Number Plate Processing for implementing Pollution Fine and Vehicle Restriction

Hemant Kumar Prajapati¹ & Dr. Neeraj Manglani²
¹M.Tech. Scholar, Dept. of Computer Science
Jagannath Nath University, Jaipur, India
²Associate Professor, Dept. of Computer Science
Jagannath Nath University, Jaipur, India

Abstract - The fundamental point of this work is to make the modules for Traffic direction utilizing number plate location framework. This module ought to get a part of the gained picture as the information and is expected to give back the number in editable type of tag. For the most part, the framework is expected to remember a wide range of tags. The assortment of them is gigantic. They are of various shapes and hues, letters can be orchestrated in more than one column. For instance in India tags is white foundation with dark letters. Presently the High Security Registration Plate Scheme (HSRP) was propelled in 2011, not quite the same as the old configuration. It has chromium-based 3D image with "IND" in blue is recorded utilizing hot stamping foil and a one of a kind Permanent Consecutive Identification Number [3]. In this work just the single line plates with dark letters on white foundation are accepted as the right as it were. A tag acknowledgment framework by and large comprises of three fundamental parts viz. Tag Localization, Characters division and Recognition. Aside from that we have additionally extended our examination work to contamination fine execution and vehicle passage confinement for specific region, vehicle which are over 10 years of age.

Keywords— Number Plate Recognition, License Plate, Pollution Fine control

1. INTRODUCTION

Tag location assumes a noteworthy part on the planet since vehicles are expanding step by step and contamination is additionally expanding because of expansion of vehicle number. In this paper we present the contamination fine control in this we force fine on the vehicle proprietor whose contamination check date is lapsed. At the concentrated city of trade movement and the new sort fabricating, all have republic parking areas or underground parking garages, however the parking spot is not in any case enough, so how to deal with the parking garages proficiently, ease of use the parking spot effectively, enhance the effectiveness of administration and lessen the expense of administration, turn into a significance question. Parking garages has a man to execute vehicle control and charge physically, however not have vehicle go in and out constantly, subsequently this sort of administration is extremely squander difficult work and time. In this way utilization of programmed tag acknowledgment framework, precisely can achieve mechanization of parking garages to diminish the expense of administration, to screen and enhance the ease of use of parking areas. In the traffic angle, to avoid of traffic accident and search for of vehicles stolen, because of number of police individual is insufficient, if just utilize individual to perceive the tag number, we will couldn't achieve the objective quickly, subsequently to set up a programmed tag acknowledgment framework, we can following the experience vehicles as well as spare the majority of labor to enhance perceived effectiveness.

The pictures of different vehicles have been obtained; from there on submit to the Matlab programming where they are first resize the picture and after that changed over into grayscale pictures. At that point we utilize middle channel to evacuate the commotion in the picture. Shine, complexity and power changes are made to ideal qualities to upgrade the number plate and its digits. The yield is spared in a content box.

Whatever is left of the paper is composed as Section-II shows the related examination of the proposed work. Area III depicts the structural configuration of proposed work. Segment IV expounds the techniques of proposed framework. Segment V highlights the trial set up and comes about lastly Section-VI finishes up the proposed work.

II. BACKGROUND AND RELATED WORK

Presently, there is a ton of exploration on tag acknowledgment in acknowledgment zone. More often than not, tag acknowledgment is partitioned into five sections: info picture, picture pretreatment, tag area, character division, character acknowledgment.
In the initial two sections, some normal strategies are generally utilized, for example, Grayscale picture, Intensity Transformation Image. The capacity of the initial two stages is to hunt down the tag in a more precise manner. It is a reality that the principal most vital stride of vehicles tag acknowledgment framework is to searcher and restricts the tag. This location step could extraordinarily influence the rate and precision of the entire programmed tag acknowledgment framework.

In past examination, the most common system is the strategies in view of edge insights, which depend on the rule that the change of splendor in the tag district is more surprising and more successive than somewhere else. In any case, they barely can be connected to complex pictures because of their affectability to the undesirable edges.

J. Lafferty, A. McCallum, and F. Pereira [6] joined edge measurements with morphological strides to take out undesirable edges in the handled pictures. Then again, some methodologies exploit shading highlights. Advanced picture preparing utilized three shading red green and blue then it change over RGB shading to dark utilizing picture handling as a part of division and character coordinating stride.

C.-N. E. Anagnostopoulos, I. E. Anagnostopoulos, I. D. Psoroulas [7] makes another and powerful approach of tag area. The accompanying three key areas are included in this proposed calculation. Firstly, Sobel administrator is utilized to extricate the vertical edges of the vehicle picture. At that point, HSV shading space and indispensable picture are utilized to find competitors in yellow tags and non-yellow tags. At long last associated segment investigation is utilized to find the tag precisely.

Similarly H. Bai and C. Liu [8] likewise utilizes a shading based strategy, yet in which the shading data from the hues picture is sensibly used to enormously diminish the edge focuses. With this strategy, it likewise dispenses with the unsettling influences of the fake plate district whose structure and surface are like the vehicle plate yet don't coordinate the plate altered shading collocation.

