PROJECT - 07

Object Detection & OpenCV

DATA SCIENCE

ITX INTELLENTX
LEARNING HUB

Project - 07

Building a Security Surveillance System

PROBLEM STATEMENT

Security teams struggle with monitoring multiple video feeds simultaneously, leading to missed security events. We'll develop an automated object detection system that identifies people, vehicles, and suspicious objects in real-time using OpenCV and deep learning, enabling proactive threat detection and reducing human oversight fatigue.

OBJECTIVES

1. Real-Time Detection: Identify 20+ object classes at >15 FPS on standard hardware
2. Custom Model Integration: Combine OpenCV processing with YOLO/SSD models
3. Alert System: Trigger notifications for specific objects (weapons, intruders)
4. Deployment: Create executable for edge devices and web API
5. Optimization: Maintain accuracy while minimizing resource usage

DATASET AND SOURCES (CLICK FOR LINK)

- COCO is a large-scale object detection, segmentation, and captioning dataset. COCO has several features
- Video Feeds
- Roboflow : The world's largest collection of open source computer vision datasets and APIs.

EXPECTED OUTCOMES

1. Python executable with GUI interface
2. Pre-trained models (FP32/FP16/INT8)
3. Configuration toolkit for zone setup
4. Performance benchmark report

NEXT STEPS

1. Install OpenCV with CUDA: pip install opencv-python-headless
2. Download YOLOv7 weights: https://github.com/WongKinYiu/yolov7/releases
3. Test webcam feed: cv2.VideoCapture(0)