

IDENTIFICATION OF VEHICLE NUMBER PLATE USING ADAPTIVE TECHNIQUE

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ABSTRACT: The Automatic Number Plate Recognition system is based on image processing technology. These systems are required for present scenario and designed to detect the vehicle number plate. In today's world with the increasing number of vehicle day to day life and it is impossible to manually keep a record of the vehicles in the traffic. This method improves the efficiency and utilizes it at any time required. The main objective of this project is to design an efficient automatic vehicle identification system by using Vertical Edge Detection Algorithm. This system will capture the vehicle image as soon as the vehicle reaches the security checking area. The captured images are then extracted by using the segmentation procedure. Optical character identification is used to identify the characters. After data is obtained then compared with the data which is available at their database. This system is implemented and simulated in MATLAB for real images. This system is mainly designed for the purpose of security system and improves the efficiency of 94% compared to existing method.

Keywords: Vertical Edge Detection Algorithm, Gray Processing, Image Acquisition, Image Binarization, Template Matching.

I.INTRODUCTION

The increasing number of vehicle in present's days it's impossible to keep a manually record of the entire vehicles. It's need to be a man standing 24*7 to note down entire details. It's a time consuming process and require man workforce. Further more the data stored manually is un clarity after a long time. So to overcome all these limitations and to develop a system which will automatically detect the number plate and store it in its database. This method also helps to get the accurate result to compared to manually one.

First working involves that as soon as the vehicle entered the secured area the system automatically captures the images and stores it. Which takes size only in KB. So, we can store a lot of record in such minor space and also it would be easy to match records of criminals using this digital

information. Because images taken by the camera would be of large size and storing thousands of image would waste a lot of time and memory space. So we need such a system which can reduce complexity. This processing of the image is done through the software stored in the system.

If the vehicle matches the already stored information then it's allowed to pass the gate and if the vehicle is not recognized or if its marked in the blocked list then it's not allowed to cross the gate and further checking process are followed.

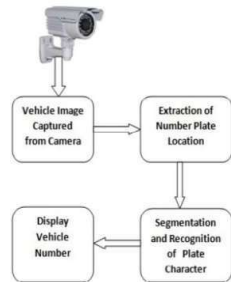


FIGURE 1: SYSTEM BLOCK DIAGRAM



FIGURE 2: CAMERA CAPTURING AREA

The system will apply certain algorithm to evaluate the vehicle image. Then, the images will be add to, locate the vehicle plate position and take out the characters from the vehicle plate.

The system will try to match the accepted vehicle plate number with the vehicle number plate database. If “Access Granted”, the gate will open and allowed the vehicle to pass through.

The Vehicle Number Plate Recognition also present an advantage by storing the image of the vehicle in which it will be useful for crime fighting. Speed of the vehicle, weather condition, type of Vehicle, distance between vehicle number plate and the camera, type of plate (Rectangular, Bent type) Vehicle number plate point of reference and type of vehicle font character are the variables that affect efficiency and accuracy of recognition system.

II. METHODOLOGY

The original and the mainly key part in this procedure is the software model. The software model use image processing technology by using MATLAB. The algorithm is separated into follow parts:

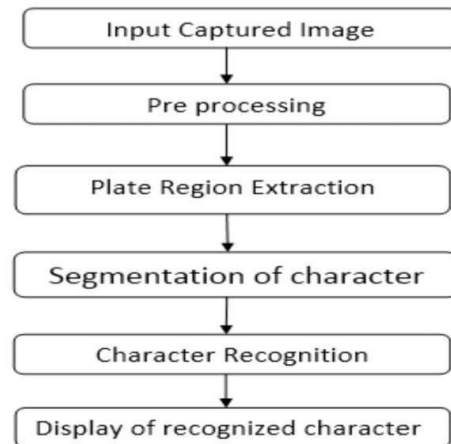


FIGURE 3: IMAGE PROCESSING STEP

Capture of Image:

The first step is the capturing of image. The image is captured by electronic tool. Digital Camera or Webcam.

The image captured is stored in JPEG layout. Later it changed in to gray scale image in MATLAB.

Pre-processing:

The first step after capture the image is the pre processing of the image. When the image is captured there is lot of disturbances and noise present in the image for which the image can't be used suitably. So in this step the noises from the image are mandatory to be cleared to obtain an accurate result.

a. Gray Processing: This stride involve the modify of image in to Gray levels. Color images are changed in to Gray image. According to the Red, Green, Blue(R,G,B)significance in the image, it estimate the value of gray value, and obtains the gray image at the same point in time.

b. Median Filtering: Media filtering is the footstep to eliminate the noise from the image. Gray level can't eliminate the noises. So to make image free from noise media filtering is use.

Plate region extraction:

The mainly important stage is the origin of number plate from image significantly. The extraction can be made by using image segmentation method. There are several image segmentation methods available in various literatures.

In mainly of the methods image binarization is use. In this footstep get the output of extracted number plate using

grouping components, and then separate each character and split the each and every character in the number plate image by using split and also find the length of the number plate, then find the relationship and database if together the value is equal means it will create the value 0-9 and A - Z, and finally convert the significance to string and display it in edit box, and also store the character in some text file in this code.

