

## Toll Gate Vehicle Monitoring System – A Preview

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**Abstract—** Advance in technology, there is a different aspect of designing and allotting number plates to the vehicle of their country. For the several respective regular administrative tasks, the license number plate is used by various government offices for purposes of tracking of number plates, for the analysis of theft case, for the collection and management of parking vehicles. The unique number is given for each motorized vehicle in India. Vehicles play a vital role because of population growth. For various security purposes vehicle number has to be stored. The number plate is recognized to extract number of the plate faster. The character recognition technique is used to recognize numbers and character from number plate. Then recognized the number and character is stored in a cloud storage system as and used for further needs.

**Key words-** Character Recognition; Cloud Storage

### I. INTRODUCTION

The main objective of this paper is to researchers providing existing ALPR research by the attributes they used for future research. Implement a security system based on number plate validation, store it in a database. The extraction of the number plate, to recognize vehicles by automatically reading their number plates, Automatic License Plate Recognition (ALPR) employs character recognition and image processing technology. The unique number is given for each motorized vehicles in India. These numbers are designated to the vehicles by district-level Regional Transport Office (RTO). For computers, it is an extremely trouble task to read the numbers. Many of the problems like- illumination, blueness, background color, foreground color, etc. Vehicles play a vital role because of population growth. Reading the number plates of a car many constraints are faced with the - presence of noise, blur the image, uneven illumination, dim lighting and foggy scenarios. Vehicle number plate recognition is an important research topic. Some of the functions of VNPR in the traffic monitoring system are – controlling of traffic volume, generating tickets for vehicles with no vehicle tracking, human control, vehicle security, vehicle policing. ALPR method is used for recognition of accuracy and processing speed. This recognized number is stored in the cloud storage system and used whenever it is needed.

### II. NUMBER PLATE IDENTIFICATION

#### A. Image Acquisition

Different approaches can be used to input an image to the system- digital camera or analog camera can be used. Taking input with the help of digital cameras, or by direct digital photos because digital technology has its own benefits [1].

#### B. License Plate Recognition

Capturing the image has the license plate that is also enclosed by the background of the vehicle body. The area extraction of the number plate is done my extraction method. Also, determine the region containing the license plate.

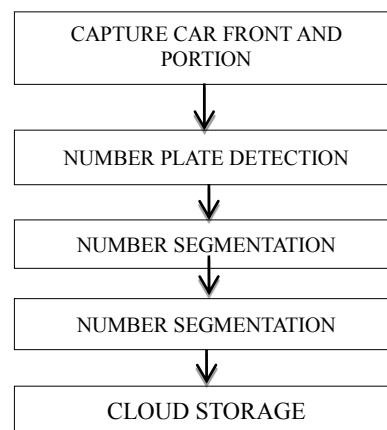


Figure 1. License number Identification and Storage

### C. Character Segmentation

This step is used to identify each fragmented particle and segment the license plate. In the license plate recognition algorithm, it plays the major role [2]. The factors that cause the character segmentation task difficult area-image noise, space mark, rivet, plate frame, and plate rotation and illumination variance. Conversion to grey-scale and binarization requires segmentation pre-processing.

### D. License Plate number Recognize

Location, Quantity, Size, Color, Font, Occlusion, Inclination is the main challenge for the detection and recognition of license plates is the variety found in plate types or the environment.

## III. ALGORITHM FOR CHARACTER RECOGNITION

Character segmented license plate is passed to do with the eye or seeing the person in a work wide approval of one's work algorithm designed by us which uses a matrix great change of the bit of picture value [3]. Thus sending name for different filtration and extraction techniques which uncommonly takes to be the same three persons in a wok.

OCR algorithm comes with the License plate in wording form and size. Which is later stored in a text file, thus reducing the space in the memory storage algorithm uses a 3-4 MB database of 36 files (images). These images will be colored images, but only of one color say red. So a pixel value where there is the character is 255, 0, 0. Where space is empty the value is 255,255,255.

Then the character obtained when character segmentation square measure mapped with the characters within the information one by one [4]. Then this matrix is compared with the sample pictures in information one by one. If the character matches, then the worth of the character is coming back. The matrix used will be preferably 20x20. For the mapping between sample image and actual character; we are using green intensity pixels. Because their worth is zero at each purpose whenever there's character and 255 whenever there's white background. We tend to might have used blue intensity additionally.

This rule can so presumably be ready to observe similar characters like eight and B as a result of the share of matching of 1 character are going to be the opposite. It is assumed that if any image is matched with 70-80% pixel intensities we assume that the character matches [5]. Poor lighting and low contrast due to overexposure, reflection or shadows problem can be reduced using this technique.

Then a matrix is refreshed and a new character gets copied in the matrix. The process continues until all the characters

in license plate get matched. The above research work implementation has used a fast algorithm for recognizing a number plate for toll control application. The authors have designed an AVR based system that has validated a number plate and developed a user interactive ALPR system with validation using the database [6].

## IV. CONCLUSION

In general, an ALPR system is chiefly of four processing stages. In the image acquisition stage, while choosing the ALPR system camera some points have to be considered such as the resolution of the camera and its shutter speed. In the stage of license plate extraction, extraction of the license plate is done based on some features such as the color, the boundary, or the presence of the characters. On the license plate segmentation stage, the extraction of characters is done by projecting their color information, by labeling the characters, or by matching the positions of characters with the template. In the final step, the recognition of characters in the character recognition stage is done by template matching technique, or by classifiers such as neural networks and fuzzy classifiers. These number plate numbers are stored in the database and maintained for many purposes. Putting into effect of number plate based control system which can be put to use and working well instrumented on greatly sized scale with holes the software 1 on a small but powerful system like Raspberry Pi, it is a credit card sized computer system having its own processor, VGA output, memory (SD card), USB input etc., running on LINUX platform. It can run high-level languages like Python, OpenCV and it is very capable of implementing computer vision algorithm.

## REFERENCES

- [1] Kerav Shah, Gourav Inani, Darshan Rupareliya, Rupesh Bagwe and Bharathi H, "RFID Based Toll Automation System", International Journal of Computer Sciences and Engineering, Vol.4(4), pp.51-54, April 2016.
- [2] Sagar Badgujar, Amol Mahalpure, Priyaka Satam, Dipalee Thakar, Swati jaiswal, "Real time number plate recognition and tracking vehicle system" SSRG International Journal of Computer Science and Engineering ,vol.2(12), Dec 2015
- [3] N.Nagaraju, M.S.Kiruthika, R.Gowthami, S.Mala, K.Pavithra, "Auto Payment of Tolls with Tracking of Theft Vehicles & Proximity Detection for Avoiding Accidents", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol.3(4), April 2014
- [4] Dr. P.K.Suri, Dr. Ekta Walia, Er. Amit Verma, "Vehicle Number Plate Detection using Sobel Edge Detection Technique", International Journal of Computer Science and Technology, Vol.1(2), Dec 2010.
- [5] Amol A. Chapate, D.D. Nawgaje, "Electronic Toll Collection System Based on ARM", International Journal of Science, Engineering and Technology Research, Vol.4(1), Jan 2015.

- [6] Devika Mhatre, "Electronic Toll Collection Using Barcode Reader", International Journal of Advanced Research in Computer Science and Software Engineering, Vol.5(2), pp.124-127, Feb2015.
- [7] AungMyint Win,et.al, "RFID based automated toll plaza system", International Journal of Scientific and Research Publications, Vol.4(6),pp.1-7 June 2014.

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