A Recent Study on Indian Number Plate Recognition Using Optical Character Recognition

[1]Ashwini Mhetre,[2]Dhanashri Deosarkar,[3]Priya Devkate,[4]Prof. S.S.Pattanaik
[1][2][3][4]Department of Computer Engineering,JSPM's Rajarshi Shahu College Engineering, Pune, India

Abstract — **With the development of vehicles and the increasing number of cars in modern society, people pay more and more attention to the vehicle license plate recognition system. Vehicle license plate recognition is divided into three parts: license positioning, character segmentation and character recognition. One of the method is Automatic Number Plate Recognition (ANPR) is a real time embedded system which automatically recognizes the license number of vehicles. In this paper, with the help of this technique the task of recognizing number plate for Indian conditions is considered, where number plate standards are rarely followed. The propose architecture uses integration of algorithms like: 'Feature-based number plate Localization' for locating the number plate, 'Image Scissoring' for character segmentation and statistical feature extraction for character recognition; which are specifically designed for Indian number plates. As per the Indian number plate patterns by using this method and by implementing these algorithms in Java we can achieve to recognize one or two line number plate almost perfectly. And due to use of higher level language in this paper we can achieve more flexibility and security in implementing those algorithms.**

Key words- **Automatic license plate recognition (ALPR), automatic number plate recognition (ANPR), car plate recognition (CPR), and optical character recognition (OCR) for cars.**

I. INTRODUCTION

The existing methods and systems for optical character recognition provide high reliability of the recognition of texts with high and medium print quality. It contains very small type of errors which cannot be recognised by human being. However such systems are not always able to cope with the task of characters recognition in industrial systems, for example, while recognising serial numbers in products, packing etc. Automatic number plate recognition is a mass surveillance method that uses optical character recognition on images to read vehicle registration plates. They can use existing closed-circuit television or road-rule enforcement cameras, or ones specifically designed for the task. They are used by various police forces and as a method of electronic toll collection on pay and cataloguing the movements of traffic or individuals. ANPR can be used to store the images captured by the cameras as well as the text from the license plate, with some configurable to store a photograph of the driver. Systems commonly use infrared lighting to allow the camera to take the picture at any time of the day. ANPR technology tends to be region-specific, owing to plate variation from place to place. By considering these techniques and technology we have

decided to purpose a system which can be useful for visitor to recognize buses by their name board.

I. PREVIOUSLY WORK DONE

In paper [4] which is on An Image Segmentation Algorithm in Image Processing Based on Threshold Segmentation it is said that Image segmentation is a key technology in image processing, and threshold segmentation is one of the methods used frequently. Aimed at that only one threshold or several thresholds are set in traditional threshold-based segmentation algorithm, it is difficult to extract the complex information in an image; a new segmentation algorithm that each pixel in the image has its own threshold is proposed. In this algorithm, the threshold of a pixel in an image is estimated by calculating the mean of the grayscale values of its neighbor pixels, and the square variance of the grayscale values of the neighbor pixels are also calculated as an additional judge condition, so that the result of the proposed algorithm is the edge of the image. In fact the proposed algorithm is equal to an edge detector in image processing. Experimental results demonstrate that the proposed algorithm could produce precise image edge, while it is reasonable to estimate the threshold of a pixel through the statistical

information of its neighbor pixels. By studying this paper we get the concept of Segmentation Algorithm

Also in [5] the maximum entropy-based image segmentation approach is proposed to segment a gray-scale face image. The approach performs with the Maximum Entropy Thresholding value (MET) of 2D image. A target of experiment is reported face image segmentation that uses still face image from BioID database. The results of this method are clearly demonstrating the segmentation that performs better than other work on the same original image. Furthermore, the value of MET method gets threshold equal 141 that are both similar to the threshold segmentation with Centre of mass method (threshold = 139) and Iterative method (threshold = 140), but different from Otsu's method. It indicates a small sufficient step that can be used for face segmentation, detection, and extraction which are the next steps of the entire face recognition system. From this we get the concept of Segmentation Algorithm maximum Entropy.

II. SYSTEM ARCHITECTURE AND ALGORITHM USED

Fig.1. shows the architecture diagram of the proposed system.
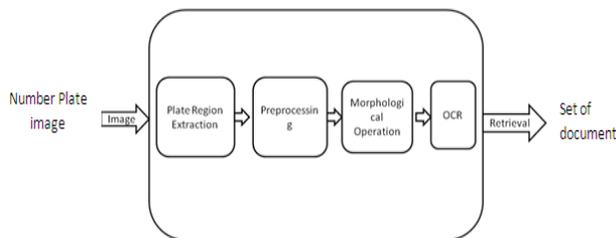

Fig.1. System Architecture

The proposed system accepts number plate image as input and a set of documents is retrieved from the system in form of output. The captured image goes through some intermediate process to get efficient output. The main idea of the proposed system is to extract a license plate number from given image. This process of automatic license plate recognition is composed of four stages. The stages are as follows:

