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REVIEW PAPER ON AUTOMATIC VEHICLE NUMBER PLATE DETECTION AND RECOGNITION USING IMAGE PROCESSING

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ABSTRACT:-*Automatic Number Plate Detection And Recognition is a framework which is utilized to perceive the vehicle number plate from a picture having a still and moving photo of a vehicle. It is a noteworthy improvement in the innovation which is utilized to law execution and movement controlling. The adjustments in the number plate sort and natural conditions are considered in this undertaking. This innovation utilizes particular sort of cameras to track and distinguish the vehicles number and track their action effectively. Due to sudden increment in vehicles over the world it is extremely testing assignment to keep up record of every one of these vehicles and to discover unlawful exercises effectively. Hence it is critical to monitor every one of these vehicles by the separate experts. To make their enormous assignment basic this method is created which help them a ton in their management.*

KeyWords *- Automatic Number Plate Recognition, Feature Selection, input image, preprocessing, Filtering, Extraction, edge enhancement, Segmentation, recognition.*

1. INTRODUCTION

Automated number plate recognition is a very relevant topic that is gaining importance. With the amount of accidents taking place each year, this tool can be used in monitoring the speed of vehicles. This could also be used in reducing bottlenecks at toll centers. One could also design a system wherein the vehicle license plate detection provides added convenience of automatically charging a driver's bank account instead of having to stop and pay providing better traffic congestion information.

The first step in the recognition process is obtaining a photo of vehicle usually by use of a mounted CCD camera. After this, some type of algorithm must be perform to transform an image to a string consisting of the license plate number.

One would require doing basic preprocessing like image enhancement, plate area localisation and noise reduction. An important characteristics of a license plate is its definite rectangular shape, which can also be exploited for localization purposes. This would have to be followed by Image segmentation, where individual characters. are identified based on their orientation. A simple way to localize these features is to examine edge and variance as information.

This can be done by applying a Sobel Operator and obtaining the image gradient. A thresholding algorithm then can be applied to obtain a binary edge image. A local variance image can be obtained by sliding a Window across the image and calculating the variance within each window. Combining these, areas of high activity can be localized.
Finally character recognition could be performed on the number plate.
Morphological operators like dilation and erosion could be used for recognizing shapes of the letters.

2. LITERATURE REVIEW

Under literature review we studied the various research paper on number plate recognition system,following table shows methodologies and their limitations mentioned in respective research paper.

Sr. No.	Name of paper	Year of publish	Methodology used	Result	Limitations
1.	Efficient Method for Vehicle Number Plate Extraction and Character Segmentation.	2010	Removing the Plate region, edge location calculation and vertical projection technique are utilized.	Final system Efficiency=80%	The proposed strategy is basically intended for constant Malaysian Number plate.
2.	Vehicle number plate recognition using multiple layer back propagation neural networks.	2011	For the Number plate acknowledgment initially picture transformation in paired and apply to neural system, and apply mpl calculation, at that point recognition singular image, by network mapping.	average recognition rate..	The caught picture 2-3 meters detracted from the cameras.
3.	Indian vehicle Number plate extraction and segmentation.	2011	(1)Preprocessing of Image by histogram adjustment. (2)Extraction of plate locale by edge discovery calculation(3)Segmentation of characters (4)Median filtering all above methods.	General exactness of our framework is 84.00%.	proposed strategy is touchy to the point of view, physical appearance and environmental conditions.
4.	A Real-Time License Plate Recognition System for Saudi Arabia using lab view.	2012	Image Enhancement.Then setting Morphological Operations like dilation and erosion Character Segmentation and Recognition by neuron execution.	work normal in the ongoing condition.	for the overall system, while the some more work is to be done to make the technique more efficient.
5.	Automatic License Plate Recognition(ALPR): A State –of –the -Art Review.	2013	The authors considered the different variations in number plates detection.	This method have accuracy is nearly about 75%	Difficulties looked by ANPDR is chiefly ecological issues or the varieties in the tag. Different elements which incorporate are recently the plate situating.

3.PROPOSED WORK

In our project we design a method which are used for detecting the Number plate. Following figure shows the block diagram of proposed number plate detection and recognition system.

