions**

  Feasible alternate routes are suggested using Google Maps API to optimize response times.

- **Police Notification**

  If conflicts persist, alerts are sent to traffic control for manual intervention.