Vehicle Number Plate Detection

YouTube Link:
https://youtu.be/TC810hOK9CM
GitHub link:
https://github.com/Naveen131298/Vehicle_Num_Plate_Detection

CT/DT Number: CT20172275899
Contestant Name: M.Naveen
College Name: Manakula Vinayagar Institute of Technology
Puducherry

1. Background

- Identify the license place in the image and do an OCR to extract the characters from the detected license plate
- To solve the problem I've used Machine learning, TensorFlow Object detection and tesseract

2. Your Understanding

- To create and train a model that will detect the number plate of any input image and to recognize the characters in the detected number plate
- I have provided with the JSON file contains the URL of the image with its corresponding position of the number plate, width and height of the image
- Once, the model is trained now the model is ready to detect the number plate of any input image, after detecting the number plate the model should perform optical character recognition on the detected image and print text as an output

3. Scope

- URL of the image, label, points, width, and height of the elements are considered to solve the problem
- Using the points, width, and height of the image to focus only number plate of the car image and to extract the text present on it
- Number plate of the car image is considered

4. Out of Scope

- Notes and extras are the elements are not considered to solve the problem
- The text area that is available on the image other than the number plate place is not considered

5. Assumptions

- Given JSON file is the Dataset to train the model

- 200 images are used as a train dataset and 37 image are used as a test dataset

6. Solution Approach

- To detect the number plate using single class object detection
- Models used is faster_ faster_rcnn_incetion_v2_coco model

7. Implementation Framework

- First to read data from the given JSON file and store it in the variable of the python program
- Using request module get the image from the browser through URL and save the images
- Split the images into two datasets train data and test data
- Create a CSV file for test and train data the CSV file contains name of the image, label, width, height, xmin, ymin, xmax, ymax
- Creating train.record and test.record through TensorFlow record generator
- I have used TensorFlow object detection API to train my model
- To detect the number plate I have used faster_rcnn_incetion_v2_coco model
- After generating the record configure the model with the path of the model, train data, test data and number of class to be identified
- Now train the model
- Create a program to evaluate the model, the model is loaded into the program when a image is provided it will return the coordinates of the image where number plate is detected
- Using the coordinates of the number plate OCR is applied to detect the character present in the number plate
- Hardware used is nvidia graphics to train the image and 8GB RAM
- Software used is pycharm ide and tensorflow api

8. Solution Submission

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9. Appendix

To improve accuracy of the model

10. References

https://www.pyimagesearch.com/2018/08/20/opencv-text-detection-east-text-detector/

https://www.geeksforgeeks.org/ml-training-image-classifier-using-tensorflow-object-detection-api/