

International Journal of Computer Science and Mobile Computing

A Monthly Journal of Computer Science and Information Technology

ISSN 2320-088X

IJCSMC, Vol. 3, Issue. 9, September 2014, pg.492 – 495

RESEARCH ARTICLE



License Plate Recognition

Leelawati Gaddam¹, Sukanya H.Rane², Jayshri Kishan Baspure³, Priyanka B.Gagare⁴, Prof. Amol Baviskar⁵
¹⁻⁵Computer & Pune University, India

¹ leelawatigaddam14@gmail.com; ² sukanyahrane@gmail.com; ³ baspure.jayshri07@gmail.com;
⁴ priyankagorde8893@gmail.com; ⁵ amolbav@gmail.com

Abstract— With the growing speed of vehicles, license plate recognition has become a problem to identify the vehicles by detecting its number plate. Many researchers had proposed their various methods to recognize the vehicle number plate. In this system, the image of the license plate is broken down into pieces. These pieces are then used for analyzing the exact location of the characters on the plate. Then after, the OCR technique (optimal character recognition) is applied on the characters. The OCR methodology converts the characters into the text. The MSER technique is also used for cleaning up the actual image captured. Hence, the detected number plate is useful for maintaining the track of records in the form of database of the vehicles passing through the same toll repeatedly.

Keywords-: OCR, MSER, Licence plate detection, Template matching, Database

I. INTRODUCTION

For the many years, in the field of image processing the moving object detection location is done and its key technology is feature extraction and description. The MSER technique is used scale transformations, rotation transformation and transformation of the viewpoint. This technique reduces the robustness, repetition rate and the discrimination.

Firstly, the input image is pre-processed by using gray scaling and gray stretching and the finally the MSER technique (Maximally Stable External Region) license plate are choose. According to the pixel sum, the scale and length-width ratio of the license plate character region, Now, further using the constraints of the gray level jump and horizontal projection of license plate character region then next the same single-character regions are removed and the upper and lower borders of the license plate are determined. Finally, by using vertical projection the left and right borders of license plate are determined. OCR technique is used to convert the actual images of a handwritten or typewritten text into machine encrypted text. Further we store this in the particular database.

Generally, the system follows the following five steps image acquisition, image pre-processing, number plate localization, character segmentation and the finally the OCR (optimal character recognition) to recognize the individual character. This last step can be done with the help of database stored for each and every character. To get success in completing this goal a optimal character recognition technique method is used to implement system.

II. LITERATURE REVIEW

Guanghan Ning *et.al* tested the licensed plate on 200 image plates in China under different weatheric and lightning conditions, with a rate of detection=100% [1].With MSER, it is effective to identify the license plates of different size, angles and viewpoints. Based on this, Wei Wang, Qiaojing Jiang, Xi Zhou *et.al* tested about 450 images of size 720*450 in complex background and the rate of detection is 83.3% with detection time of 400ms per image. They also worked on vehicle face library extracted from one video sequence, where 159 vehicle face images of size 322*131 were tested, with the rate of 95.6% and detection time of 40ms per vehicle [1].HaoWooi Lim and Young HaurTay worked for license plate character detection technique in nature scene by using the technique of MSER and SIFT [5].Since in past decades to implement ANPR system many researchers have used high end desktop PC and high resolution camera for recognizing number plates. Optimization of template matching for ANPR is implemented on Android phone, which is used for detecting plates in Malaysia with accuracy of 97.46% [6].

III. PROPOSED SYSTEM

The car plates have blue characters on white background or black on yellow. Various algorithms has been used to capture the rear image of the vehicle. The MSER technique is also used for cleaning up the actual image captured. The ‘Feature-based number plate localization’ is one of the method used as an approach to do processing of the number plate recognition. Ostu’s method is used to adaptively convert the input gray-scale image into binary image.

The new method ‘Image Scissoring’ is used to scan the number plate in the vertical manner and scissored at the row (on which there is no white pixel), finally the scissored area is copied into new matrix. To identify the characters on the car number plate an OCR (optimal character recognition) is used. Though even we have low success rate for font variations of the car number plate. Artificial Neural Networks is one of the methods which are used to classify the characters.

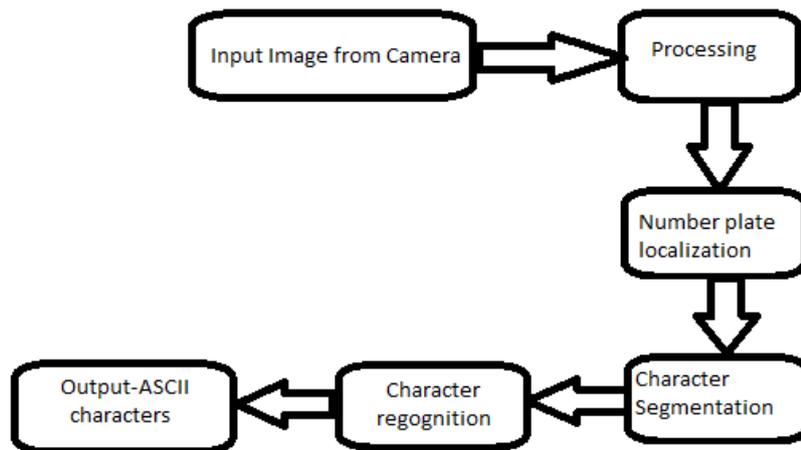


Fig. 1: Software flow of the system

Finally, to ensure that false characters are not recognized as a valid licence number by using syntax checking method. The following are some steps which is used to recognize the car number plate.

