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B M S INSTITUTE OF TECHNOLOGY & MANAGEMENT BENGALURU-64

IEEE COMPUTATIONAL INTELLIGENCE SOCIETY, BMSIT&M

Project Title : SafeVision, AI-Powered Intelligent Surveillance for Assault Prevention

Theme : Urban Safety and Security

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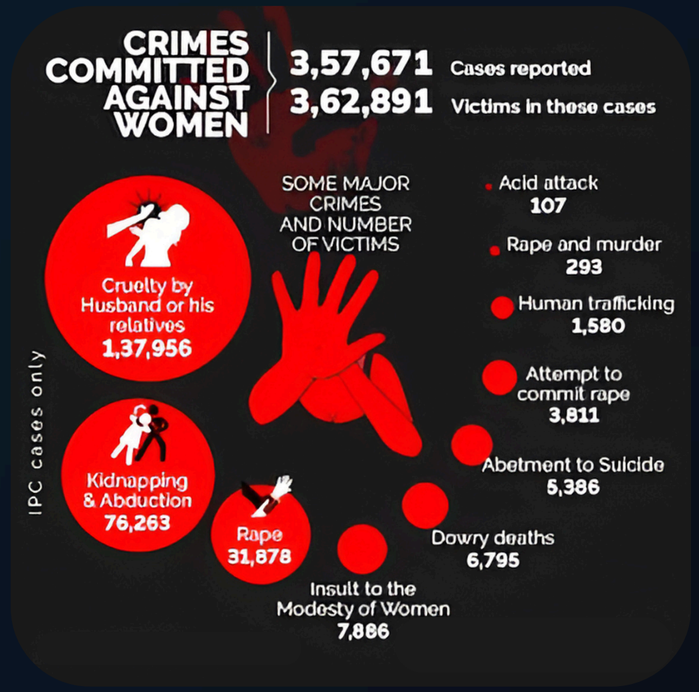
01. Problem Statement

Definition :
Sexual assaults in public spaces remain a serious issue in India, despite widespread surveillance. Traditional CCTV systems only record incidents but do not actively detect or prevent them in real time, highlighting the need for an AI-powered solution that can identify threats and alert authorities instantly.

- Sexual assault remains a major global issue, often occurring in public spaces.
- Surveillance cameras exist, but they lack real-time intervention capabilities.



Source : NCRB 2021

- Victims are unable to seek help and alert authorities, and law enforcement response is often delayed.
- Need for a proactive AI system that can detect threats and alert authorities instantly.

02. Proposed Solution

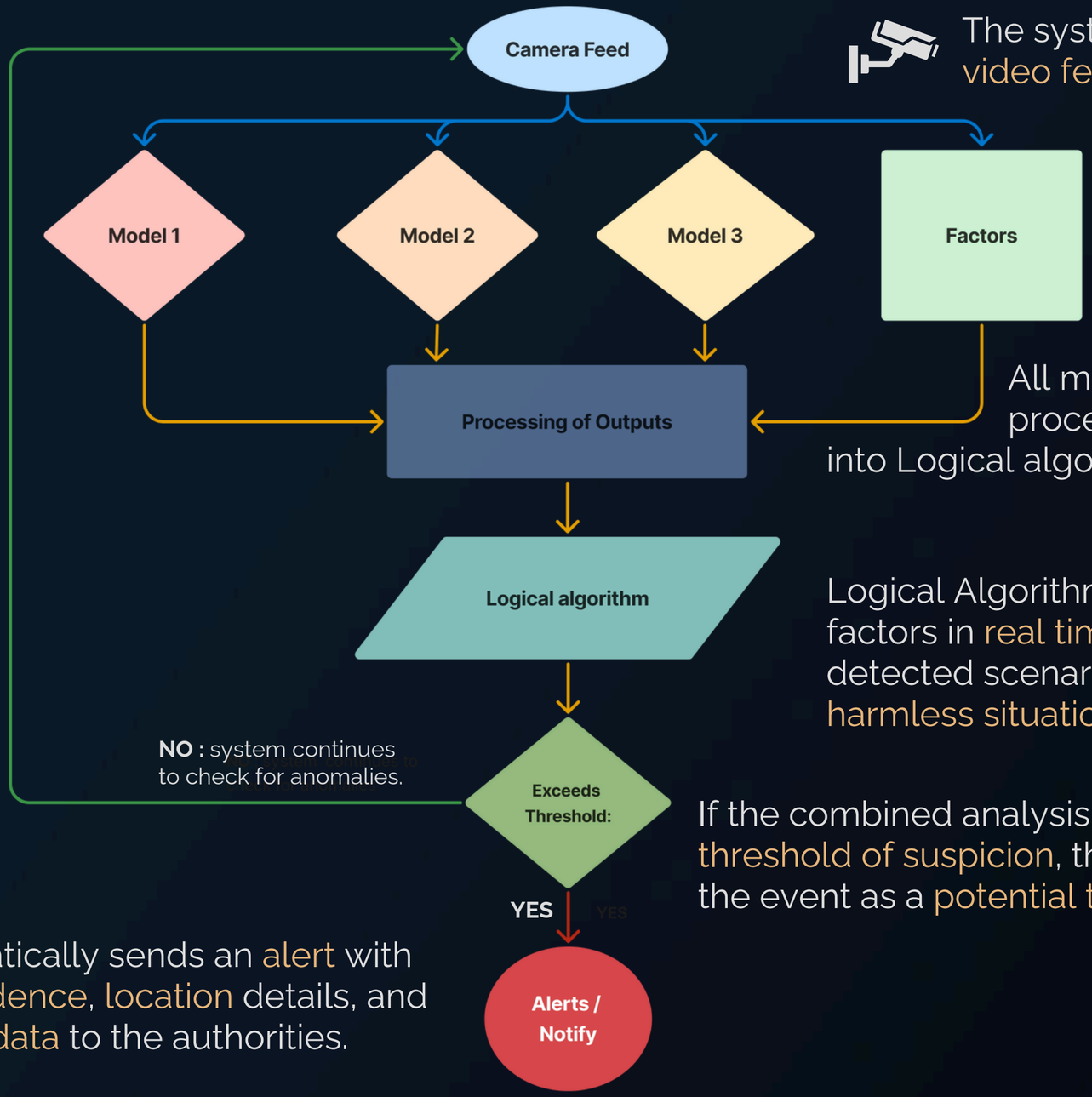
Our Solution : AI-Powered Surveillance for Real-Time Assual Prevention

