**Real-Time Object Detection using YOLOv8 and OpenCV**

This project performs real-time object detection using the YOLOv8 deep learning model from Ultralytics along with OpenCV for live webcam video analysis. It includes enhanced visual cues, object-specific alerts, frame rate calculation, and timestamp overlays to make it useful for practical safety monitoring and surveillance applications.

Features:

1.Real-time object detection using YOLOv8.

2.Live webcam stream analysis with object detection overlays.

**Color-coded bounding boxes:**

Red for knives (special alert).

Purple for cats.

Green for all other objects.

FPS (frames per second) counter to show performance.

Timestamp overlay to log real-time footage.

Sound alert when a knife is detected (for Windows platforms).

**Requirements**

Python 3.8 or higher

pip package manager

**Installation**

Install the required Python libraries by running:

pip install ultralytics opencv-python

**How to Run the Project**

Run the detection script using the following command:

nginx

CopyEdit

python detect.py

A webcam window will open. Press the **q** key to close the window and stop detection.

**Custom Behavior in the Script**

* The model detects 80 COCO dataset classes in real time.
* When a knife is detected:
  + The bounding box color changes to **red**.
  + A **beep sound** plays as an alert (only on Windows).
* When a cat is detected:
  + The bounding box color changes to **purple**.
* All other objects are shown with **green** bounding boxes.
* Object label and confidence score are displayed above each bounding box.
* Current time and FPS are shown on the video feed for real-time monitoring.

**Use Cases**

* School and campus security systems.
* Smart home surveillance cameras.
* Real-time safety monitoring for public areas.
* Visual analytics for AI-powered CCTV solutions.