Following figure shows the segmentedcharacters.



FIGURE 4 : CHARACTER RECOGNITION

The character recognition is now used to compare the each individual character with the character stored in the database uses the relationship method to match the characters.

And if both the character matches then it displays the allowed otherwise it will display the not permitted.

III.HARDWARE MODEL

The hardware model consists microcontroller for controlling the complete hardware of the VEDA system. The VEDA algorithm on a PC receives the image and performs the processing, which yield the vehicle number.

This Number is then compared to regular database and at last provides signal to microcontroller to control the system hardware. If the input plate contains the approved number then the green indication light will be switched ON and if the input plate contains an not permitted number then red indication will be switched-ON.

IV.FLOW CHART

The above flowchart describes about the process of identification of vehicle number plate. By using this process we can identify the vehicle number plate. By using the digital camera image is being captured, so image acquisition is used in this process.

The next step involved in this process is image is going to be converted into gray image. Gray image is mono colour image used to identify the information.

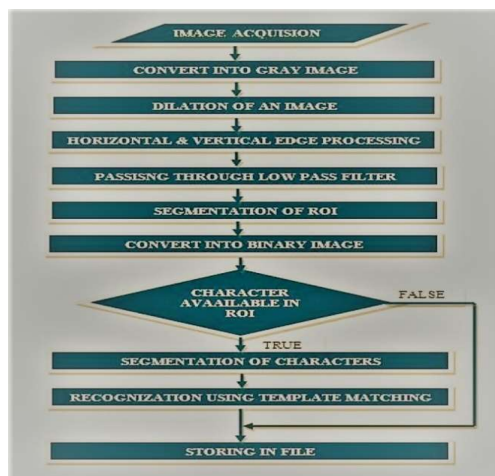


FIGURE 5: FLOW CHART

The next process which is used is in this process is Dilation. It is used for filling

holes in the image and it sharpens the edges of an object and this dilation used to maximise the brightness which is used in the image and connect the broken lines. So for this purpose dilation is used.

The horizontal and vertical edge processing is used to represent the row wise and column wise differences of which is used in gray scale values among the pixel. The horizontal processing is calculated by each column and vertical processing is calculated by each row.

These horizontal and vertical processing histograms (rectangles whose area is proportional to the frequency of the variable) pass through the low pass filters because the values between the histogram are together changes the rows and column. This minimize the loss of information between the rows and columns.

The low filter is used in this process is used to remove all the unwanted region which is used in the image. So, we have to pass the histogram through the low pass filter. Then we have to make the process of image segmentation to identify the license plate in the process. Then we have to extract the image through the horizontal and vertical with highest possibility of containing the number plate.

Finally the image is converted into Gray image to binary image. Because to calculate the intensity change value easily. It is easy to calculate in binary compared to gray and color image. Next we have to segment the alphanumeric characters in the image. With the process of above flowchart the identification of vehicle number plate is completed.

APPLICATIONS

- ☐ Traffic control and airport
- ☐ Reduce paper work
- ☐ Parking security and ticketless parking fee management
- ☐ Tolling
- ☐ Vehicle location guidance.
- ☐ Improve the road safety
- ☐ Rotten vehicle

Advantage by storing the image of the vehicle in which it will be useful for crime fighting. Speed of the vehicle, weather condition, type of Vehicle, distance between vehicle number plate and the camera, type of plate (Rectangular, Bent type) Vehicle number plate point of reference and type of vehicle font character are the variables that affect efficiency and accuracy of recognition system.

V.RESULT

In this project we are mainly focused on vision based system for effective detection and counting of vehicles running on roads.

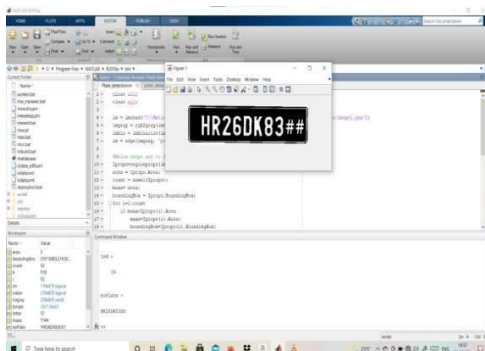


FIGURE 6 : OUTPUT

```
Plate_detection
ind = 16
noPlate =H
ind = 11
noPlate =HR
ind =34
noPlate =HR2
ind = 35
noPlate =HR26
ind =6
noPlate =HR2D
ind = 8
noPlate =HR2D
ind = 34
noPlate =HR2DK
ind = 38
noPlate =HR2DK8
ind = 19
noPlate =HR2DK83
ind = 19
noPlate =HR2DK83##
```

VI.CONCLUSION

Finally the implementation of the number plate identification is successfully verified. The algorithm which is implemented in this project detects the number plate region from the image. Mainly this project has been implemented for the number plate system for security purpose that could not replace the current system. The existing methodologies and the proposed systems are used to implement the identification of number plate successfully. So, finally the number plate recognition is implemented in the current system successfully

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