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CAR NUMBER PLATE DETECTION AND RECOGNITION**JOYASHRI BASAK****STUDENT****DEPARTMENT OF COMPUTER SCIENCE****SIKKIM MANIPAL INSTITUTE OF TECHNOLOGY****MAJHITAR****DR. RATIKA PRADHAN****HEAD****DEPARTMENT OF COMPUTER APPLICATION****SIKKIM MANIPAL INSTITUTE OF TECHNOLOGY****MAJHITAR****ABSTRACT**

Car number plate detection and recognition is a very important field of digital image processing. Although, many researchers have already been worked on it but still it is not has been properly work on every image. In this paper we have analysis some existing algorithm or methods. On this basis of the analysis we have proposed an algorithm. This algorithm have five module: Pre-processing of images, localization of license plate, screw correction, segmentation of characters, number identification using template matching.

KEYWORDS

Detection, Localization, Recognition.

1. INTRODUCTION

We know that there are currently more than half a billion cars on road worldwide. Every car has its own identification number which is called the licence plate number. This number plays an important role in Public traffic. It is not possible for a person to monitor all the vehicles which are passing with their speed and note down their licence number. So detection of those license plate and recognition there character is a very important research topic now a day. License plate recognition applies image processing and character recognition technology to identify vehicles by reading their license plates. Anti-terrorism and public security is increasing worldwide, so the global law enforcement has been deploying vehicle license plate recognition systems. Mostly vehicles used by criminals are either stolen vehicles or vehicles hung with stolen license plates. Mostly vehicle make accident and run away from their leaving no trace. Using this recognition we can trace them. License plate recognition is also significant to save the lives and the properties of the chauffeurs, the passengers and to improve the stability and the authority of the law execution in transportation. The two major values license plate recognition adds to systems are automation and security.

2. LITERATURE SURVEY

We have analyst some papers on this field. This are stated below.

Ronak P Patel[1] have proposed an algorithms. They use Morphological operation, Thresholding operation, Edge detection, Bounding box analysis for number plate extraction, character separation using Segmentation and character recognition using Template method. In this methods have disadvantages of angle of image and it cannot detect two row license plate. Kuo-Ming Hung[2] uses the probability distribution of the license plate between the two lights barking in the captured image. we use the morphology method Black Top-Hat to enhance the level of separation of the license plate characters. But if the light of head light of the car behind is not bright enough, it will result in weak edge characteristics of the character and LP background. That will cause the LP region to be treated as noise and being filtered out, and effect the positioning of the LP. Kumar Parasuraman [3] has proposed algorithm consists of three major parts: Extraction of plate region, segmentation of characters and recognition of plate characters. For extracting the Plate region, edge detection algorithm and vertical projection method are used. In segmentation part, filtering, thinning and vertical and horizontal projection are used. And finally, chain code concept with different parameter is used for recognition of the characters. But by this technique angled image cannot be detected properly. Er. Kavneet Kaur[4] have proposed algorithm has three major parts:

vehicle number plate extraction, character segmentation and Optical Character Recognition (OCR). Number plate extraction is that stage where vehicle number plate is detected. font type, noise in image, tilting etc are big issue in their proposal. Prathamesh Kulkarni[5] use feature based methodology for localization of Indian number plates. And then features of number plates are used to find the probable number plate locations. The major sources of error were the tilt of the number plate, the non-English script and extreme variation in the dimensions of the characters. Zyad Shaaban[6] proposed three stages: detection and extraction of a license plate area by video camera segmentation of the plate characters and digits and character and digit recognition. It has the problem of recognizing the colour of plates and the old types of plates. Cosmo H. Munuo[7] uses the steps, license plate; localization, sizing and orientation, normalization, character recognitions and geometric analysis. There are some other papers which are listed below.

TABLE 1: COMPARISON TABLE AMONG VARIOUS RESEARCH WORK

Sr. No.	Year of Publication	Author	Paper Title	Methods	Research Gap
1.	2012	Arulmozhi, K. Centre for Inf. Technol. & Eng., M.S. Univ., Tirunelveli, India Perumal, S.A.; Siddick, A.; Nallaperumal, K.	Image enhancement techniques on Indian license plate localized image for improved character segmentation	Using LPR algorithms consists of three steps 1)location of license plate 2)segmentation It also use skew technique ,Adaptive threshold ,Otsu threshold	It only works on the image modification. There has no discussion on character recognition.
2.	2011	VinhDu Mai; Dept. of Comput. Sci. & Technol., Tongji Univ., Shanghai, China ; Duoqian Miao; Ruizhi Wang; Hongyun Zhang	An improved method for Vietnam License Plate location	Morphology operation on grayscale image, image subtract operation on grayscale image, image binarization based on threshold, edge detection use Canny operator, morphology operation on binary image, finding the license plate (LP) angle & rotating LP based Radon transform and bilinear interpolation, and then cutting exactly license plate region based on measuring properties of Vietnam license plate regions	It only works on image of license plate. It does not tell the various size of character recognition of image of license plate
3.	2013	Jinn-Li Tan; ECE Dept., Univ. Teknol. Malaysia, Skudai, Malaysia ; Abu-Bakar, S.A.R.; Mokji, M.M.	License plate localization based on edge-geometrical features using morphological approach	Gaussian operation followed by Sobel vertical edge mask. Prior to that, gamma correction is applied to increase the detection of edges. morphological operations and calculate geometrical features of these regions and use rule-based classifier to correctly identify the true plate region.	It does not discuss about character recognition
4.	2009	Kulkarni, P.; Dept. of Electron. & Telecommun., Univ. of Pune, Pune, India ; Khatri, A.; Banga, P.; Shah, K.	A feature based approach for localization of Indian number plates	A two-step approach for localization is presented. In the first step, the features of characters are used to find the probable characters locations. In the second step, the features of number plates are used to find the probable number plate locations	The major sources of error were the tilt of the number plate, the non-English script and extreme variation in the dimensions of the characters, which can be aptly removed by enhancing the approach further.
5	2010	Babu, C.N.K.; C. M. S. Coll. of Eng., CMS Nagar, Namakkal, India ; Siva Subramanian, T.; Parasuraman, K.	A feature based approach for license plate-recognition of Indian number plates	Adaptive median filter is applied to remove the noise from the image.	It does not work on double row license plate

