



INTERNATIONAL JOURNAL FOR ENGINEERING APPLICATIONS AND TECHNOLOGY

AUTOMATIC NUMBER PLATE RECOGNIZATION SYSTEM

Archana patil¹, M.Azran Akhtar², Mrunal Gade³, Umesh Pardhi⁴, Ass. Prof. Chetan Dhamande⁵

IVth Year BE(CSE Department), JDIET, Yavatmal-, ap688239@gmail.com

IVth Year BE(CSE Department), JDIET, Yavatmal-, azran.shaikh44@gmail.com

IVth Year BE(CSE Department), JDIET, Yavatmal-, mrungalgade1508@gmail.com

IVth Year BE(CSE Department), JDIET, Yavatmal-, umeshpardhi12345@gmail.com

Assistant Professor, JDIET, (CSE Department), Yavatmal-, chetan_dhamande@jdi.ac.in

Abstract

Auto Recognition of License Plate is a kind of image processing technology for recognizing the number plate information from images or videos. The observed plate images are normally in low resolution and suffer severe loss of edge data, which cast, incredible test to existing vehicle number plate detection and recognition patterns. The process of Auto recognition of License plate requires a high level of precision, when there are various vehicles going in a brief span and number plate abstraction is a number is a difficult task, basically because of number arrangement, and impact of environmental work. This step influences the accuracy of character separation and acknowledgment framework. This paper introduces a algorithm for Auto recognition of license plate system utilizing various approaches. Auto recognition of license plate method comprises of three segments: Character segmentation, Optical character recognition and template matching. The proposed framework presents the automatic vehicle number plate identification system utilizing a vehicle number plate extraction. Another strategy utilizing Gabor filtering for character recognition in gray scale image is proposed in this paper. Components are separated directly from gray-scale character images by Gabor filters which are exceptionally intended for measurable data of character structures.

Index Terms: Automatic Number plate Recognizatuin (ANPR), Automatic Licence Plate Recognition (ALPR), Optical Charactor Recognition (OCL).

1. INTRODUCTION

Nowadays the use of vehicles play an important role in transportation because of population growth. Recognizing the vehicles, in order to control them, is needed. Vehicles can be easily controlled using the vehicle registration plate as vehicle number plates are unique for every vehicle. Because manually recording the vehicles is very time consuming and not efficient, automation process is needed in order to recognize the vehicle plates. Automatic Number Plate Recognition (ANPR) is an essential tool, in our days, used to provide traffic, security, parking, speed control. In many areas, the traffic is verified by the devices that implemented ANPR. It is used in parks, on highways, by police, in customs and private companies. With just one picture it is possible to detect any data about the driver. The aim of this paper is to develop an algorithm for license plate recognition, particularly for an auto service. This is achieved using an automatic number plate recognition library

OpenALPR.

This is a system that implements the registration number for several states, in Europe and other continents. In our case the application configurations are made for the countries of Europe. In order to recognize a number plate from an image, this image is passed through an algorithm for character extraction that uses Optical Character Recognition (OCR). After the segmentation of the characters is complete, these are passed to an OCR algorithm and the final format has to correspond with the data from the database of the application. The elements that must be considered are maximum recognition accuracy, clear recognition response and getting as many good responses from the recognition using many types of license plates. Also different scales, resolutions, illumination and light variations has also to be considered. Our project main objectives are to acquire in a successful way

car images, extract the license number plate from the acquired image, and recognize the license plate characters by matching

them with prerequired information.

2.RELATED WORKS

S. Ramalingam, M. Rhead, and R. Gurney [1] proposed Automatic Number Plate Recognition (ANPR) frameworks which utilize Optical Character Recognition (OCR) to help decide the individual characters of the number plate. They take a shot at creating key informational indexes through a reenactment procedure that will produce auto number plate pictures. As an initial step, such plates will indicate fluctuation in character dispersing for surveying ANPR frameworks which will exhibit the standards for benchmarking. This framework maintains a strategic distance from the requirement for doing any asset escalated field trials by the Police Force.

Najeem Owamoyo [2] proposed Automatic Number acknowledgment for Nigerian vehicles. Number plate extraction is done utilizing Sobel edge location channel, morphological operations and associated segment examination. Character division is finished by associated part and vertical projection examination. Shan. Du, M.

Shehata, W. Badawy [3] describe an extensive study on existing (Automatic License Plate Recognition)ALPR Techniques by arranging them as indicated by the elements utilized as a part of each stage. Correlations of them in the terms of Pros, Cons, Recognition comes about, and Processing rates were tended to. Chitode J.S

[4] suggested that ANPR is consistent embedded system recognizes the characters particularly for the photo of tag. The proposed count relied on upon mix of morphological operation with domain criteria tests for vehicle number plate constraint. The character affirmation was capable with the guide of optical attractiveness by technique of Template Matching.

