International Journal of Electronics Engineering (ISSN: 0973-7383)
Volume 11 • Issue 1 pp. 806-811 Jan 2019-June 2019 www.csjournals.com

Automatic Number Plate Recognition system on vehicle images using Optical Character Recognition Technique

[1]Rucha S. Dabholkar ,[2]Prof. S.V. Phakade
[1] M.Tech. student , [2] Associate Professor
[1,2] Deptt. of Electronics and Tele-Communication Engg., [1,2] P.V.P.I.T., Budhgoan, Sangli, India

Abstract: At the very outsight, I shall like topoint out that this is pre- review of my final project. Number plate extraction is the key step in Automatic Number Plate Recognition (ANPR) system. Accuracy of extraction plays vital role in the system. In this extraction, we are supposed to extract vehicle number plate from preprocessed image. Using image segmentation method, a number plate can be segmented. There are various image segmentation methods available. In most of the methods image binarization method is used. In this method, various colour image is converted into grayscale image. We can apply different Image segmentation methods as per the requirements of the application. Next step used optical character recognition technique. This Optical Character Recognition (OCR) technique can give identification of characters which is useful in machine processing.
Keywords: Scanned images; Number Plate Recognition; Segmentation; Template matching; Optical Character Recognition.

I. INTRODUCTION

Automatic recognition of license plate is an important stage in automatic parking systems as well as intelligent traffic systems. For this purpose, many methods have been developed for the construction of license plate recognition system. This system is challenging because it requires many computer vision problems in which includes character recognition and object detection. Automatic number Plate Recognition (ANPR) system is main for many number of applications like automated tolls, law enforcement, automated parking system, services theft monitoring and access control. Number Plate Recognition (NPR) System is used to control access to parking system and automatically to apply toll charges.

Automatic Number Plate Recognition (ANPR) system is a real time embedded system in which automatically recognize number plate of any vehicles. This system captures the vehicle images and recognize their license number. Automatic Number Plate Recognition (ANPR) system has separated in three major regions such as vehicle number plate extraction, character segmentation and optical character recognition. In number plate extraction, vehicle number plate is detected. The detected number plate is processed to remove the noise and the result is proceed to the character segmentation. In this bit, character segmentation is carried out individually from the extracted number plate. These characters are normalized and proceed to an optical character recognition algorithm. OCR algorithm improve the speed of input operation, decrease some possible human error, fast retrieval and other file manipulations. Accuracy, flexibility and speed are the main features of good OCR system. Optical Character Recognition (OCR) technique is to convert printed document into ASCII character that is encoded text. These character are recognized using template matching. This result must be in the form of string character.

II. LITERATURE REVIEW

Muhammad Tahir Qadri and Muhammad Asif [2] programmed vehicle distinguishing proof framework. The objective of this paper is that to design an efficient automatic vehicle identification system by using vehicle number plate. The system is implemented on the entrance of toll, parking system for security purpose. The system had salient features like detecting vehicle and grab the vehicle image.Then this region is extracted using the image segmentation method. After that, Optical Character Recognition (OCR) algorithm is used for the character recognition on the extracted vehicle number plate. The resulting data is in the form of string character. ThanongsakSirithinaphong and KosinChamnongthai [1] proposed the recognition of car license plate for automatic parking system. Advantage of this system was accuracy and well resistant to variation in environment. This paper

discussed how to recognize the character on authorized number plate by neural networks. The experimental result of this paper is car images with the prototype of parking system show the performance of car license plate extraction and the recognition rate also. Hakob et.al. [5] discussed Automatic number plate recognition system. In this paper, to identify software part of the number plate and to recognize the number plate from video images is presented. Also used Hough transform for line detection, digital filter to remove noise, chain code and Optical Character Recognition (OCR) algorithm. Vandini et.al. [6] have discussed in this paper that Automatic Number Plate Recognition (ANPR) system using Optical Character Recognition (OCR) and template matching on yellow colour license plate. After pre-processing and extracting of vehicle number plate used different image segmentation method. The characters on vehicle number plate are segmented on the basis of sobel edge. Then used Optical Character Recognition (OCR) algorithm. After this algorithm, one more process is done. This vehicle number is authorized or not authorized. If the number is not authorized then this number is to send to the administrator using electronic mail. KetanShevale [4] described the smart vehicle screening system and also presented automatic vehicle number plate recognition for toll booth application. The license plate recognition system can be used in many application such as entrance admission, security, parking control, speed control, road traffic.

III. METHODOLOGY AND PROPOSED WORK

SOFTWARE MODEL

The main and the most important portion of this system is the software model. The software model use number of image processing techniques which are implemented in MATLAB. The ANPR system can be implemented as follows:
In this paper, all images are taken from IJIREEICE journal paper to understand output of each process clearly. Before pre-processing process, to capture the image of vehicle for identifying number plate of vehicles using digital camera shows in fig.1. For this paper, to require data collection from internet or other facility.

Fig.1- Image captured using digital camera

1. **Pre-processing :**
Pre-processing is a standard name for operations with images at the lowest level of abstraction. The fundamental requirement of system is clear image with appropriate sharpness, brightness and noiseless to achieve this pre-processing is required. We can define pre-processing process as removal of unwanted things from raw database.
Digital image processing is used to perform image processing on digital images. As a subcategory, digital image processing has many advantages over analog image processing. It allows a much wider range of algorithms to be affected to the input data and can avoid problems such as the enlargement of noise and signal distortion during digital image processing.
Pre-processing is used to convert original image into gray-scale image. Following figures are shown for understanding pre-processing process.

