Rakshak – Real-Time Weapon Detection System

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Project Ideas

Rakshak, meaning protector or guardian in Hindi and Sanskrit, reflects our mission to enhance safety in public spaces. Our team aims to develop an innovative real-time weapon detection surveillance system by providing real-time weapon detection in surveillance footage, enables instant alerts for potential threats, helping authorities respond quickly and mitigate risks in critical environments.

AI-Powered Detection

Our model has been trained with a dataset of various weapons. The dataset has around 6000 images including pistols, rifles and knives. We trained the detection model using YOLOv11, achieving high performance in identifying weapons with high accuracy. This enables immediate alert generation upon detection.

Result

Rakshak is a surveillance system that deployed as a web application, allowing users to monitor CCTV feeds via a browser. An alert is triggered instantly upon threat detection. With role-based access control, administrators can manage CCTV feeds and other users within their institution. These functionalities make Rakshak a powerful tool for maintaining security.

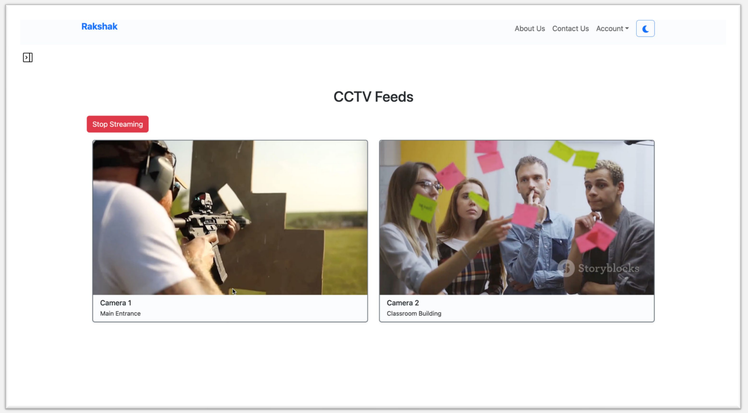

Figure 1. The CCTV feeds page.

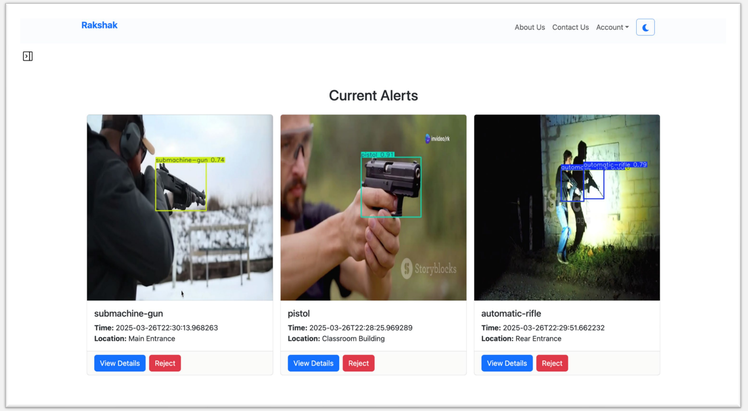

Figure 2. The current alerts page.

Features

- Detects weapons in real time from live CCTV feeds using computer vision.
- Triggers alerts instantly when a threat is detected.
- Sends automated email notifications at the moment of detection
- Handles multiple CCTV feeds running simultaneously.
- Provides role-based access control for effective management.

Business Need

With the rise in safety concerns at schools, universities, and public spaces due to incidents involving weapons, there is a growing demand for intelligent solutions to keep everyone safe. Traditional surveillance systems depend on human operators heavily, which can sometimes lead to delays or mistakes in identifying threats. Rakshak aims to change that by using advanced technology to automatically detect weapons in real time. This way, security teams can receive instant alerts and respond quickly to any potential danger.

Tech Stack

NEXT.JS · Flask · YOLO · NGINX Part of F5 · CELERY · docker

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