Traffic Management

Problem Statement:

In the urban areas, the people use to break the signal, Over speed and unauthorized lane usage which to unsafety of the other peoples. Manually monitoring of such problem is very difficult and hence there is a need to be of the automated system which will detect the number plate of the vehicle and store its text into the system whereas to keep the record of each of the vehicles.

Solution:

We have planned to design a system in such a way that will detect and recognize the number plate of each of the vehicle – Car / Bike and then store into the system where there is no need of the human and the whole tracking system can handle and maintain without any errors.

Algorithms used for this:

1. Yolo v8 model – This Algorithm is used in order to detect the number plate of the vehicle → [For this we used the library: Ultralytics]
2. Open CV – This is used for the Image Pre-Processing for the image preprocessing and analysing.
3. Image Cropping (Open CV) – This is used to take the cropped image separately for the processing to take the text.
4. Easy OCR – This is used convert the Cropped image into the text i.e. (Text Recognition).
5. Streamlet – This algorithm is used for the deployment of the data into the real time.

Libraries Used:

1. !pip install untralytics
2. !pip install opencv-python
3. !pip install matplotlib
4. !pip install pandas
5. !pip install easyocr

Deployment Using the Streamlit Application:

- I have deployed the streamlit application using the ngrok platform. The “ngrok platform” is creating and giving the token for the deployment of the model.
- It is a free and open source platform to deploy the application.

Steps :-

1. Create a directory
2. Add the files:-

- requirement.txt
- images
- app.py -> which will have the streamlit code for the deployment
- best.pt -> A Yolo model

3. Install the ngrok platform and get the “token”
4. And finally deploy the application of the streamlit using the “ngrok”.
5. Get the Https link : to open the application real time.

Outputs: -

1. Image Processing and detecting the outlining of the plate:-

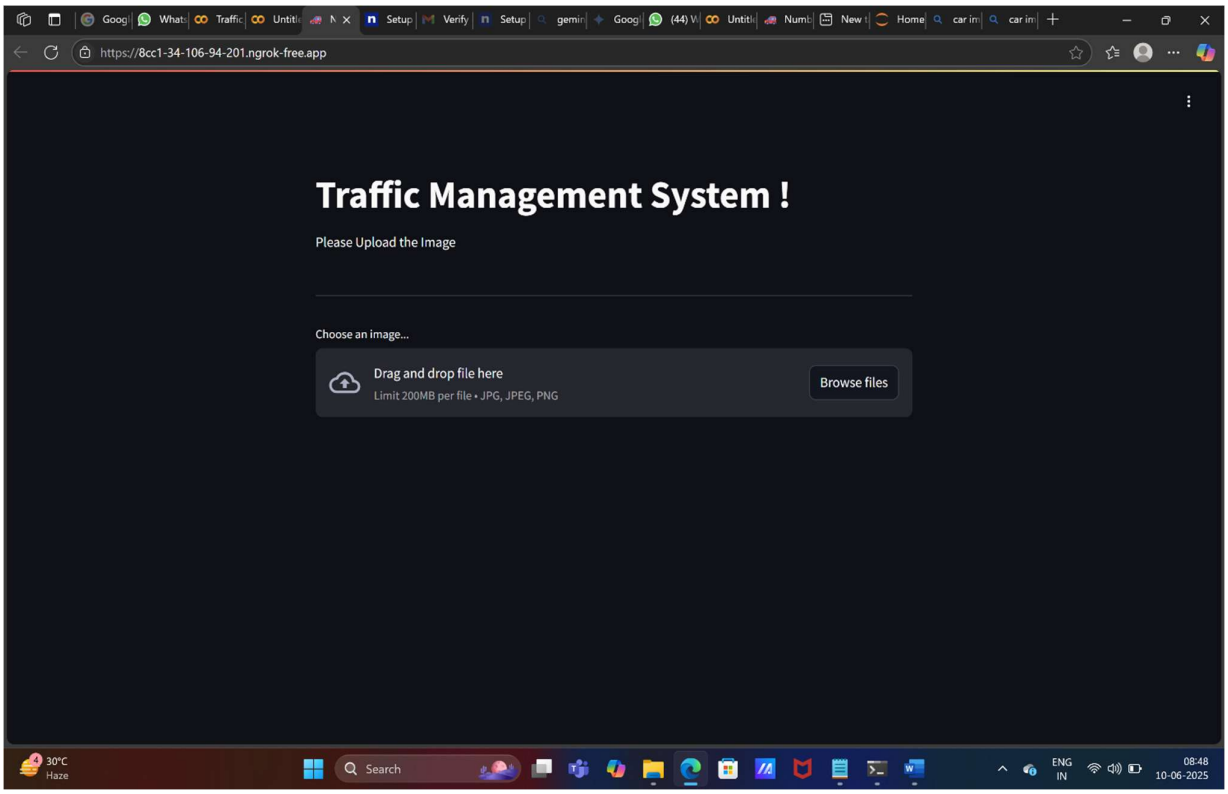
2. Cropping the Number Plate of the car:

Number plate Of Car

3. **Applying the OCR to detect the Text: i.e Text Recognition**

Text: IT2O BOM

4. **Deployment:- (Using Streamlit)**



In this app –

- **Through this app we can detect the Car → Detect the number plate of the car(Making the outlining box) → Convert into the text(Using the easy OCR)**
- **Through this we can maintain the record of the vehicles.**

Link Of Streamlit : https://8cc1-34-106-94-201.ngrok-free.app/