## Synopsis

## **Shoplifting Detection System Using ML Model**

## # Description

## **The Shoplifting Detection System is an innovative application that leverages deep learning techniques, to identify potential shoplifting incidents. This system uses video datasets from surveillance cameras to detect suspicious activities in retail environments, aiming to enhance security, reduce theft, and increase operational efficiency.**

## **Initially, the model is trained to detect shoplifting behavior from videos captured from various store angles. Over time, the system will evolve to work with video feeds, allowing for real-time shoplifting detection and alerting. By focusing on behavioral patterns, the system can assist store personnel in taking preemptive actions, thereby preventing losses.**

## # Key Features

## **Image Data Collection: Processes surveillance videos to detect suspicious activities in real time.**

## **Data Preprocessing: Resizes, augments, and normalizes videos to improve model accuracy, and model training/validation.**

## **Model Training and Evaluation: Trained on labeled datasets and evaluated for precision, recall, and F1-score.**

## **Future Video Detection Capability: Plans to process video streams for real-time detection and alerts.**

## **User-Friendly Interface: Provides an easy interface for uploading images, viewing results, and generating reports**

## # Technologies Used

## **Python: For building and training machine learning models and developing the system backend.**

## **Google Colab/Kaggle notebook: For deep learning model development and implementation of YOLO-based detection algorithms.**

* **TensorFlow/Keras: Used for building and training the deep learning model. Specifically, layers like ConvLSTM2D, MaxPooling3D, and Dense are part of the Keras API, which is integrated into TensorFlow.**
* **Numpy: For numerical operations, such as handling image data arrays.**

## # Installation and Usage

## **Clone the repository: git clone** [GitHub - pcseai25/MP3-Shop-Guard](https://github.com/pcseai25/MP3-Shop-Guard) **Install the required dependencies: pip install -r requirements.txt**

## # Future Enhancements

## **Real-Time Video Processing: Expanding the system's capability to process live video streams from surveillance cameras for real-time shoplifting detection.**

## **Advanced Behavioral Recognition: Enhancing the model to detect more complex behavioral patterns and abnormal activities that may indicate theft.**

## **Machine Learning Optimization: Further optimization of ML models for faster inference and higher detection accuracy.**

## # Acknowledgements

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