Norizam Sulaiman [5] introduced the advancement of programmed vehicle plate discovery framework in which subsequently pre preparing the hopeful plate is distinguished by methods for highlight extraction strategy, character division is finished by limit box and character acknowledgment is finished by template matching.

3.PROPOSED APPROACHFOR AUTOMATIC LICENSE

Literature presents many ANPR methods. The method we used uses OCR system in order to recognize the license number plate. The used system has as an input an image, and the output is a plate-number. The algorithm has eight phases showed in Fig.1. Fig.1

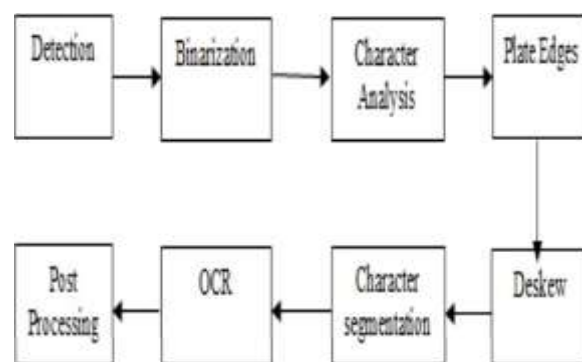


Fig 1 System architecture.

Detection

License plates have normally a rectangular shape. The Local binary patterns (LBP) algorithm is used in order to extract the number plate from the image. This algorithm classifies the texture and uses it along with the oriented gradient histogram (HOG), improving the detection performance of some data sets. The process calculates a histogram, which can be seen as a vector. The resulting vector is being processed. The algorithm searches for license plate regions, and then goes to the next phase.

A. Binarization : In this phase, multiple binary images for each plate region are created using the Sauvola method [6]. Although it has quite attractive advantages, the Sauvola method also has several disadvantages like lack of contrast objects, maintaining the texture of the text as it is found, manipulating large objects, interference with other objects.

B. Character Analysis : In this phase character-sized regions in the license plate region are found. The process begins with looking for small characters, then for larger characters. nothing is found, the region is thrown out, until a character is found.

C. Plate Edges : In this phase the precise top, bottom, left, right edges of the license plate are identified.

D. Deskw : In the phase the plate region is remapped to a standard according to the size and area of the registration number. In other words, it is a process that eliminates oblique zones of the image. Often, images are not necessarily perfect, in many cases the object being oriented in different ways. This process brings the text, that has to be recognized, vertically tilted.

E. Character Segmentation : In this phase all the characters, that make up the plate image, are isolated. For this, a vertical histogram is used. Also disconnected, small speckles and disqualifying character regions are removed in order to clean up the character boxes [7].

F. OCR : The algorithm uses OCR, where the input is the image, and the extracted data are the characters. These characters are compared to the data in the database. Due to the fact that the license plates have a fixed background, it is very easy to recognize the characters and is not necessary to consider other complex methods [8]. The schema for matching in the database is represented in Fig.2.

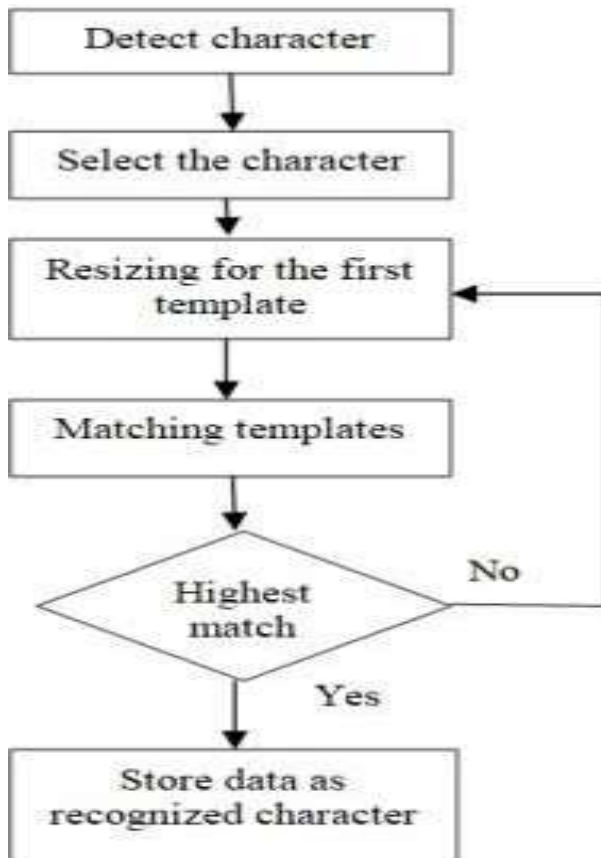


Fig. 2. Matching template schema.