International Journal of Electronics Engineering (ISSN: 0973-7383)
Volume 11 • Issue 1 pp. 806-811 Jan 2019-June 2019 www.csjournals.com

Fig.2- original image

Fig.3- Gray scale image

2. Plate region extraction :

Number plate extraction is fundamental in ANPR system because all others steps namely segmentation, optical character recognition depend on this. The extraction of number plate is very difficult and involves many parameters which influences the accuracy of ANPR. Fig 4 illustrates extracted number plate from gray scale image.

Fig.4- Extracted number plate

3. Character segmentation :

After extraction, segmentation is carried out. Image compression or object recognition as a whole image is not possible. Hence segmentation process is adopted. Extracted image can not be used as it is. It need to be divided into small regions. This is called segmentation process. Extracted image is segmented to achieve required data by segregating characters individually. Several techniques are available with the help the images break into several parts based on certain image features like pixel intensity value, colour, texture, suitable segmentation algorithm will be applied to get desired region of interest.

From extracted number plate, number plate segmented using bounding box method shown in fig 5.

International Journal of Electronics Engineering (ISSN: 0973-7383)
Volume 11 • Issue 1 pp. 806-811 Jan 2019-June 2019 www.csjournals.com

Fig.5

Fig.6- Output of segmentation proce

4. Character recognition :

After segmentation process, Optical Character Recognition (OCR) algorithm converts image in printed form, handwritten document into machine encoded text information such as ASCII. This OCR technique is widely used. This performance is directly depend on the quality of input documents.

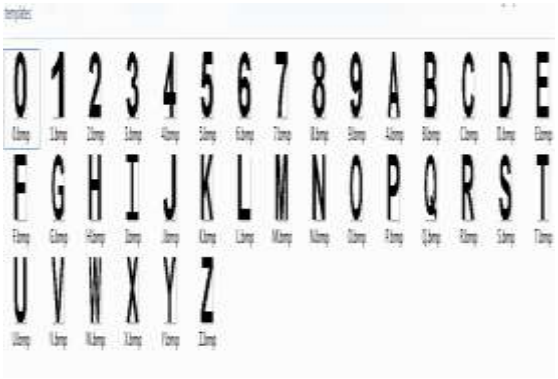


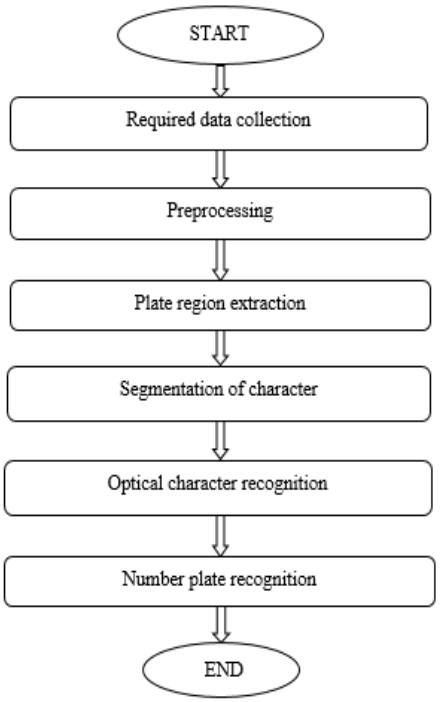
Fig.7- Template matching chart

5. Number plate recognition :

The automatic number plate recognition with OCR will work to convert the data which will make possible to built-up database network from extracted database. Commercial organizations, large scale industry can use automatic number plate recognition for their own business and effective time management using OCR tracking.The final output of number plate recognition system is shown in below fig 8.

Fig.8- Final output

Flow chart



IV. CONCLUSION

In this paper, we are presenting the automatic number plate recognition system using vehicle license plate. The system use series of image processing technique which are implemented in matlab and it's performance is tested on real images. We will also check and evaluate the accuracy of optical character recognition technique using template matching which affects the accuracy of number plate recognition.

References

[1] ThanongsakSirithinaphong and KosinChamnongthai, "The Recognition of Car License Plate for Automatic Parking System", Fifth International Symposium on Signal Processing And its Applications, ISSPA '99, Brisbane, Australia, 22-25 August, 1999.
[2] Muhammad Tahir Qadri and Muhammad Asif," Automatic Number Plate Recognition System for Vehicle Identification using Optical Character Recognition",2009 International Conference on Education Technology and Computer.
[3] Kartikeya Jain, Tanupriya Choudhury and NirbhayKashyap,"Smart Vehicle Identification System using OCR", 3rd IEEE International Conference on "Computational Intelligence and Communication Technology" (IEEE-CICT 2017).
[4] Ketan S. Shevale," Automated License Plate Recognition for Toll Booth Application",Int. Journal of Engineering Research and Applications,ISSN : 2248-9622, Vol. 4, Issue10(Part - 5), October 2014, pp.72-76.

[5] HakobSarukhanyan, SourenAlaverdyan, and GrigorPetrosyan," Automatic Number Plate Recognition System", Institute for Informatics and Automation Problems of NASRA, Yerevan, Armenia.
[6] Vandini Sharma**,** Prakash C. Mathpal, AkankshaKaushik,"Automatic license plate recognition using optical character recognition and template matching on yellow color license plate",International Journal of Innovative Research in Science, Engineering and Technology,ISSN: 2319-8753 Vol. 3, Issue 5, May 2014.
[7] Er. Kavneet Kaur, Vijay Kumar Banga,"Number Plate Recognition using OCR Technique", International Journal of Research in Engineering and Technology, eISSN: 2319-1163, pISSN: 2321-7308, Volume: 02 Issue: 09 , Sep-2013.
[8] S. R. Aher, Prof. N. D. Kapale**,"**Automatic Number Plate Recognition System forVehicle Identification using Optical Character Recognition**",** International Research Journal of Engineering and Technology (IRJET), e-ISSN:2395-005, p-ISSN: 2395-0072,Volume: 04 Issue: 06, June -2017.