G20-MAIT INTRA-COLLEGE HACKATHON

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Problem Statement Title: Advanced ANPR & FRS solution

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ANPR and FRS

Approach Details ⟶

Idea Details

The proposed OCR (Optical Character Recognition) model is designed to accurately detect license plates from images and is optimized for deployment on a Raspberry Pi.

The model employs a deep learning-based approach that integrates computer vision and natural language processing techniques to extract the text information from the license plate. The model utilizes a state-of-the-art object detection algorithm to identify the license plate's location within the image, followed by a character recognition module that accurately extracts the alphanumeric characters from the plate.

The model is trained on a large dataset of license plate images, augmented with various transformations and noise to enhance its robustness. To optimize the model for deployment on a Raspberry Pi, various optimizations such as model compression, quantization, and hardware acceleration are applied to reduce the model's size and improve its speed.

The proposed OCR model can be utilized in a wide range of applications such as traffic management, toll collection, and parking enforcement, and can be easily deployed on a Raspberry Pi for real-time use cases.

The project would also be available as an api deployed using Django or Flask in order to further increase its accessibility.

Use Cases →

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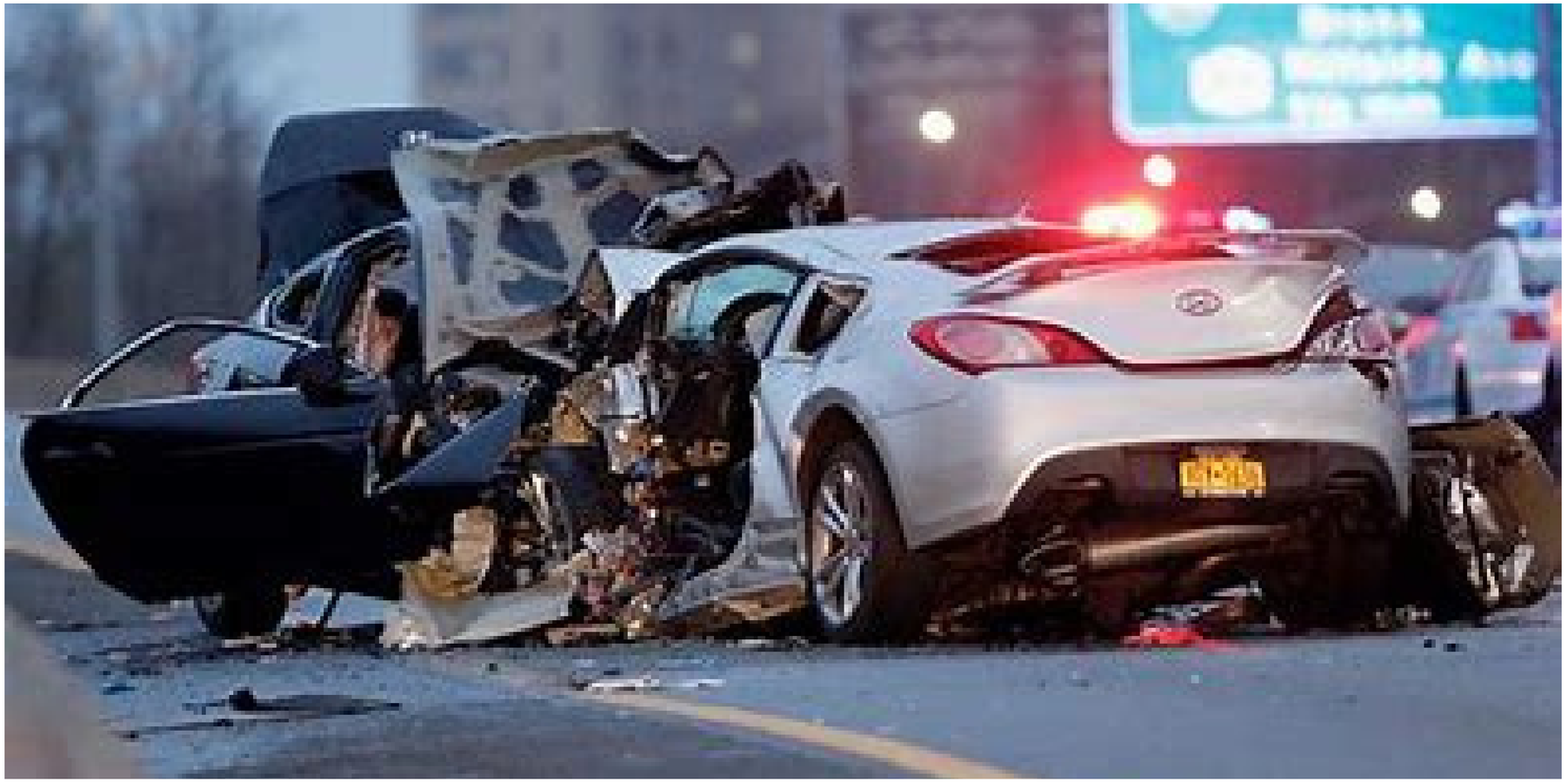
13+ LANGUAGES