Post Processing In this phase the best possible plate letter combinations are determined. If requested, region validation is handled. The pattern matching shows a result of the comparison between a regular expression and the license plate pattern [7].

4.CONCLUSION

In conclusion, this project presents the most common service in surveillance and data management. As described, the OCR service is the basis for identifying license plate numbers. ANPR has the role of constraining searches for the letters of the registration number using precise algorithms. It has been

observed that the demand of customers and users of these types of services has increased considerably. From simple users to the most important governmental organizations, they use a car service checkup. The auto service needs a database, an image and an application to run. OpenALPR came to help with an algorithm already implemented. The OpenALPR library proved to be ready and stable to use for this type of applications. The configuration was made for the European model, which means that the loaded image can have any registration number in the European countries. The test results were as good as expected.

5.Advantage:

Monitoring and Surveillance Automatic license plate recognition eliminates the tedious process of manually recording numbers. Especially when a car speeds by, it's almost impossible for a person to spot the exact registration number. However, automatic number plate recognition systems don't just record the numbers, but they do it in real-time, which gives a clear view of traffic insights as well. Some would say that this is a disadvantage, as the importance of manned surveillance is reduced. However, that's not completely true. The traffic personnel that used to stay on the streets can now work with all the information provided by the automatic license plate recognition software and be way more efficient. Keep in mind that the accuracy this system provides is very high

6.Disadvantage:

Extreme Weather Conditions In some cases, bad weather and hindrances can make automatic license plate recognition systems not completely effective. When this happens the security measures might be turned off and manned surveillance will be more needed **Privacy Concerns** The fact that images and records are kept and stored raises some privacy concerns. People are usually afraid that the records of someone's whereabouts in all these footages might be misused. It can become a subject of data thefts or people with all kinds of nefarious intentions. However, experts claim that LPR isn't infringing on anyone's privacy. The police have always been able to run registration plates, as they are issued to be used on public roadways. Furthermore, this system is much more objective than a person doing the job. It automatically checks every plate and no discrimination could be involved. The responsible agencies are taking these privacy concerns into consideration, to make sure that people feel safer on the road instead of at a bigger risk.

7. FUTURE WORK

Although critical advance of ANPR strategies has been made over the most recent couple of decades, there is still a great deal of work to be done since a strong framework ought to work successfully under an assortment of natural conditions and plate conditions. License plate acknowledgment can likewise be utilized for vehicle manufacturer and model acknowledgment. There are numerous other open issues for the future research. • Multi- plates ANPR systems • Car manufacturer and model recognition

8. REFERENCES

- [1] Ramalingam, M. Rhead, and R. Gurney “ Impact of character spacing on the performance of Automatic Number Plate Recognition (ANPR) systems through simulation”, Security Technology (ICCST), International Carnahan Conference on. IEEE, 2014.
- [2] Najeem Owamoyo, A. Alaba Fadele and Abimbola Abudu, “Number Plate Recognition for Nigerian Vehicles”, Academic Research International Journal (ARIJ), Vol.4, Issue.3, pp.48-55, 2013.
- [3] Shan. Du, Mohamed. Shehata, Wael. Badawy ,”Automatic License Plate Recognition(ALPR):A State- of –the-Art Review” IEEE Vol. 23, No.2, June 2013. [8] P. Anishiya, Prof. S. Mary Joans,” Number Plate Recognition for Indian Cars Using Morphological Dilation and Erosion with the Aid Of Ocrs.”International Conference on Information and Network Technology, Vol.4,2011.
- [4] Rupali Kate, Dr. Chitode J.S “Number Plate recognition using Segmentation” International journal of engineering & technology(IJERT) ISSN: 22780-0181. Vol.1 ISSUE 9- Nov2012.
- [5] Norizam Sulaiman, “Development of Automatic Vehicle Plate Detection System”, 3rd International Conference on System Engineering and Technology, pp.130-135, IEEE 2013.
- [6] Hadjadj Z., (2016) Improved Sauvola’s Algorithm for Document Image Binarization. In: Campilho A., Karray F. (eds) Image Analysis and Recognition. ICIAR 2016. Lecture Notes in Computer Science, vol 9730. Springer Cham.
- [7] Anon, (2017). OpenALPR Documentation. [online] Available: <http://doc.openalpr.com> [Accessed 7 Apr. 2019] [8] Nagy, George, Nartker, Thomas and V. Rice, Stephen, ”Optical character recognition: an illustrated guide to the frontier”, Proceedings of SPIE - The International Society for Optical Engineering, 3967, pp. 58-69, 1999