In the F. Faradji, A. H. Rezaie, and M. Ziaratban [10] article, firstly writers align the License Plate, utilizing the dim level quality to alter the light and for the character partition and alteration of the integrality. They utilized the Black top-cap innovation to wipe out the shadow and get an ideal presentation. At long last, they utilized back-proliferation neural system to perceive every character.

In the K.-H. Lin, H. Tang, and T. S. Huang [11]’s license plate character recognition part, it introduce the method which is improved BP Neural Network to recognize the Character. There are three layers, which are input layer, hidden layer and output layer, in this design. If the BP neural network would identify English characters, the output layer neuron number should be 5. This method could improve the accuracy and training speed. Moreover, another important advantage is to avoid falling into local minimum points.

C. N. E. Anagnostopoulos, I. E. Anagnostopoulos [12] portrays a format coordinating technique. One database ought to be existed. Case in point, for acknowledgment of English and advanced letters, there are 26 letters and 10 computerized letters in the database. At that point they utilized the estimation to coordinate the format and judged whether it coordinates or not. It additionally presented the comparative strategy for distinguishing proof of the character.

W. Jia, H. Zhang, X. He, and M. Piccardi [15], utilizes differential strategy to search for the position of tag. Initially he utilized advanced camera or CCD to get the computerized shading picture, and move it into the dark level picture. Since the tag has the high complexity in the dark level picture, so we can recognize the distinctive quality between the pixels by utilizing the "BW channel". At that point they get the BW picture, and need to discover the position of tag.

W. Jia, H. Zhang, and X. He [16], additionally proposed in the early time, the ways to deal with find tag and search for the edge of the tag for finding the definite position. This technique is found specifically by recognizing the character of the tag. Since the shade of the character and the tag have a solid difference, So they figure the frequencies for the alterable shading, and decide the tag zone by utilizing the shading change esteem.

III. ARCHITECTURAL DESIGN OF PROPOSED WORK

Figure 1 displays the engineering configuration of our proposed arrangement of Traffic control utilizing Number Plate Detection. In this work we have performed information preprocessing as the initial step of number plate identification.
Fig. 1. Process flow diagram
A. The general portrayal of the configuration determination as appeared in above figure 1 is clarified underneath.

B. *Input Image*

C. The initial step of tag identification framework is to choose an info vehicle picture. This picture contains License plate of vehicle. After the choice of the picture, preprocessing of the picture is performed

D. *Preprocessing of Image*

This is the second step of tag acknowledgment framework. Preprocessing is critical for the great execution of character division.

Preprocessing consists of:

- Resizing image
- Rgb to gray conversion
- Noise Removal(Median Filter)

Preprocessing of a picture signifies "planning" of the specimen/picture to acquaint it with a calculation for determined errand like acknowledgment of picture, highlight extraction and so on.

*Brightness and Intensity of Image*

After preprocessing of the image we adjust the brightness and intensity of the image. To scale the intensity in Matlab we use imadjust() function. Intensity of the image is the average of the intensities of all pixels in image. Brightness can be increased or decreased by simple addition or subtraction, to the image matrix.

A. *Fill Holes in the Binary Image*

A typical utilization of the surge fill operation is to fill "openings" in picture. Gaps fill in the double picture are performed in light of representation of forefront items in the picture. In our framework we utilize imfill() capacity to fill the openings in the parallel picture

B. *Display Registration Number in the Text Box*

After the filling of openings in the picture we get a number from the image. This number is shown in the content box. This is the enlistment number of the vehicle.

Local database

We make a nearby database which contains the data of vehicle proprietor. At the point when enlistment number is acquire than our framework contrasted this registrationon number with the database. At the point when match is found in the database than every one of the subtle elements of the vehicle proprietor is acquired.

C. *Pollution Fine*

This System basically chips away at the contamination fine control. In this if contamination check date is lapsed than fine is forced on the vehicle's proprietor. This fine is force by sending the mail to the proprietor of the vehicle and when contamination check is not terminated than no mail is sent to the vehicle proprietor and no fine is forced on the proprietor.

IV METHODOLOGIES

The primary objective of this system is to concentrate on the restriction and acknowledgment of the numbers present in tag of a vehicle. We find the tag part of the vehicle from each pictures to begin with, and afterward enlist them to a reference picture by layout coordinating in same accuracy. We utilize a basic formats coordinating to perceive the letters in the evaluated prepared pictures. Prior to the handling of two proposed stage for the arrangement, information pictures need to pre-procedure of exact yield. The accompanying areas portray the procedure of these techniques regulated. This paper, taking into account the picture preparing techniques, gives the picture pretreatment, for the position of tag all in all picture of vehicle.

To make the vehicle tag acknowledgment numerous little stages must actualize, for example, : picture procurement, preprocessing of picture, confinement of tag, division of characters, acknowledgment of tag characters.

