

## Image Processing Based Traffic Roadway Monitoring and Control System (ANPR) for Security

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**Abstract:** In Traffic guidance, Detection and Tracking of the number plate from the vehicle is an very important task, which demands intelligent solution. In this paper, we are analyse the extraction and Recognition of number plate from vehicles image. And it can be done using image processing software i.e. Matlab. It is assumed that images of the vehicle have been captured from movable Digital Camera. We have fitted the moving cameras on the top of signal pole or also at the centre of circle. Then with help of this image of number plate Alphanumeric Characters which are present on number plate has been Extracted and recognized using template images of alphanumeric characters. The image of number plate which are Extracted image of the number can be seen in a text file for verification purpose. Then with help of this image of number plate, the traffic police or any observer compare with database which stored already of all numbers. with the help of verification text file So they will easily find the person who breaks the rules and he will be fined.

**Keywords:** Matlab, Camera, License plate localization, Character segmentation, Character recognition.

### 1. INTRODUCTION

The ANPR work is generally depends on following steps: Number plate extraction, character segmentation and character recognition. Extraction and recognition of Number plate is highly searching area in the field of image processing. It is assumed that this algorithm worked on images which have been captured from movable Digital Camera. We will fit the moving cameras on the top of signal pole or also at the centre of circle. It is also assumed the vehicle is stationary and image of number plate of vehicle are captured at fixed distance. There are many different of running or operating system have been developed but each has its own advantages and disadvantages.

An running system is developed using image processing software i.e. MATLAB in which image is captured from moving camera and for pre-processing

technique, captured image of number plate converted in RGB image format to Gray scale image. After conversion, erosion process takes place and dilation process is applied on image and unwanted holes in image have been filled. After all the process has been done of dilation, process of horizontal and vertical edge has been done which creates histograms and passed these histograms through low pass filters. Low pass filters are used to filter out unwanted noise from image. After this filtering, image is segmented and region of interest is extracted and image is converted into binary form. Binary images are easily processed as compared to coloured images. After converting the image into binary, each alphanumeric character on number plate is extracted and then recognized with the help of template images of alphanumeric characters. After this, each alphanumeric character is stored in file and whole number plate is extracted successfully.

Traditional system is effective but is limited by the time human can work. Human intervention is there to take clever, critical decision and handle emergencies. Traffic policemen decide time for traffic signal control depending on the density at particular lanes.

In this project we modify the techniques using moving cameras. If someone breaks the signal at that time picture or image of number plate of vehicle will captured by moving cameras. Then with help of this image of number plate, the traffic police compare with database of all numbers. So they will easily find the person who breaks the rules. Traffic observation, control and real-time management is one of the major components within future intelligent transportation systems (ITS).

### 2. RELATED WORK

Manisha Rathore and Saroj Kumari [3] paper presents a new algorithm in MATLAB which has been used to extract the number plate from the vehicle in various luminance conditions. Extracted image of the number plate can be seen in a text file for verification purpose.

M. M. Shidore, S. P. Narote [4] paper presents due to variations in the representation of number plates, vehicle number plate extraction, character segmentation and recognition are crucial. They have presented the number plate extraction, character segmentation and recognition work, with English characters. Number plate extraction is done using Sobel filter, morphological operations and connected component analysis.

ANPR can be used to store the images captured by the cameras as well as the text from the license plate, with some configurable to store a photograph of the driver. Systems commonly use infrared lighting to allow the camera to take the picture at any time of the day[1].