1] Image Acquisition
2] License Plate Region Extraction
3] License Plate Segmentation
4] Optical Character Recognition (OCR)

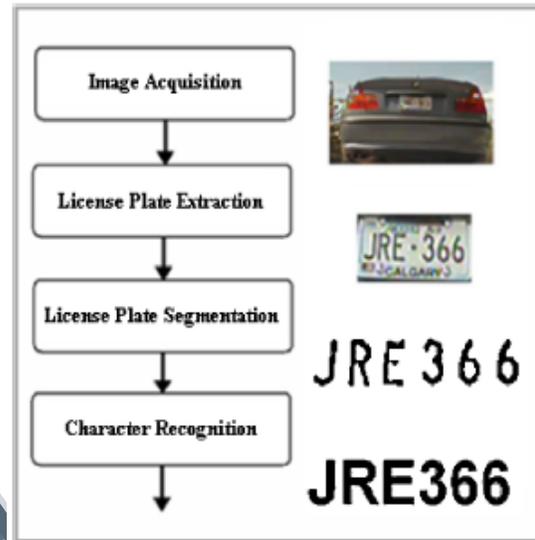Fig.2. shows the four stages of an Automated License Plate Recognition (ALPR) system.

Fig.2. Four Stages of ALPR System

1) Image Acquisition

In first stage, the license plate image is acquired using a camera. The parameters of the camera, such as the type of camera, camera resolution, orientation, and light, have to be considered.

2) License Plate Region Extraction

The second stage is to extract the license plate from the image based on some features. In the proposed system boundary based extraction is performed. The Boundary-based extraction technique uses Hough transform (HT)[9]. It detects straight lines in the image to locate the license plate. The Hough transform has the advantage of detecting straight lines with up to 30° inclination.

3) License Plate Segmentation

In this stage, the license plate is segmented and the characters are extracted by projecting their color information, labeling them, or matching their positions with templates. In this stage, binarization is performed. Binarization is usually performed in the preprocessing stage of different document image processing related applications such as optical character recognition (OCR) and document image retrieval. It converts a gray-scale document image into a binary document image and accordingly facilitates the ensuing tasks such as document skew estimation and document layout analysis.

4) Optical Character Recognition (OCR)

In this stage, the extracted characters are recognized and the output is the license plate number. Character recognition in ALPR systems may have some difficulties. Due to the camera zoom factor, the extracted characters do not have the same size and the same thickness. Resizing the characters into one size before recognition helps overcome this problem.

CONCLUSION

Automatic License Plate Recognition (ALPR) System will process on images of number plate of cars and find out the details of car and owner. It will help police traffics to understand the detail of owner and car details and solve the problem of carry document This system consists of modules i.e. plate extraction, processing, morphological operations and OCR for character recognition. We have used edge and color detection algorithm for extraction, maximum entropy for binaries, morphological operation for noise removal and OCR for character recognition.

REFERENCES

[1] G. Liu, Z. Ma, Z. Du, and C. Wen, "The calculation method of road travel time based on license plate recognition technology," in Proc. Adv.Inform. Tech. Educ. Commun. Comput. Inform. Sci., 2011.

[2] Y.-C. Chiou, L. W. Lan, C.-M. Tseng, and C.-C. Fan, "Optimal locations of license plate recognition to enhance the origin-destination matrix estimation," in Proc. Eastern Asia Soc. Transp. Stu., 2011.

[3] S. Kranthi, K. Pranathi, and A. Srisaila, "Automatic number plate recognition," Int. J. Adv. Tech., 2011.

[4] C.-N. E. Anagnostopoulos, I. E. Anagnostopoulos, I. D. Psoroulas, V. Loumos, and E. Kayafas, "License plate recognition from still images and video sequences: A survey," IEEE Trans. Intell. Transp. Syst., Sep. 2008.

[5] C. Nelson Kennedy Babu and K. Nallaperumal, "An efficient geometric feature based license plate localization and recognition," Int. J. Imaging Sci. Eng., 2008.

[6] F. Faradji, A. H. Rezaie, and M. Ziaratban, "A morphological-based license plate location," in Proc. IEEE Int. Conf. Image Process., vol. Sep.–Oct. 2007

[7] D. Zheng, Y. Zhao, and J. Wang, "An efficient method of license plate location," Pattern Recognit. Lett., 2005.

[8] K. Kanayama, Y. Fujikawa, K. Fujimoto, and M. Horino, "Development of vehicle-license number recognition system using real-time image processing and its application to travel-time measurement," in Proc. IEEE Veh. Tech. Conf., May 1991.

[9] V. Kamat and S. Ganesan, "An efficient implementation of the Hough transform for detecting vehicle license plates using DSPs," Real-Time Tech. Applicat. Symp., 1995