TEAM NAME : **DEEPTHINK**
PROJECT NAME: **SENTINEL EYE**
COLLEGE: **SRMIST, KTR**
TEAM MEMBERS: 3

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PROBLEM STATEMENT :

In retail environments, theft and suspicious activities pose significant challenges, leading to financial losses and safety concerns. Traditional surveillance systems rely heavily on human operators to continuously monitor live video feeds — a process that is both time-consuming and error-prone. Due to fatigue and human limitations, critical incidents often go unnoticed or are identified too late.

There is a growing need for an **intelligent, automated surveillance system** capable of understanding human motion patterns and detecting abnormal behavior, such as shoplifting, in real time. Such a system should not only identify suspicious activities but also alert security personnel instantly with visual evidence, ensuring faster response and improved safety management.

The **Sentinel Eye** project aims to address this challenge by developing an AI-powered shoplifting detection system that leverages **pose estimation, temporal motion analysis, and deep learning** to recognize suspicious behavior from surveillance footage and notify staff through an automated alert and dashboard mechanism.

PROJECT DESCRIPTION:

Sentinel Eye is an AI-powered surveillance system designed to detect *shoplifting or suspicious human behavior* in real time using pose estimation and deep learning.
The project processes video footage, extracts skeletal movement data using **MediaPipe**

BlazePose, tracks poses over time, models the human motion using **ST-GCN (Spatial Temporal Graph Convolutional Network) logic**, and classifies sequences using an **LSTM-based deep learning model**.

When suspicious activity is detected, **the system records evidence, saves it in a database, and sends instant WhatsApp alerts** to security staff. A **Flask web dashboard** allows staff to review, confirm, or dismiss alerts with visual evidence.

Sentinel Eye integrates *computer vision, deep learning, and automation* to build a complete AI surveillance system.

It bridges **human motion analysis (MediaPipe)** with **temporal understanding (LSTM)** and **automated incident response (alerts + dashboard)**.

The project proves how AI can assist in **crime prevention and real-time monitoring**, making it suitable for retail, malls, and public safety environments.

HOW TO RUN OUR CODE:

This project requires python environment with versions less than python 3.11.0 (here we used python 3.10.0)

Type these in terminal:

```
py -3.10 -m venv venv
.\venv\Scripts\activate
pip install -r requirements.txt
```

To run the program:

```
python sentinel_eye_live.py
```

Use this video input for checking the code: https://drive.google.com/file/d/18lciIneOIZlSROykKM1N0qVJtnWDhi6C/view?usp=sharing

(NOTE: You can change the whatsapp number in the code file to get allert messages. Make sure to keep whatsapp web open in the browser to send messages.Press ctrl+C in the terminal to terminate after the alert is sent and the video clip is stored.)

To view the dashboard:

```
python app.py
```

(NOTE: Follow the link to view the dashboard.)

SUBMISSIONS:

DEMO VIDEO DRIVE LINK (Input is feed by playing an anomaly theft video in phone and keeping it near the laptop's camera): https://drive.google.com/file/d/1-upStSB6YTz32JGmad6ZZRpTs2g29IeD/view?usp=sharing

DEMO VIDEO DRIVE LINK (Real time demo where one of our teammate acts like stealing snacks in a supermarket for evaluating our sentinel eye project in real time): https://drive.google.com/file/d/1IaOZhS0DTTO5bWD_TvfpP-8oKJjdCH2r/view?usp=sharing