

Recognizing Persian and English license plate **Deep learning** **networks**



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What is this application?

This program can recognize license in two different language

- Persian plates
- English plates





02

How it works

How it works



In this program, you need to upload a photo of a car to the app. The app will analyze the picture, recognize the license plate, and detect the letters. It will then provide you with an image of the detected plate and letters. You must also select whether your car's license plate is in English or Persian, and the app will give you the number from the plate, Please note that it is recommended to use a high-quality photo for better results.

This program has a User Interface built with streamlit

If you want run this app follow these steps:

- Open the CMD
- Install the streamlit
- Go in your folder app like: C:/Users/man/Desktop/.../programfolder/
- Write this: streamlit run exe.py



PLATE DETECTION APPLICATION

Please Enter Your Image Car



Drag and drop file here

Limit 200MB per file

Browse files

This is the Ui app

You need to click the 'Browse files' button and select your photo from your computer

Please Enter Your Image Car



Drag and drop file here

Limit 200MB per file

Browse files



44.jpg 196.7KB

Successfully Uploaded



Select the plate



پلاک ایران



English plate

Done

1

Once a photo is uploaded it process and gets data through it and cut out the plate. After identifying each letter it draws a line around each one and then they're ready for display



2

This photo is what we uploaded at first step

3

And you need to select one of these two option for process and click Done



Select the plate

- ☒ پلاک ایران
- ☐ English plate


Done

...در حال تشخیص حروف



Then you have numbers
and letters of a plate as a
text (string variable)

27SIN14282



**In to the
following page
we will go
through
English plates.**



Select the plate

☐ پلاک ایران

☒ English plate

Done

Processing..

Sw333T



This photo is what we
uploaded at first step

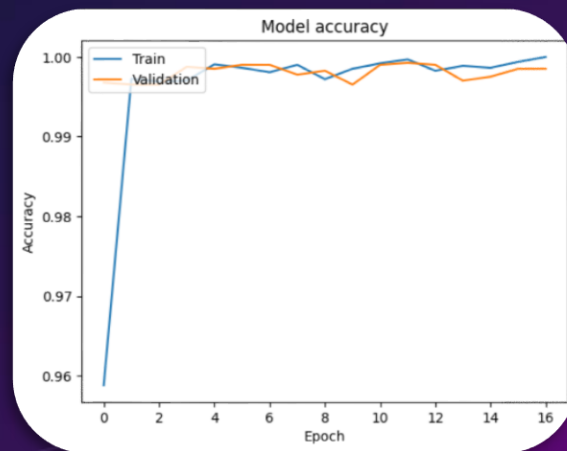
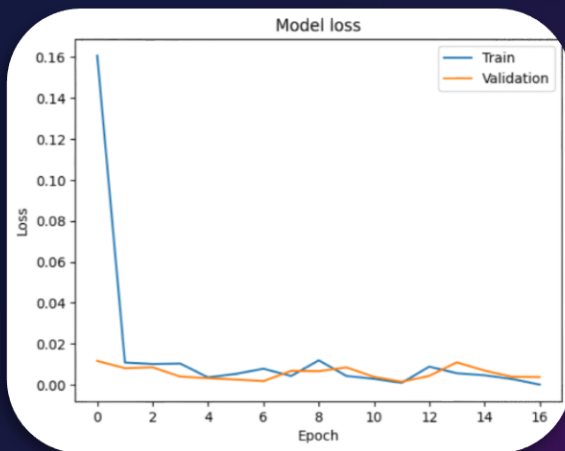


03

Requirements and programming's steps

First step(plate_alphba.ipynb)

I worked on word recognition to individually identify each character in different forms. For example, even a low-quality or damaged number seven was recognized. I used a dataset of Persian letters from Iran, which gave very good results, In this project, deep learning networks were used, and the model was a multi-class classification where a category was assigned to each letter. By using batch normalization and dropout layers, an accuracy of 1.0 was achieved ,And the trained model was saved with the name (alefba_model2.h5)



The second step(YOLO.ipynb)

In this section, YOLO version 8 was used for training. A foreign dataset, containing many images of various license plates along with the exact positions of the plates, was utilized. After training for several epochs, good results were achieved, and the model was able to make accurate predictions for the plate coordinates. These coordinates are then drawn using a line with the help of the Matplotlib library, And the trained model was saved with the name (plate.pt)



The third step(letter_plate_detection.ipynb)

In this section, I loaded the models and used the license plate coordinate detection model to analyze the image and crop it. I wrote code using the OpenCV library to draw bounding boxes around any letters or objects in the image and save the new image. Additionally, the alphabet model was used to recognize each of these cropped images. There were many errors in this phase, but a series of conditions helped reduce these errors significantly. In this section, I added another feature to the model for recognizing English letters and numbers using the EasyOCR library. And then I made all the steps functional.

The final step(exe.py)

In this section, all the functional models were added in an organized manner and made ready for use. The Streamlit user interface was utilized for easier access, as explained above, In this section, the license plate cropping model was set up so that one image, named lp.jpg, contains the cropped photo with the letter detection lines, while the second image, lp_en.jpg, is just the cropped license plate used for the English plate section. The output of the license plate characters is in the form of a string.

Thanks!

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Does anyone have any questions?

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