3. LICENSE PLATE LOCALIZATION AND DETECTION

A. Preprocessing

The image is captured using a digital camera. The image file is saved in jpg or jpeg format. The input isolated image is filtered to improve the quality of the image or to reduce the resolution of the image by using filters.

B. Edge Detection

Edge detection is a fundamental step in several fields such as pattern recognition, image processing and computer vision and the first step of image analysis and understanding. Edges define the boundaries between regions in an image, which helps with segmentation and image recognition. The classification of edge detection introduced in is based on the behavioural study of these edges with respect to the following differentiation operators: Gradient edge Detectors (first derivative or classical), Zero crossing (second derivative), Laplacian of Gaussian (LoG), Gaussian edge detectors, colour edge detectors. In this paper, Prewitt detector operator is used to obtain the edge detection image.

C. Plate Extraction

The input image is convert to grey scale. Then the grey scale image is then converted into binary image. Here we use bounding box to take the license plate region. With the proportion of height and width select the license plate region. The following steps:

- Step1: Determine the vertical borders of the rectangle plate by applying the horizontal run length on edged binary image. Then the vertical run length encoding is applied.
- Step2: Determine the vertical borders of the rectangle plate by applying the vertical run length on edged binary image. Then the horizontal run length encoding is applied.
- Step 3: Apply the vertical and horizontal histograms on the images obtained from step 1 and 2

D. Normalization

There are several methods to compute the skew angle for the vehicle license plate: horizontal skew, vertical skew and combination of both horizontal and vertical skew .we have we the skew detection operation and element the skew angle.

E. Segmentation

The plate image determined using the above steps is converted into binary image. Then bounding box operation is done on the binary image and segments the characters in separate box. Each box are then resized into the same size of template images.

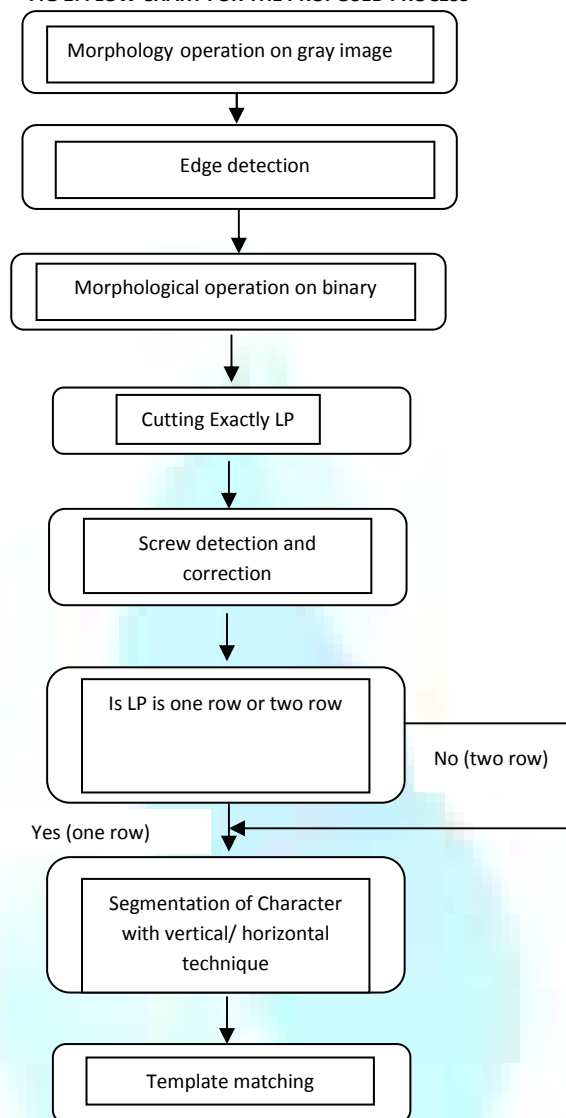
F. Template matching

Normalized character image compare with each template character image and find correlation between segmented character and template character. Selecting the most relevant image and write into text file.

4. PROPOSED WORK

License plate detection and recognition is an image processing technology and it is a very important field of research. It identifies the vehicle with their license plate number. It keeps the huge data of the vehicles without any human interaction. Basically this work can be consists of four phases:-Pre-processing of image, number plate extraction, character segmentation, character recognition. The proposed work can be shown through a flow chart as below:

FIG 1: FLOW CHART FOR THE PROPOSED PROCESS



5. CONCLUSION

On the basic of literature survey we have taken some problem which were not yet solved. In this paper we tried to solve those problems. On the basic of the proposed algorithm we can solve the existing problem

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