

# VEHICLE NUMBER PLATE DETECTION USING IMAGE PROCESSING

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**Abstract** – The main objective of this project is to reduce the criminal activity like stolen vehicle, road traffic monitoring that involve use of motor vehicles. In this project we will be processing the image of the vehicle such that the vehicle number from the image will be extracted. Using that extracted image i.e. the vehicle number we will be comparing that number from our database to check whether that vehicle belongs to correct person or not and we will also be checking the documents belongs to that vehicle are complete or not. Using that detail, we will be giving challan if they are suspected.

**Key Words:** VNPR, Optical character Recognition, Image processing, Segmentation, Challan.

## 1. INTRODUCTION

To identify a vehicle there is a unique identification number given to each vehicle i.e. vehicle plate number. Vehicle plate number helps us to identify the vehicle uniquely. Our project is based on same detecting the vehicle number from CCTV i.e. closed-circuit television or using input image then taking actions on the vehicle and their owners if they are suspected under any crime. In this project we will be extracting the Number of vehicle from number plate using a technique called vehicle number plate detection. In this technique we will be performing several methods step by step to find the vehicle number. Then using that vehicle number found we will be comparing that number from our database and if they are found guilty or suspected for any reason then they will have to give challan. In our technique a copy of challan will be sent to their email id and their mobile number. Challan can be issued for various reason like documentation not complete or helmet not their or any issue. This technology can be used 24/7 in Distribution centres, Hospitals, Schools, Car parking, Highway toll collection, Borders and even those places where there are chances of more accident and crime and even is those areas where there is more traffic.

## 2. METHODOLOGY USED

In this technology we will be working on CCTV footage or input image given. The CCTV footage must be clear to extract the Vehicle number from the image taken as Input. The brightness and contrast must be clear and the number plate must be in format according to given by Indian government. The following methods is used in this technology: -

- a) Image capturing from camera
- b) RGB to Gray scale
- c) Detect license plate from image
- d) Character segmentation from number plate
- e) Character recognition
- f) Display vehicle number
- g) Comparing Number with database
- h) Challan if suspected

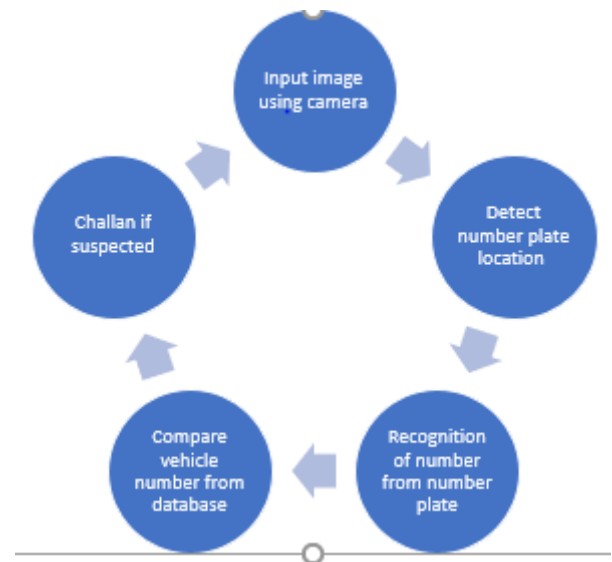


Figure 1:-Block Diagram

### 1.1 Image Capturing from Camera

In this method we will be capturing the image from CCTV footage. The image which is captured is in RGB format. We will be performing further methods on this RGB image only using Technology Vehicle Number Plate Detection. The function used to read image as input is given below: -

```

im = imread(imagefilename);
axes(handles.axes1);
imshow(im);
  
```

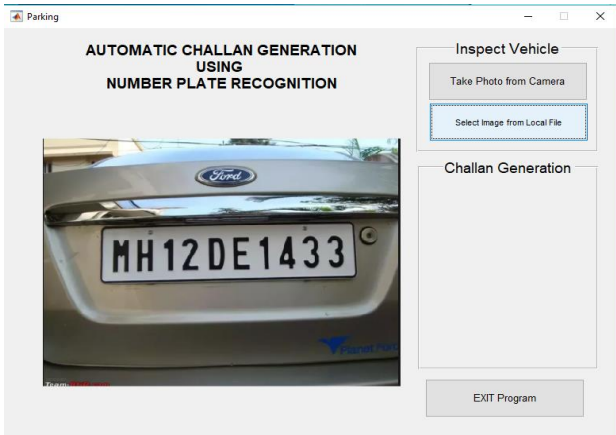


Figure 2:-Car Image

### 1.2 RGB to GRAY scale

In this method we will work on the image taken as the input from the CCTV footage which is in RGB format. We will be converting that image into gray scale using MATLAB.