### 3. PROPOSED METHODOLOGY

#### BLOCK DIAGRAM

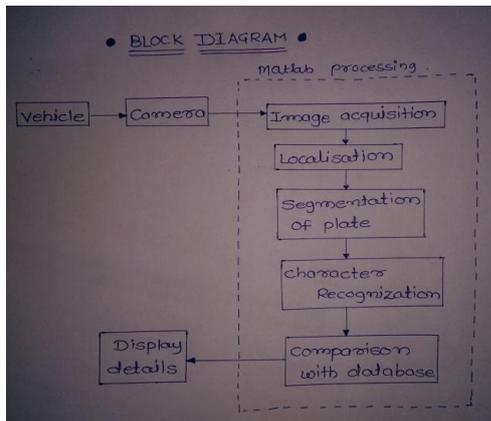


Fig 1: Block Diagram

**Pre-processing-** The automatic number plate recognition system faces many challenges. So, to deal with this challenges pre-processing is essential to enhance the input image and making it more suitable for the next processing steps. It is the first stage in the proposed methodology. The preprocessing includes four main steps as mentioned below :

**Conversion of input image to gray scale :** In this step the input color image is read, show as well as resize to be sampled and it is converted to a gray scale image. We need to filter the image in order to remove the noise present in it and every filter needs an input image in gray scale format. Hence it is required to convert the input image to gray scale image.

**Filtering :** The gray scale image is applied for filtering. Filtering is done in order to remove the noise in the image. In this type of noise some black and white spots are added to the original image which are removed after filtering.

**Edge Detection:** After filtering the image is applied to edge detection. Here we have convert original image into integer format and convolution takes place for edge detection.

**Extraction:** In this step we extract the required part of image and remove the other part of image. To get the required image part by removing the unnecessary part of the mask image is subtracted from the edge detected image. After all the processing character, numbers are recognized. The image of number plate which are Extracted image of the number can be seen in a text file for verification purpose. Then with help of this image of number plate, the traffic police or any observer compare with database which stored already of all numbers. With the help of verification text files So they will easily find the person who breaks the rules and he will be fined.

Methodology is shown in flowchart. All the process is followed step by step for Pre-processing of image. MATLAB software have large library functions and set of tools.

There are some main features of Matlab are as follows:

1. It provides advanced algorithm for high numerical arithmetical operation.
2. Matlab having the ability to defie user define functions and also it has large collection of mathematical functions.
3. For displaying one image in different formats as well as for plotting and displaying data, two and three dimensional graphics are supported.
4. In Matlab software there are Powerful, effective and efficient matrix and vector oriented high level programming language is provided.

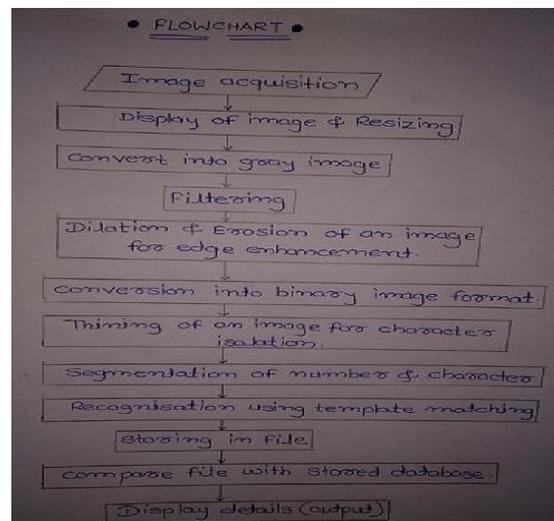


Fig 2: Flowchart

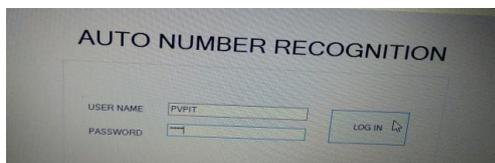
**4. EXPERIMENTAL RESULTS**

All the figures shows the results that satisfies the aim our project.



**Fig 3:**

fig.3 shows image is captured from digital moving camera. Image should be taken from fixed angle parallel to horizon. Vehicle should be constant position.



**Fig 4:**

After image acquisition from moving camera, user can access by user ID and password for further process.



**Fig 5:**

Fig 5 shows LOG IN details.



**Fig 6:**

By clicking on READ button we will get the detail information of the person. So we can easily find guilty person.

Total no. of plates	Total no.of number plates displayed in matlab	Details observed	Identification
10	10	All no. plates display the details	100%

**5. CONCLUSION**

The experimental results show that, number plates are extracted faithfully and algorithm works satisfactorily.

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