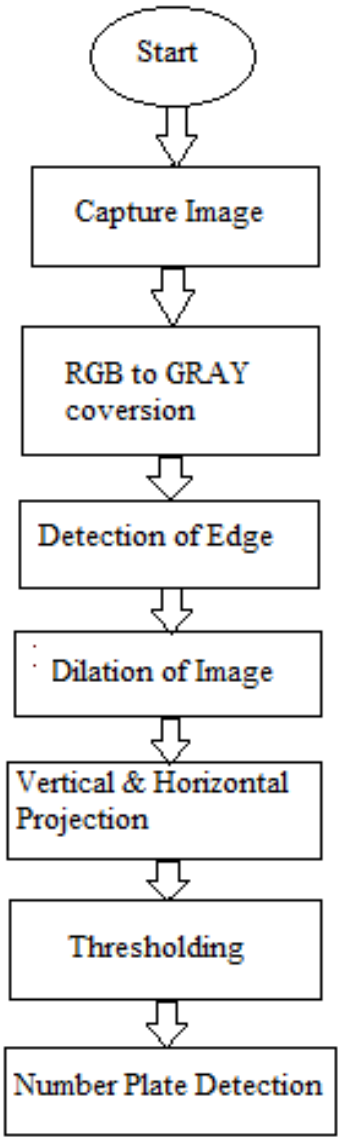

Fig. 1.Basic Working Model of ANPDR

Following are the steps which are apply on image to detect the number plate of vehicles.
In this venture, the vehicle picture is taken by a great CCTV camera which is changed over to gray scale picture.
This strategy does not depends upon color introduce in the picture. So if the information is color picture (which is takenas a 3D array in Matlab), is transformed into a grey image (which is represented as 2D array in Matlab) before applying further steps on an image.
To change over a caught RGB picture into a gray scale picture we take the RGB estimations of the pixels and after that take its normal esteems from every one of the channels:
Grayscale value of image pixel =(R+G+B)/3
R=Red color pixel
G=Green color pixel
B=Blue color pixel

Detection of Edge:
The Sobel operator performs a 2-D spatial gradient measurement on an image and so emphasizes regions of high spatial frequency that correspond to edges. Typically it is used to find the approximate absolute gradient magnitude at each point in an input grayscale image.

Image Dilation:
Picture Dilation is a procedure of enhancing the nature of the given picture by sharpning the edges and limits. It additionally builds the brightness of a picture. It can remove the noise.Dilation adds pixel to the limits of objects in a picture. The quantity of pixels that depend on size and shape of structuring element.
Hence by sharpening the image, it enhances the edge detection.

Horizontal and vertical edge Detection of an image:
Histogram is a graphical representation of the dissemination
of grayscale esteems between neighboring pixels of a picture regarding column wise and row wise operations. In this venture, we have utilized horizontal and vertical histogram equilization.In above advances the calculation is experiencing every section of the picture. It is beginning from the second pixel of every segment and comparing it with the threshold values. Edge esteem is the contrast between the first and the second pixel of the required section.
At that point distinction between second pixel and third pixel is ascertained, and if the distinction surpasses the edge esteem it is added to the total of the distinctions until the point when it moves to the finish of the section. Presently toward its finish, an array is made which contains the section wise sum of differences. A similar procedure is completed to as far as column operation to locate the vertical histogram.
The vertical and horizontal Projection of a picture gives a region of enthusiasm for a specific course.
In this area. the projection in level and vertical course is figured. what's more, discover the data about required range.

Thresholding of image by OTSU method:
In digital image processing, OTSU technique is utilized for picture thresholding. It is the decrease of greyscale picture into binary arrangement of an image.The picture comprises of two sections, foreground and background. This technique computes the optimal thresholding. Isolating the two sections of the picture with the goal their combined spread is minimum or their variance is maximum.

Filtering of garbage regions in an image:
After the completion of the above stage a filter is applied to remove unwanted garbage value region from the image from the picture. In this , the undesirable zones are the lines and sections with bring down histogram values.

Extraction of region contacting license plate:
Presently the thresholding strategy is performed which removes all the regions with less histogram values and just region which is left has the most histogram values which is the zone of interest. This is the area of number plate.

4. CONCLUSION

With the assistance of writing an literature review and a few outcomes the conclusion is determined that the automatic vehicle number plate recognition technique performs viably on an info picture. Furthermore, the vehicle number plate location was accomplished effectively. A few parameters affects the recognition of the number plate like determination of the camera, commotion show in a picture, detection of vehicle in the obscurity, seeing point, and so forth. In future work we will take a shot at conquer these parameters.

5. ACKNOWLEDGMENT

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