1. Image acquisition.
2. Candidate Region extraction.
3. Character Segmentation.
4. Character Recognition.
5. OCR(optimal character recognition).

IV. SYSTEM OVERVIEW

The car plates have blue characters on white background or black on yellow. By identifying the characters from the based on the pixels which are on the rows and columns and then this are compared with the those values to a set of templates and signature in the database. Two processes are used to identify the car number plate, one of the process is to extract the block of license plate from the initial image which contains the vehicle, and the second process is to extract characters from the license plate.

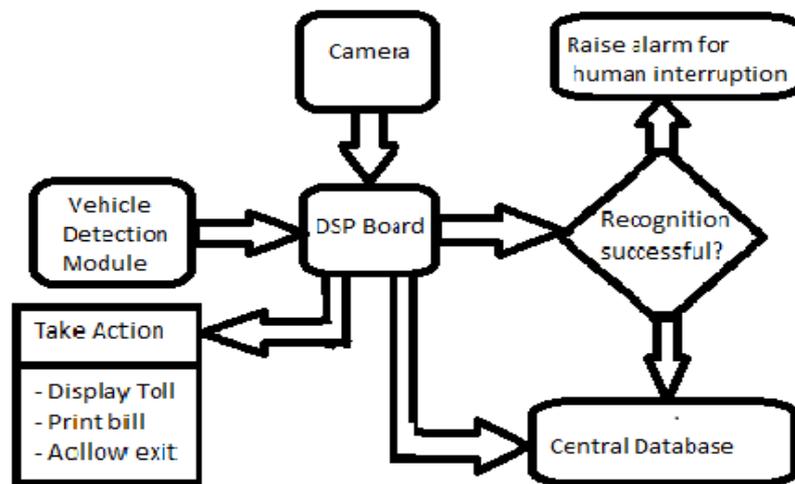


Fig. 2 : Overview of the system.

OCR technique is used to convert the actual images of a handwritten or typewritten text into machine encrypted text. The database in our system contains the actual good quality image along with the license plate which can be clearly recognized. Firstly we digitize each characters then obtain the number of white pixels and the black pixels and the relationship between them through histogram. To filter the noise we calculate the sum of the matrix column by column.

V. CONCLUSION

Our system recognizes the license plate of the car The MSER technique is used for cleaning up the actual image captured by the camera. The OCR technique is used to convert the actual images of a handwritten or typewritten text into machine encrypted text. Further this is stored in the database so that it is easy to recognize the car number plate. This system has real time application in surveillance of cars in parking, traffic monitoring systems with unattended parking lots, automatic toll collection and also for criminal pursuit.

ACKNOWLEDGEMENT

We take this opportunity to express my profound gratitude and deep regards to our guide Prof.Amol Baviskar and Co-ordinator Prof.Bharat Burghate for their exemplary guidance, monitoring and constant encouragement throughout the course of this thesis. The blessing, help and guidance given by them time to time and whatever valuable information provided by them in their respective fields. We are grateful for their cooperation during the period of my process.

REFERENCES

- [1] Wei Wang, Qiaojing Jiang, Xi Zhou, WenyinWan, Car License Plate Detection based on MSER 2011.
- [2] Chen, Z-X., et.al., Automatic License-Plate Location and Recognition Based on Feature Saliency. *IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY*, 2009.58(7):p.3781-3785.
- [3] HaoWooi Lim , Yong HaurTay, Detection of License Plate Characters in Natural Scene With MSER and SIFT unigram Classifier, 2010 3976.
- [4] Qadri, M.T. and M. Asif, Automatic Number Plate Recognition System for Vehicle Identification using Optical Character Recognition. *International Conference on Education Technology and Computer*, 2009: p.335-338.
- [5] Hao Wooi Lim , Yong HaurTay, Detection of License Plate Character in Natural Scene with MSER and SIFT unigram Classifier, 2010 3976.
- [6] Khalifa , O., et al., Malaysian Vehicle License Plate Recognition. *The International Arab Journal Information Technology*, 2002.4(4): p.359-364.
- [7] F.Ahmed and A.A.S.Awwal, 1993. An Adaptive Opto-electronic Neural Network for Associative Pattern Retrieval. *Journal of Parallel and Distributed Computing*, 17(3), pp.245-250.
- [8] Park et al, 2000. "OCR in a Hierarchical Feature Space", *IEEE Transactions*, 22(4), pp.400-407.
- [9] Krystian M-Tinne T-Cordelia Set al. A comparison of affine region detectors. *International Journal on Computer Vision*. 2005.65(2)-43-72.
- [10] Hamey, L.G.C and C. Priest, Automatic Number Plate Recognition for Australian Conditions. *Proceedings of the Digital Imaging Computing; Techniques and Applications*, 2005: p. 8.
- [11] Meier, R., *Professional Android 2 Application Development* 2010, Indianapolis, Indian: Willey Publishing, Inc. 399.
- [12] Matras J-Chum O-Urban Metal-Robust wide baseline stereo from maximally stable external Regions-Image and Vision Computing-2004- 22(10)-761-767.