Figure 3:-RGB to Gray Format

### 1.3 Detect License plate from image

In this method we will be working on the image which was converted to gray scale from RGB format. We will detect the number plate from the gray scale image using the MATLAB function. We will be performing further more methods on that number plate detected using the given function: -

```
numberplate = find_number_plate(im);
numpl = char(numberplate);
numpl = numpl';
```



Figure 4: - Number Plate Detected

### 1.4 Character segmentation from number plate

In this method we will be working on the image which is extracted from the gray scale image i.e. the number plate which is detected. We will divide each character of the number plate which is being detected to find the number from number plate. We will be performing further more methods on the segmented image.

### 1.5 Character Recognition

In this method we will be working on the segmented image of each character. We will detect each character using OCR technique i.e. optical character recognition. Here each character is recognized individually. Then those character are combined to form a whole number that is present on the number plate which is taken in the form of image.

### 1.6 Display Vehicle Number

After performing all the methods of vehicle number plate detection using MATLAB. We will be displaying that number on the screen.

```
disp(numpl);
```

### 1.7 Comparing Vehicle Number from Database

In this method we will be working on the vehicle number which is being saved in the notepad file. We will match the vehicle number from our database. If the number plate is not found in the database there is an option given to create that vehicle number database. This option is only available to admin. A sample code is given below: -  
VehicleData = FetchDatabase ();

```
if iscell(VehicleData) % == 'No Data'
```

```
choice = questdlg('No Vehicle data Available in Database.Would you like to create a new entry?', ...
```

```
'Vehicle Databse Query Menu', ...
```

```
'Yes','No','Cancel');
```

### 1.8 Challan if Suspected

In this method we will create challan on the vehicle and vehicle owner if they are found guilty for any reason. Challan will be created on the basis of documentation if they are not complete like insurance, PUC i.e. pollution under control, road tax, or even if you not following driving rules like helmet not present, front or back light not present any fault will cause to challan. The challan will be send to owner mobile number and even to their email id. They have to submit the challan within 7 days.

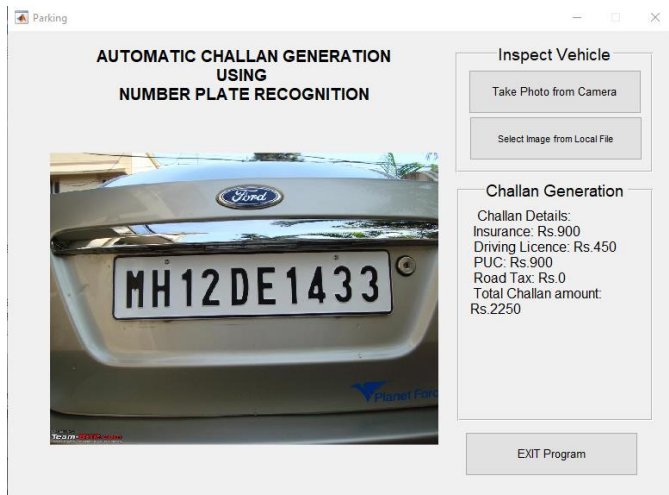


Figure 5: -Challan Generation

## 2.APPLICATIONS

- Traffic control: - This technology can be used to control traffic in those areas where there are chances of more crimes.
- Airport: - This technology can be used at airport parking to reduce frauds.
- Tolling: -This technology can be used at tolling poll to collect challan if anyone found guilty for not following traffic rules.
- Reduce paper work: - This technology is more advance as challan will be sent directly to owner's mobile number, email and a copy of it will be saved.

## 3.CONCLUSION

In this, a software is designed which detect the vehicle number plate number using MATLAB. In this software we have also included challan system as if the owner is found guilty for breaking any of traffic rules then he/she will be sent a challan information to their email and mobile number and they have to pay the challan to within 7 days. There is some condition for this software to work: -

- Vehicle plate should be white and according to rule given by government of India.
- Image should be clear.

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