AUTOMATED FIR



ACCIDENT DETECTION

TOLL COLLECTION

Use Case 1

LAW ENFORCEMENT

Primrarily, the first thing that comes into our mind when we hear the word ANPR would be to facilitate Law Enforcement. ANPR is widely used by law enforcement agencies to identify stolen vehicles, wanted criminals, and vehicles with outstanding fines or taxes. ANPR cameras can be installed on police cars, at fixed locations or at entrances and exits to car parks, which allows police to monitor and track vehicle movements.

Use Case 2

TOLL COLLECTION

Toll collection is one of the primary use cases of ANPR technology. ANPR cameras are installed at toll booths or gantries, which are typically located on highways or other major roads. When a vehicle passes through the toll booth or gantry, the ANPR camera captures an image of the vehicle's license plate and reads the license plate number using optical character recognition (OCR) software.

Key Additional Feature included: To maintain a real time database of malicious vehicles and to know their real time location and details.The model can be used in security and surveillance applications to detect and track vehicles of interest, such as stolen vehicles or those associated with criminal activity.

Use Case 3

PARKING ENFORCEMENT

The model can be used by parking enforcement agencies to detect vehicles parked illegally or those that have overstayed their time limit in a parking space.

Use Case 4

BORDER CONTROL

The model can be used by border control agencies to detect and track vehicles crossing the border and identify any vehicles associated with criminal activity or smuggling

Use Case 5

AUTOMATED INVENTORY MANAGEMENT

The model can be used in automated inventory management systems to identify and track vehicles entering or exiting a warehouse or distribution center

Bonus case

Accident detection and Automated FIR Registration:

We have often encountered cases where people are often caught recording the accident rather than actually helping the individual / reporting the accident.
Thus Now we have come up with a solution that will put this ill habit to good use.
We will implement a webpage where one can scan the number plate and it will automate an alert to the concerned authorities.

Our differentiator

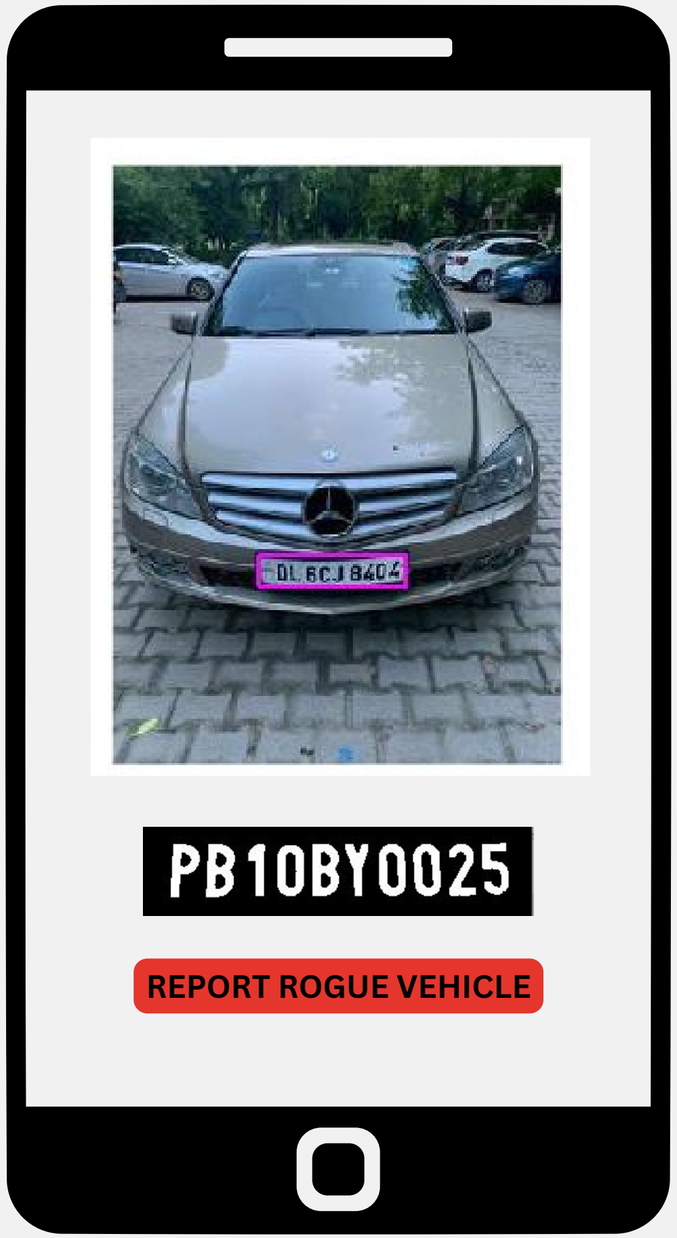
Still Not convinced?