Traditional CCTV systems only record footage and rely on manual monitoring, leading to delayed responses. Our AI-driven system enhances public safety by analyzing real-time video feeds to detect:

- Aggression vs Affection – Identifies hostile or suspicious interactions.
- Body Language & Facial Expressions – Evaluates distress or potential threats.
- Number of People Involved – Differentiates between lone attackers and group assaults.
- Time & Location Context – Considers whether it's day or night for risk assessment.

Outcome: When a potential threat is detected, the system calculates threat probability and automatically alerts law enforcement for rapid intervention.

How our solution works ?



The system begins by capturing live video feeds from security cameras.

The footage is then processed using advanced AI models ,

Model 1 : Detection of Aggression vs. Affection.

Model 2 : Detection of Distressed Body Language.

Model 3 : Detection of Surrounding People's Behavior.

Factors : Assess external factors such as time, day or night and location to enhance contextual awareness and risk assessment.

All model outputs and factors are processed and structured to be fed into Logical algorithm to assess risk accurately.

Logical Algorithm operates on all outputs and factors in real time and evaluates whether the detected scenario is a potential crime or a harmless situation.

If the combined analysis crosses a predefined threshold of suspicion, the system categorizes the event as a potential threat.

The system automatically sends an alert with real-time video evidence, location details, and threat assessment data to the authorities.

03. Innovation

What makes our idea unique ?

Feature	Traditional Surveillance	**Our AI Enchanced Surveillance**
Threat Detection	Passive (only records)	Active (real-time detection)
Response Time	Delayed (manual review required)	Immediate (automated alerts)
Detection Capability	Limited to human monitoring	Analyzes aggression, body language, and crowd behavior
Preventive Action	No prevention, only post-incident review	Can identify threats early and trigger alarms
Resource Requirement	High manpower needed	Reduces dependency on human surveillance

04. Technical Feasibility

Technologies and Tools proposed

AI Models used

Body Language : PoseFormer, TokenPose

Facial Expression : Swin Transformer

Environment Analysis: ActionFormer

AI Surveillance System

Backend

Backend Framework : Flask

Computer Vision Processing : OpenCV

GUI & User Interface

Web Framework: Flask

Deployment

Docker (Local System)

Alert System

Telegram API

05. Target Audience

Law Enforcement Agents

Enables real-time threat detection and alerts for faster response which also reduces the reliance on manual monitoring.

Public Transport Authorities

Enhances passenger safety in metro stations, bus stops, and railway platforms.

Educational Institutes

Ensures the safety of students and faculty and AI-driven monitoring can identify suspicious behavior near campuses.

Corporate Offices & Workplaces

Strengthens workplace security, especially in night shifts. AI alerts can help prevent harassment in professional settings.

Shopping Malls & Public Spaces

Provides enhanced security in high-footfall areas and assists security personnel in detecting aggressive behavior.

Government & Policy Makers

Supports initiative for safer cities. Can be integrated into mart city projects for better urban security.

06. Impact

- **Crime Prevention:** Enables early threat detection, reducing incidents of harassment and assault.
- **Faster Response:** Real-time alerts ensure quick action by law enforcement.
- **Public Safety:** Creates a safer environment in public spaces, boosting confidence among citizens.
- **Data-Driven Insights:** Helps authorities understand crime patterns and improve security measures.

07. Scalability

- Flexible Deployment: Can be integrated with existing CCTV infrastructure, minimizing costs.
- AI Adaptability: Continuously improves through machine learning, enhancing accuracy over time.
- Wide Applications: Scalable for use in transport hubs, educational institutions, workplaces, and public places.
- Cloud & Edge Compatibility: Can run on both cloud-based systems and edge devices for real-time processing.