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Review Paper on License Plate Recognition System

¹Ashwin Pillai, ²Adwin Manhar,

¹Student, ²Professor

¹Name of Department of 1st Author,

¹Amity University Chattisgarh, Raipur, India

ABSTRACT: There are exceptionally enormous number of vehicles in India as it is densely populated nation across world. There is a need of distinguishing vehicles precisely. This framework identifies the picture of the number plate of a vehicle from video, the number is extracted utilizing various techniques and calculations. The framework is appropriate for passageways of gates like colleges. At the point when any vehicle passes by the framework the video is caught and afterward video is changed over into pictures.

The methods include grayscale which turns the colorful image into grayscale, binarization which further converts the grayscale image into the black and white version, license plate detection which is to search for location of the license plate, character segmentation which separate the extracted characters individually and character recognition to transform the pixel into meaningful information. The system has demonstrated more than 90% success rate. In addition, the performance issue has addressed by omitting some pre-processing such as contrast enhancement, noise filtering, and histogram equalization.

Keywords: Automatic License Plate Recognition (ALPR), License Plate (LP), License Plate Recognition (LPR)

I. INTRODUCTION

There are huge number of vehicles in today's age. So, it is important to keep track on vehicles. In today's world we can utilize computers to keep track any vehicles without physically looking keeping track on vehicles due to which there will be better accuracy. Consequently, vehicle number plate recognition is an innovation utilized which distinguishes the number plate from video caught by the camera. It utilizes strategies like extraction of number plate, division, character recognition, etc.

The various researchers have proposed various techniques for each step and each individual strategy has its own advantages and disadvantages. The method for recognizing license plate includes the three main steps. That is the region of extraction of interest, extraction of plate numbers and recognition of character.

The initial step is capturing the vehicle picture with the LP from the camera. The computerized picture is then prepared to some helpful data by applying some picture handling methods. After obtaining the image, the grayscale features take place to the input image which is to find the average color value from the three main component color which are red, green and blue (RGB). After that, the grayscale image is further processed to the binarization and transform the grayscale image to only black and white for future use. With the image in black and white, the system performs license plate detection by searching through rectangle made up with all four white edges in the image which possibly contains the characters within. This step is crucial as the characters may not be detected when the license plate portion is incorrect. After cropping out the detected license plate, the system segments the characters into individual for the recognition purpose. After that, the segmented character is undergone through a process known as template matching one by one to find the most similar character from the pre-defined character template.

II. LITERATURE-REVIEW

There are several methods that have been surveyed into various phase of the whole LPR process. Some protocol developed previously are going to be discussed during this section. A big amount of work has been done over the last few years on image processing technique and deep learning for object detection purpose. Several different recognition and detection algorithms for vehicle reconnaissance have evolved during this field. Each stage has its own algorithm to accomplish the objective individually. A brief of each stage and the working behind is discussed in this segment. The precision of the outcome particularly subject on the resolution i.e., pixels of the image capture, the higher the resolution, the higher the accuracy of the result.