Present day ANPR do not hold into account for different font styles.

What we offer : Our model can successfully detect number plates from wide range of font styles and 13+ Indian Languages (overall 80).

WHAT IF THERE AIN'T NO CAMERA AROUND?

The feature of our project is that we would create a webpage for general public to click a picture of the vehicles to report the accident in case there are no CCTV cameras around



NO PARKING

Another primal feature of our project is that we would provide a link on the same webpage to cater to the individuals who face the issue of unauthorized parking in front of their home. The would be able to report this issue for the authorities to tow the vehicle away.

WORKING IN 13 INDIAN LANGUAGES

Here are some glimpses of Lisence Plate detection from our model even in Regional languages

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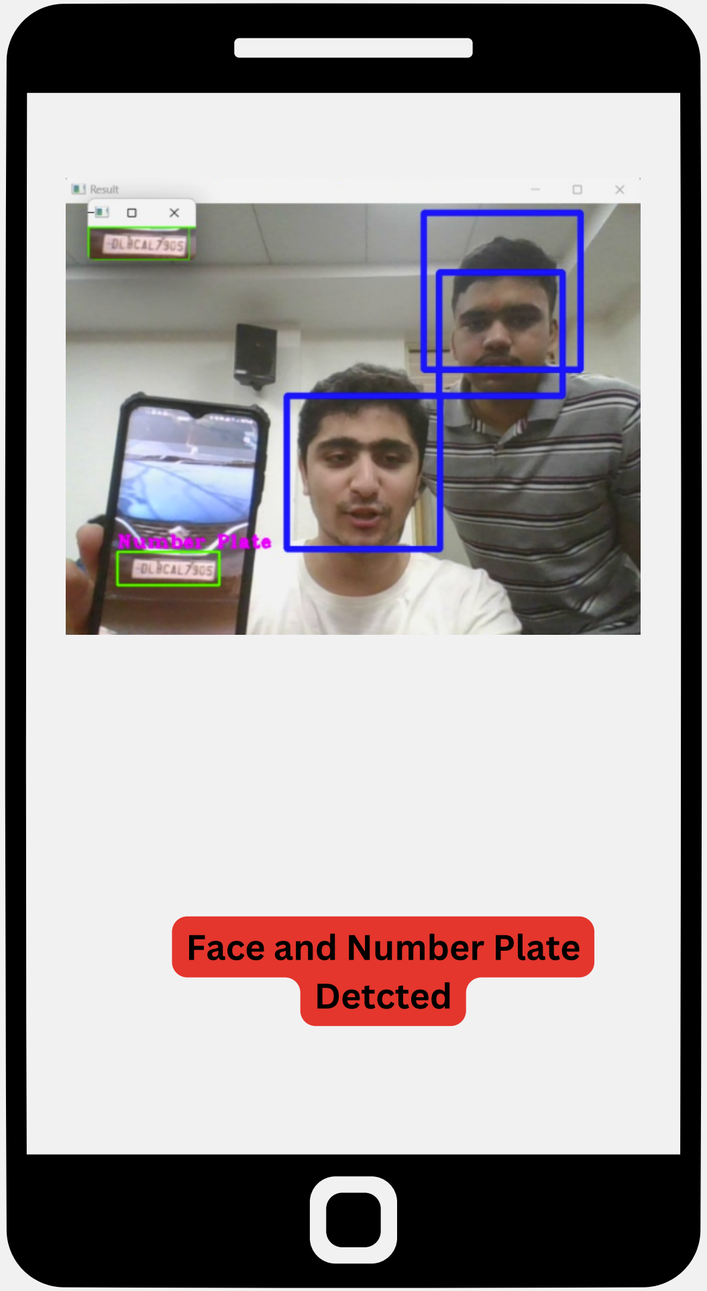