A. *Image Pre-processing:*

Picture pre-handling essentially expand the unwavering quality of an optical examination for the particular element discovery. In the tag, we for the most part utilize Resizing of picture and after that believer into grayscale picture. To resize the picture we are utilizing imresize() in this width of the picture is 400 and stature of the picture is balanced as needs be to keep up the perspective proportion. After that we utilize rgb2gray() to change over the resized picture into dark scale picture.

B. *License Plate localization*

In tag confinement, first we should need to discover the area of the number plate in entire vehicle picture for recognizable proof of enrollment number. To execute the system from information picture, to the yield characters as in editable structure, limitation process takes imperative part. For the confinement fundamentally we utilize middle channel to sift through the clamor in the picture in this commotion sort is pepper and salt. Expansion is performed after the clamor expulsion from the picture then we find the tag in the info picture.
C. Character Segmentation

Character segmentation is a vital part of the License Plate Recognition (LPR) system. There are numerous challenges in this process, which are the nearness of the license plate area; characters are not appropriately adjusted and so forth. In the event that the characters in the tag are in impeccable condition, that is, characters are adequately isolated or unbroken; character segmentation might be refined specifically from vertical and flat division. In this it recognizes the even lines in the picture with a pixel value of zero. After that the picture is changed over into dim scale picture and afterward we just use "for" circle to distinguish the bit of the picture that had associated objects with pixel estimation of zero.

D. Character Recognition

Character recognition is a procedure for the programmed transformation of printed characters into editable content. After character segmentation of the tag system need to bear on character acknowledgment for every segregated character. The example coordinating procedure is a reasonable system for the acknowledgment of single characters. This technique is utilized as a part of paired pictures, appropriately manufactured layouts and it likewise got great results for dark level pictures. In this character acknowledgment we modify the brilliance and force of the picture. After that we fill the openings present in the twofold picture and at last we utilize layout coordinating procedure to perceive the characters from the picture. At last the yield is shown in the content box that is enrollment number of the vehicle.

Pollution Fine Controller and Driver Information Fetcher

After the character recognition we checked the owner name, city, address, and registration number of the vehicle, contact number. After recognition of the vehicle registration number we compare the registration number to the local database. If the match is found then we get the detail of the vehicle owner. Then we compare the registration number to pollution control table then we get the expiry date of the pollution check of the vehicle owner. If current date is in the valid range then all OK, otherwise the fine is to be calculated and the fine can be send on manual basis or automatically on email and the details will be send by fetching the details required from the local database record using the registration number. Structure of the database of the local database will look like:

<table>
<thead>
<tr>
<th>Vehi cle number</th>
<th>Name</th>
<th>address</th>
<th>City</th>
<th>Phone</th>
<th>E-mail Id</th>
<th>Date of regi.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RJ14CJ5252</td>
<td>Kris han Pal</td>
<td>34 Vik as</td>
<td>Jai pur</td>
<td>98340 40222</td>
<td><a href="mailto:garg.shivan41@gmail.com">garg.shivan41@gmail.com</a></td>
<td>12/16/2013</td>
</tr>
</tbody>
</table>

Fig.2. Structure of the database of the local database

Structure of the database of the pollution control will look like

<table>
<thead>
<tr>
<th>Registration number</th>
<th>Date of pollution check</th>
<th>Expiry date</th>
</tr>
</thead>
<tbody>
<tr>
<td>RJ14CJ5252</td>
<td>6/18/2015</td>
<td>12/18/2015</td>
</tr>
</tbody>
</table>

Fig.3. Structure of the database of the pollution control

The fundamental point of this work is to present more effective method for contamination control testing for vehicle by utilizing character division and acknowledgment. In our system web cam would be set which would catch the picture of the vehicle's number plate. The caught picture by the camera would be changed over into dim scale picture and afterward we just use "for" circle to distinguish the bit of the picture that had associated objects with pixel estimation of zero.

V. EXPERIMENT RESULTS

The proposed system was assessed by taking vehicle info picture physically and the outcome got appeared in taking after strides
- Input image
- Resize the input image
- Convert image into gray scale
- Apply median filter to remove the noise
- Scale brightness and intensity of the image
- Fill holes in the binary image
- Display the license plate number
- Compare with database
- Display the Vehicle owner detail
- If pollution check is expired then mail is send to vehicle owner.

Fig.4. Input image
Fig.5. Resize Input Image
Fig.6. Grayscale Conversion
Fig.7. scale Brightness and intensity
VI. CONCLUSION

The primary point of this work is to enhance security of enrolled number plate in India. This system is utilized for discover contamination check of vehicle and concentrate the driver data. In this proposed work we can send the mail to the proprietor of the vehicle in regards to fine forced, if contamination check of the vehicle is lapsed. In this proposed work we can likewise confine the vehicles which are 10 year old or over 10 year old. The test results demonstrate that this methodology can accomplish exceptional and powerful identification execution in contamination fine controller and vehicle confinement range. In future on some mind boggling pictures we can likewise apply some scientific devices to accelerate the procedure and enhance the outcome.

VII. REFERENCES


Conference on Electro/Information Technology (EIT), Mankato, MN, pp. 1-5, 2011.


