MINI - PROJECT REPORT ON

"*Automatic Number Plate Recognition*"

BY

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CERTIFICATE

This is to certify that the Mini- Project report entitled

" *Automatic Number Plate Recognition* "

Submitted by

Dhiraj N. Dabhade

is a record of bonafide work carried out by them, under my guidance, in partial fulfillment of the requirement for the Second Year of Engineering (Computer) at M.I.T. School of Engineering, Pune under MIT Art, Design & Technology University.

Date: 07/08/2021   Place:

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<div align="right">Dhiraj Dabhade</div>

Contents

Abstract

Automatic Number Plate Recognition has been a subject for many practical applications. It has three stages: Automatic Number Plate detection, Character Segmentation and Character Recognition. The main aim of this project is to detect the number plate characters from image. We have used Transfer learning technique to detect number plate. We have got an accuracy of 69.76% using the car-plate-detection dataset on the model.

Introduction

In the last few years, Automatic Number Plate Recognition (ANPR) systems have become widely used in the safety, the security, and the commercial aspects. Automation is the most common term in the electronics industry. Through automation, existing technologies have undergone a revolution. This paper makes use of SSD Mobnet, with a pre-trained model, which is customized to undergo 10,000 steps. SSD has two components: a backbone model and SSD head. Backbone model usually is a pre-trained image classification network as a feature extractor. This is typically a network like ResNet trained on ImageNet from which the final fully connected classification layer has been removed. We are thus left with a deep neural network that is able to extract semantic meaning from the input image 'while preserving the spatial structure of the image albeit at a lower resolution. It acts as the brain of the project. SSD uses a matching phase while training, to match the appropriate anchor box with the bounding boxes of each ground truth object within an image. Essentially, the anchor box with the highest degree of overlap with an object is responsible for predicting that object's class and its location. Basically, the operating system for the detection of vehicle number plates has been done using this technology.

For the recognition purpose, we are currently using a 5mp camera via our computer and processing the result in the same as a prototype model to check the viability and feasibility beforehand. Identifying a license plate from tiny and distorted pictures will reveal a lot of effort. One answer is to use a CCD camera with panning, tilting, and zooming (PTZ) capturing functions [2]. Different researchers have proposed different techniques for every step and an individual technique has its own advantages and disadvantages. The method for recognizing license plates includes the three main steps. It is a region of extraction of interest, plate number extraction and character recognition. The system which we are

developing recognizes a ten digit license plate which could be also modified to detect various other types of license plates as well

Problem Definition

The manual work of checking and registering number plates of the cars entering an University can cause security issues. The safety can be reassured and manual work can be reduced by introducing ANPR
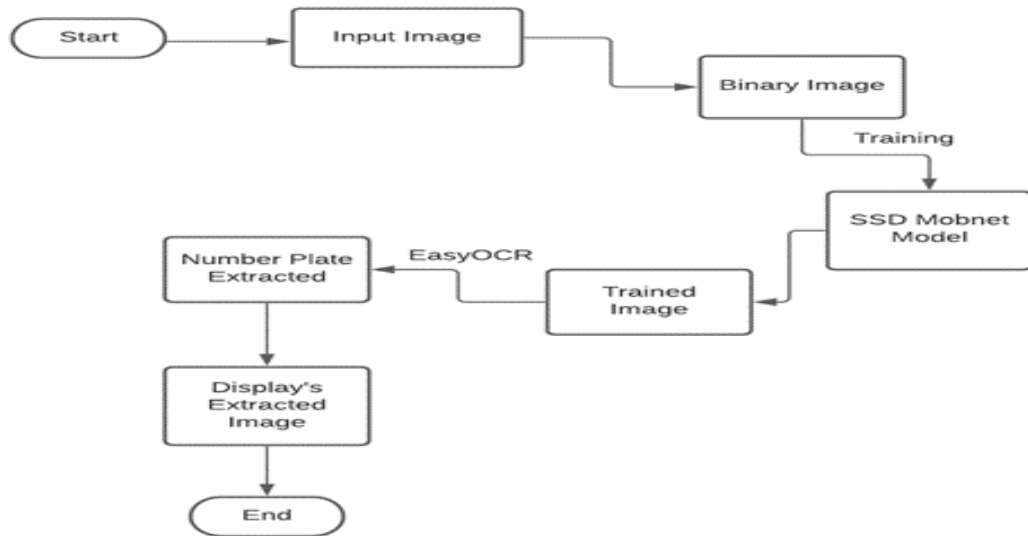
Features of Project