FACES AND NUMBER PLATE DETECTED

Here are some glimpses of Lisence Plate detection from our model .

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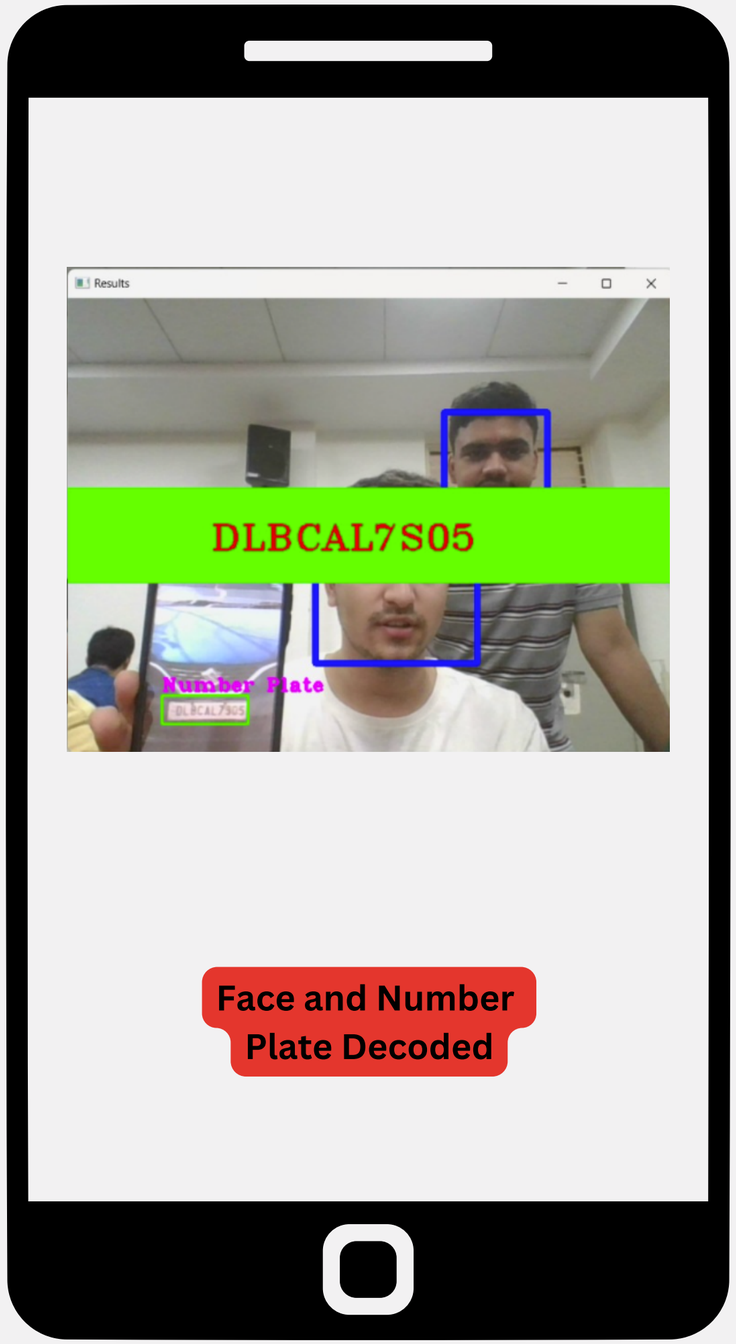

Face and Number Plate Decoded

FRS AND ANPR

Here are some glimpses of our model which implements FRS and ANPR.

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Tech Stack

Details regarding the libraries and packages used in the project

OpenCv

Tensorflow

Keras

CNN

Django/Flask

CV2

PaddlePaddle

EasyOCR

Team Member Details

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