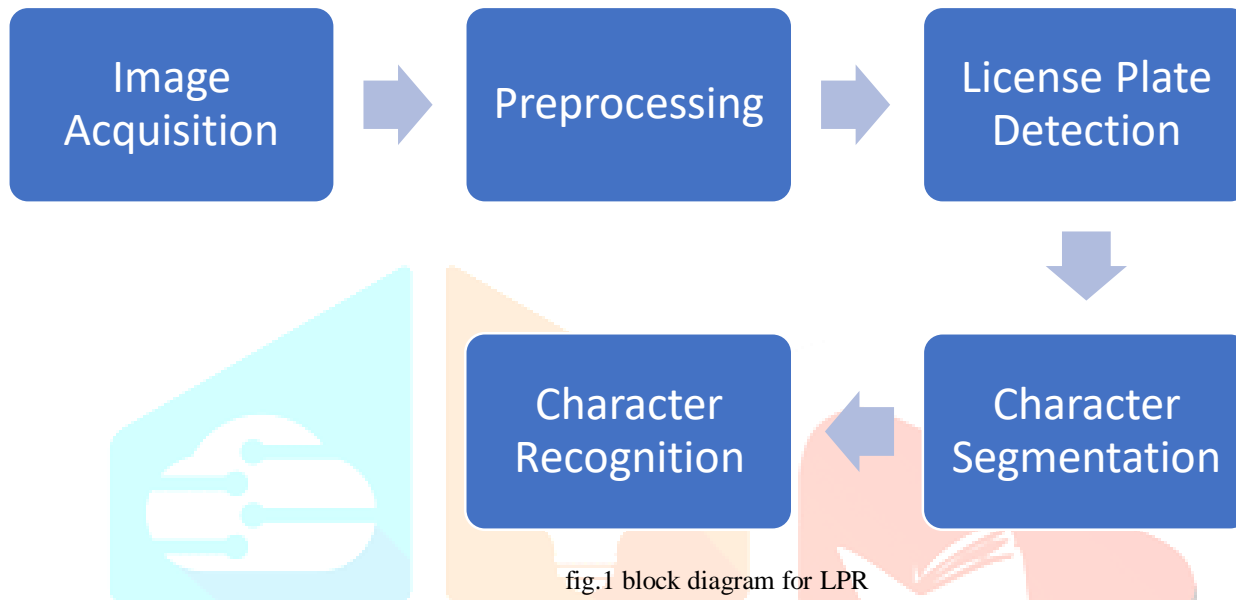


fig.1 block diagram for LPR

Andrew S. Agbemenu et. al (2018) proposed an ANPR method supported the characteristics and variations of the plates therein. The author has proposed during this work an algorithm that's enhanced to perform with Ghanaian car plate for conveyance. The designed model used two candidate detection algorithms because the detection of edges and therefore the algorithms matching the template. The device then implemented the character segmentation technique particularly with square plates to stop noise effects, arrangement of characters and skewing. At the ultimate point, character recognition was rendered with the utilization of tesseract OCR engine. Feature detection was slightly low but had an honest success rate, with 90.8 per cent accuracy. The optical character recognition successfully identified approximately 60 per cent of the detected plates [1].

Prashengit Dhar et. al (2018) developed an automatic LPR program to support ITS for the identification of Bangladeshi license plates. This work plate shows clearly white background with black fonts. Prewitt operators performed the detection of the amount plate to segment the sides. Morphological dilation was performed to intensify the points. Eventually, deep CNN was wont to accomplish the reconnaissance job. In character classification, the protocol showed a robust precision rate of 99.6 percent [3].

Ravi Kiran Varma P et al (2019) This paper discusses process for LPR of Indian Number Plates. This process uses several image processing techniques like, segmentation, contours are applied by border filtering and contours are filtered supported character dimensions and spatial recognition [2].

Nazmus Saif et. al (2019) have proposed a system to detect and recognize the Bangla car place from the vehicle picture by using the convolutional neural networks. during this work, main focus to choose convolution neural network within the designed system is preferred due to its configuration for the end-to-end pipeline. CNN clearly outperformed conventional image processing algorithms for their case, and compared generalized CNN models better in several scenarios. The detection research was done using YOLOv3 which consists of 53 convolutional model layers. The second stage after identification is image segmentation and recognition of the characters. During this step, the device whips out the number plate region then moves it to the second YOLO model for segmentation and platform image recognition. As a result, the model was checked with 200 images and properly recognized the car place number for 199 images, i.e. 99.5 percent accuracy rate [4].

YOUNG JUNG CHOONG et. al (2020) This technology enables the software to recognize the LP by itself from a digital image. The input image is then converted to a meaningful ASCII text which contains the LP. This paper discusses the series of method to recognize the LP. The methods includes grayscale which turns the colorful image into grayscale, binarization which further converts the grayscale image into the black and white version, LP detection which is to look for location of the LP, character segmentation which separate the

extracted characters individually and character recognition to rework the pixel into meaningful information. The system has demonstrated quite 90% success rate. Additionally, the performance issue has addressed by omitting some pre-processing like contrast enhancement, noise filtering, and histogram equalization [5].

III. Conclusion

Reviewing all the concerned Research Papers and Articles it can be thus concluded that device with powerful image processing technique can easily detect and identify interested vehicle's number plates. ANPR systems play an vital role within the growth of the smart transport network. Recognition may use the image processing technique combined with neural networks to identify the number plates. Detection of objects and neural networks is beneficial for detecting side views or tilted images and moving images from distance. For potential recognition systems, the choice is to use high-resolution cameras with an increased number of frames for good accuracies and improved accuracy for recognition in future.

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