Automatic License Plate Recognition System (ALPR): A Review

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Abstract - Automatic license plate recognition is a special form of optical character recognition. Now a day ALPR is Necessary for the payment of fee in parking, bridges, toll plaza etc. It consist mainly three major techniques:1. Processing the image 2.Character Extraction 3.Character matching. In processing the image 'identify vehicle with number plate. In this median filter is used to remove the noise from the image. In character extraction Morphological and Dilation process is used which check all the dimension, edge, color, font etc... And in last character matching correlation process will be occur to check all the digits. In this paper mainly introducing Median filter, Morphological process and Template to find out the best results of ALPR .

Keywords- Automatic License Plate Recognition (ALPR), Preprocessing, Character Extraction

I. INTRODUCTION

AUTOMATIC LICENSE PLATE RECOGNITION is an essential part in traffic system .Due to increasing population, traffic are also increasing gradually day by day .So due to this number plate recognition are used for the purpose of effective control. Each vehicle identify easily by their number plates, no external tag/information required. ANPR system means transformation of data between the real environment and information systems. In ALPR systems commonly use infrared lighting to allow the camera to take the picture at any time of day or night. When a vehicle enters an input gate, number plate is automatically recognized and stored in data base. When a vehicle later exits the parking area through an output gate, number plate is recognized again and paired with the first-one stored in the database. Vehicle registration plate is attached to a vehicle for their official identification purpose.

The information extracted from the license plates is mainly used for traffic monitoring, access control, parking, tolling, and border control. This technology is used in many companies to grant access only to vehicles of authorized personnel.

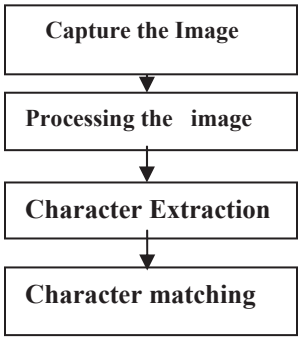

Fig. 1.(ANPR System)

II.STEPS

A. Capturing the images : In this process a high resolution analog/digital camera is to capture the image Fig .2.

Fig.2

B. Processing the image: In this process firstly gray scale conversion is used to convert the image from RGB to grayscale. After that image will be resized by resize function. Then median filter is used to remove the salt and pepper noise

Fig.3

From the image as shown in the Fig.3.we used 3x 3 masks to get pixels and their gray values.

C. Character extraction: After median filtering process we used smearing process to find out the text area from the plate and we get the erode image Fig.4 and then we applied morphological process to remove the unwanted edges of the plate as shown in Fig.5.it also include dilation process. Dilation mean to fill the gap/ to separate the character from the image and after that each character is cut separately from done by finding starting and end points of characters in horizontal and vertical
Direction. Characters cut from the plate areas as shown in Fig.6

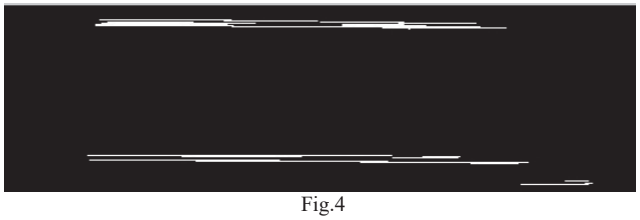

Fig.4

Fig.5

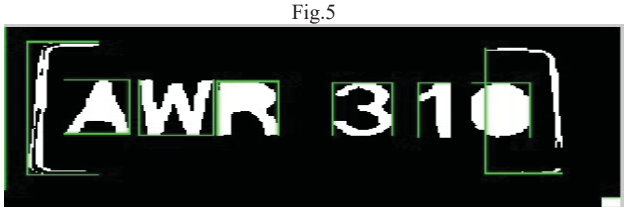

Fig.6

D. Character matching: Before the character matching, normalization process is occurring in order to normalize the character means not to include any other white or extra spaces in all the four sides of the character. Then each character is fit to equal size as shown in Fig.7.

Fig.7

Then we use correlation technique to match the each letter and number with the list of character that are saved in template .after exact matching our number plate

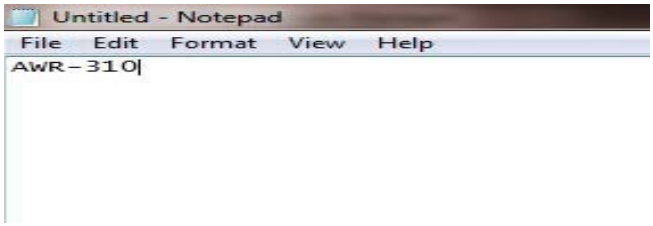

Fig.8

Letters will show in notepad. Fig.8

III.LITERATURE SURVEY

Shan Du, Mahmud Ibrahim, M. Shehat , W. Badawy [1],describe a paper with many ALPR techniques according to their feature and there steps. Comparisons is also shown by Pros, Cons, Recognition results, and Speeds.

S Roy, A. Choudhury, J.Mukherjee [4] proposed a paper on the license plate of West Bengal(India). This paper use morphological and Sobel edge detection method to find out each number separately and after removing noise represents histogram equalization for contrasting the image.

Kumar Parasuraman and P.Vasantha Kumar [5]
Described the paper in 3 parts with smart, simple and efficient algorithm. Proposed like extraction of image, Segmentation of character and recognition of plate number. Performance of proposed algorithm has been done on real images.

Saha.S, Basu.S, Nasipuri.M, Basu.D.K described the paper of automatic license plate recognition with a combination of labeling, Thresholding,and region props method for plate localization. Segmentation is done by horizontal and vertical scanning and in last step described the process of template matching for character matching.

IV. CONCLUSION AND FUTURE WORK

Automatic License Plate Recognition is the main key in many traffic applications. In this paper some efforts are applied in order to find out some successful results in automatic license plate recognition. The system has been tested on many images by the techniques Match filter, Morphological process, Edge Detection, and Template Matching.
In future these methods can be implemented on real time application and can be used neural networks and soft implementing technology to find out good results. For example: it can't work for some different type of license plate such as two row plate. These types of problem can be solved in further work.

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