Automatic License Plate Reader

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Agenda

1. · Introductions
2. · Problem
3. · Solution's Design
4. · Demo
5. · More To Come

Introductions

Graduation: May 2025
Major: IT Concentration Database & Programming

Have You Seen This?

Homesecuritysystems.net. (n.d.). *Top-rated home security cameras*. Retrieved October 13, 2024, from https://www.homesecuritysystems.net/?vn=newlist-camera-ratings-resp-j19-recom-cl2&topchoice=pyh&nrl=ri-ar&a=241&c=110014&s1=1972849593.1721182016&agid=1234751798281737&s4=c&gclid=7c1dda28159218faf0e7bd23dac4decd

Flock Cameras

- Used nationwide in neighborhoods, schools, and on major roadways/jurisdiction lines

- Helps Law Enforcement find suspect vehicle's potential last direction of travel

- Gathers plate, location, make and model of vehicle

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Impact of Flock Cameras

- Flock Safety cameras increase crime clearance rates by 9.1% for each additional camera per officer.

- California Highway Patrol's East Bay Surge Operation utilized Flock cameras to recover 606 stolen vehicles and arrest 329 suspects in two months.

- Flock LPR cameras provide real-time alerts, enabling law enforcement to identify and apprehend suspects more effectively.

License Plate Reader

- Easier method to find suspect vehicles in specific areas

- Allows Law Enforcement to input a plate or image of a plate to detect if plate was ever seen, the location, and the timestamp

- Helps Law Enforcement predict or narrow down suspect location

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YOUR OBJECTIVES

NARROW THE SEARCH
FOUNDATIONAL

Uses AWS Services

You will receive a few examples for each of the top suspected get-away vehicles where you will need to use custom labels to build a model to find each of them throughout the video

Clue: This will include some tough examples where you will need to experiment with different techniques

IDENTIFY THE CAR
INTERMEDIATE

May Require Coding

Additionally, you will receive one cropped image of the get-away vehicle that you need to identify in the video

Clue: This can be solved using a variety of techniques including visual search, photo hashing, or brute force

SOLVE THE CASE
ADVANCED

May Require a Pipeline

Additionally, you will only receive a license plate and need to identify the get-away vehicle from the video

Clue: This can be solved using a variety of techniques including visual search with customized chipping, brute force, or OCR

Solution's Design

- Created a program that trains a dataset of frames, that keep tracks of unique input license plates
  - Coded in Python
  - Used libraries such as OpenCV, EasyOCR, matplotlib, numpy, imutils
    - OpenCV – Object Detection
    - EasyOCR – Character Recognition
    - Imutils – Image Processing
    - PyPlot – Image Viewing

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Program Source Code

- Traverses a plate directory to save unique plates to look for

- Frames are broken down with different filters to only display the text on within the image

- Runs conditionals to determine if the text displayed is a plate

- Return the associated plate attributes such as width and height

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Prototype Demo

More To Come

- Update source code to filter images of the tags efficiently

- Develop UI/UX design to showcase this rather than from a terminal

- Include additional features such as search by tag (input text) and or search by vehicle description

- Optimize pixel compression through enlarging images being analyzed

- Gather customer feedback if deployed

Citations

- **Homesecuritysystems.net**. (n.d.). *Top-rated home security cameras*. Retrieved October 13, 2024, from https://ww.homesecuritysystems.net/?vn=newlist-camera-ratings-resp-j19-recom-cl2&topchoice=pyh&nrl=ri-ar&a=241&c=110014&s1=1972849593.1721182016&agid=12347517982817737&s4=c&gclid=7c1dda28159218faf0e7bd23dac4decd

- Nochnack, N. (n.d.). *ANPR with Python* [Source code]. GitHub. Retrieved October 13, 2024, from https://github.com/nicknochnack/ANPRwithPython

- Flock Safety. (n.d.). How Flock Safety helped solve 10% of crime in the U.S. Flock Safety. Retrieved October 13, 2024, from https://www.flocksafety.com

- Roebuck, S. (2024, September 26). CHP's crime crackdown operation shows how LPRs are helping. Police1. Retrieved October 13, 2024, from https://www.police1.com