Crime Bot

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Our Hack

CrimeBOT is a surveillance tool designed to identify porch pirates by analyzing webcam footage in real-time. It first detects faces using YOLO, assigns IDs based on similarity to track multiple people if needed, and processes the faces through two separate Convolutional Neural Network (CNN) machine learning models: one for demographic information and another for a set of 28 other attributes. These CNN's output feature vectors, which are then processed by an LLM to generate a detailed, objective description of the individual. The goal is to provide law enforcement with a quick and accurate way to identify suspects, aiding in the fight against package theft.

$12,000,000,000

worth of packages stolen by Porch Pirates in 2023.

Inspiration for this hack

One of our group members has an issue with multiple Amazon packages being stolen after moving to a new home. Due to the recurrence, Amazon no longer believes the claims and refuses to issue any refunds. Using a Ring doorbell and contacting non-emergency services, have been unsuccessful since the thefts couldn't be caught in the act. To address this, we developed CrimeBot, a system that can identify the thief when the crime occurs for quicker action.

Health & Wellness

Nine in 10 Americans are worried about stolen holiday packages, and more than a quarter are "very" or "extremely" concerned.

16 percent of suicides in the US occur in response to a financial problem.

Impact

CrimeBot is able to drastically increase the efficiency and accuracy of identifying porch pirates. By automating the process of face detection and profiling, it enables law enforcement to respond faster and without bias, reducing the time it takes to track down suspects. CrimeBot could be easily added to existing smart home security systems like Ring. The use of AI and machine learning allows for a more consistent approach, minimizing human error and bias. CrimeBot could indirectly save lives by helping reduce the financial stress caused by theft, which can lead to suicide. Package theft, especially for people relying on deliveries for essential goods, can increase financial difficulties, leaving people without items they have already paid for.

How CrimeBot Works

Yolov8-n

A YOLO model specifically trained for the identification of faces is used to detect faces as each frame comes through from the camera. The faces are cropped and sent to the next stage.

Extracting features and attributes from faces

The cropped image is preprocessed as required by the two CNN models and fed through. The first CNN extracts demographic information such as age, race, and gender, whereas the second CNN extracts other features ranging from hair color to eye shape. The extracted information is placed into feature vectors.

GPT API

The feature vectors are combined and fed through GPT API with a prompt specifically asking for a concise physical description of the suspect.

How CrimeBot Works pt.2

FastAPI

We utilized a FastAPI server to create a web server and wrap the main backend logic of CrimeBot. FastAPI also allowed us to connect the client side, or frontend, to the server and establish api endpoints.
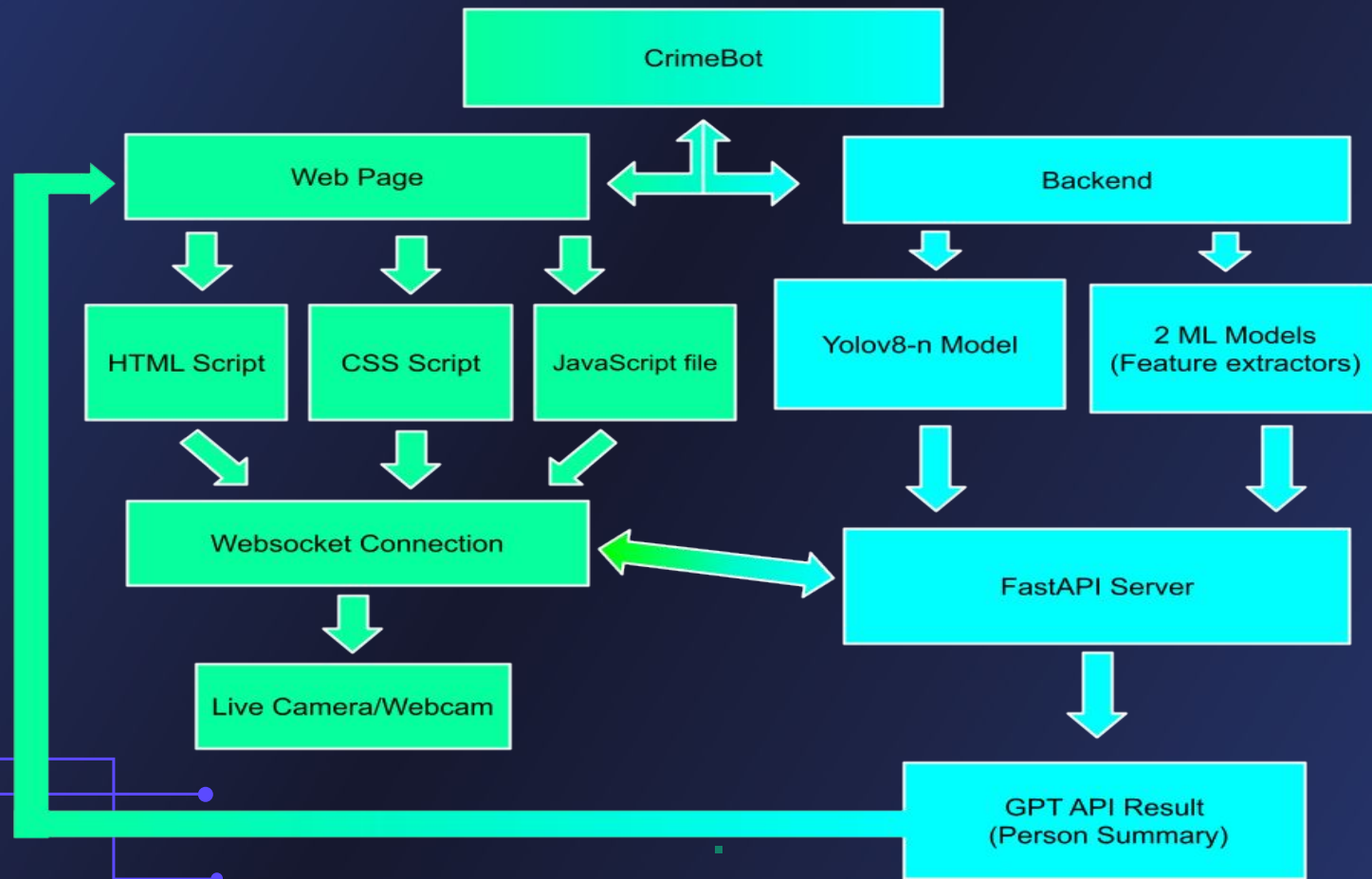
Frontend

The Frontend of CrimeBot utilized a straightforward tech stack of HTML, CSS, and JavaScript to create a simple webpage where the camera is displayed. There is simple functionality with an about me, light/dark mode toggle, and start and stop button for surveillance. The webpage is where the bounding boxes from YOLO are displayed in real-time and where the description of the person is located.

Websocket

Websocket connection was essential for this project as the open, two-way connection it provided allowed for interactivity between the frontend and server. This allowed for frames to travel to the backend and bounding boxes or summaries to be displayed on the webpage.

Simplified Visualization

Thanks!