The system captures an image from camera then that image will be converted into binary image file to increase the processing speed and that binary image is pass to the SSD Mobnet Model for training. The text from the trained image is extracted using EasyOCR.
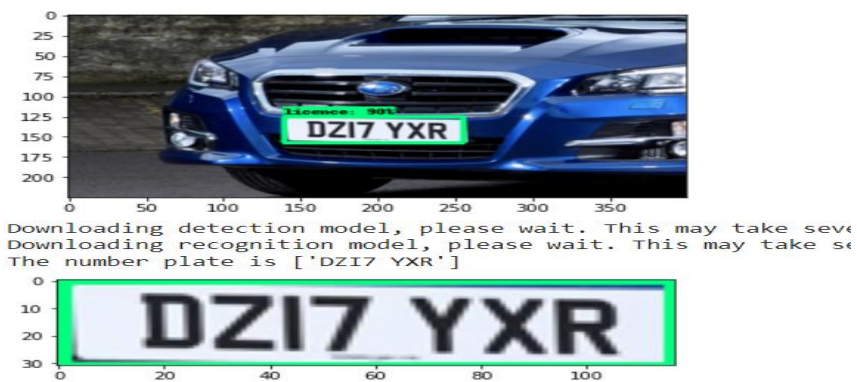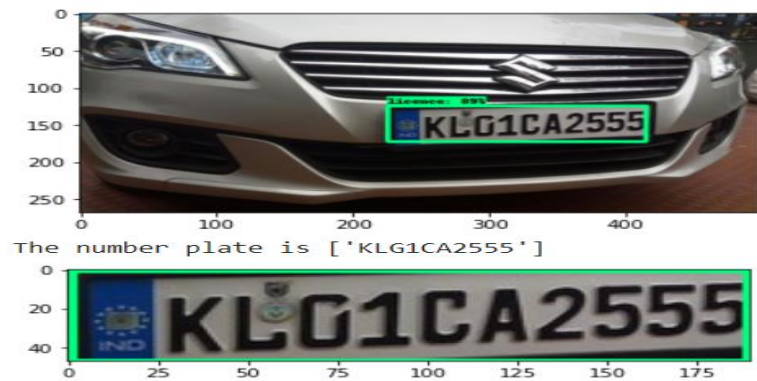
Platform/Technology

- **Platform –VSCode**.

- **Technologies Used –**
    - Programming Language – Python
    - OpenCv
    - Tensor flow
    - Object Detection API
    - EasyOCR

Block Diagram

Output


```
Downloading detection model, please wait. This may take seve
Downloading recognition model, please wait. This may take se
The number plate is ['DZI7 YXR']
```

The number plate is ['KLG1CA2555']

The number plate is ['6526 JHD']

Applications of Project

1. **Parking**

   Parking automation and parking security: ticketless parking fee management, parking access automation, vehicle location guidance and car theft prevention.

2. **Access Control**

   Access control in general is a mechanism for limiting access to areas and resources based on users' identities and their membership in various predefined groups.

3. **Motorway Road Tolling**

License plate recognition is mostly used as a very efficient enforcement tool, while there are road tolling systems based solely on license plate recognition too.

4. **Border Control**

   Efficient border control significantly decreases the rate of violent crime and increases the society's security. ANPR adds significant value by event logging, establishing investigate-able databases of border crossings, alarming on suspicious passings, and many more.

5. **Journey Time Measurement**

   Data collected by license plate recognition systems can be used in many ways after processing: feeding back information to road users to increase traffic security, helping efficient law enforcement, optimizing traffic routes, reducing costs and time, etc.

6. **Law Enforcement**

   Automatic number plate recognition is an ideal technology to be used for law enforcement purposes. It is able to automatically identify stolen cars based on the up-to-date blacklist. Other very common law enforcement applications are red-light enforcement and over speed charging and bus lane control.

Conclusion

The automatic vehicle identification system plays an important role in detecting security threat. The system use series of image processing techniques for identifying the vehicle from the dataset stored in the PC. The system is implemented in Tensorflow and Keras.