License Number Plate Recognition System

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Abstract

License number plate recognition (LNPR) is used in transport system for security application including monitoring the traffic condition and monitoring the street problems. In this paper, the license plate extraction algorithm is based on the Preprocessing, Morphological operation, Histogram specification and Bounding Box Segmentation, Detection. The dataset images are taken from the various scenes which including different angles, various lightening conditions etc. The project has been implemented by using MATLAB. The accuracy of this system is 99%. The support vector machine (SVM) is used to classify the features of the number plate. The result is better then compared to existing methods.

Key words - *preprocessing, character segmentation, character regnition.*

I. INTRODUCTION

The license number plate recognition system is an important part of service. In the LNPR process, there are various problems are arises such as variation in size, contrast of plates, high speed of vehicle. These problems are overcomed by preprocessing, segmentation and recognition which is also used to improve the accuracy of the system. In these days, there are various method is used for LNPR extraction are widely used that is Edge detection, Hough transform. But some methods are very difficult to remove the backgrounds, illumination, angles. T his approaches work only under restricted conditions such as fixed illumination, limited speed of vehicle,stationary backrounds,etc.

II. RELATED WORK

License numper plate recognition system using Jobin[1]introduced an ALPR system based on stoke width transform which primarily consist of three steps :1)removing of motion bluring in an image utilizing interleaved plane pixel layers, 2) edge detection through plane and vertical mask,and,3) utillazation of ocr from the recognition.the introduced method work effectively under light variation and even under shadow .Cinsdikici. [2] suggested a new information retrival system of numper plate recognition.the suggested method was combination of two major steps namely,character segmentation and number recognition.he segmentation step compresed of a ROI extraction using Kaiser resizing , morphological operation, artificial shifting, and bidirectional vertical thresholding .for recognition, first eigen –space features or extracted which were then utilized through principle component analaysis and back-propagation neural networks.Rasheed[3] introduced a robust method for LPR based on Houghlines utilizing hough transform .the introduced method comprised of two major types: 1)numper plate detection using canny edge detector and hough transformation and 2)recognition with template matching .the experimental were done on 102 images having different illumination conditions.Viola Jones [4]object detector proposed by Limperger.

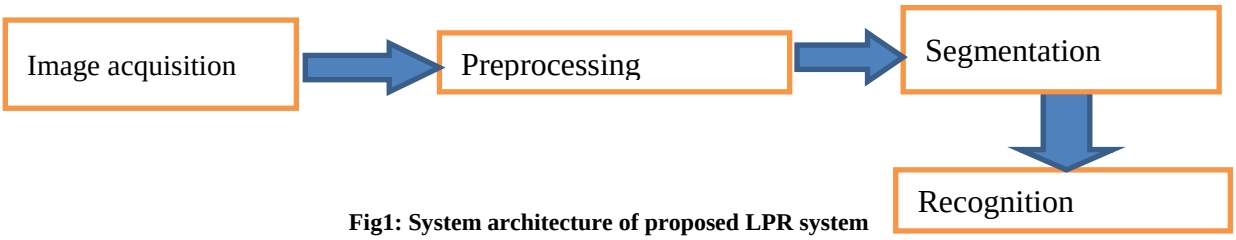


Fig1: System architecture of proposed LPR system

III. PROPOSED WORK

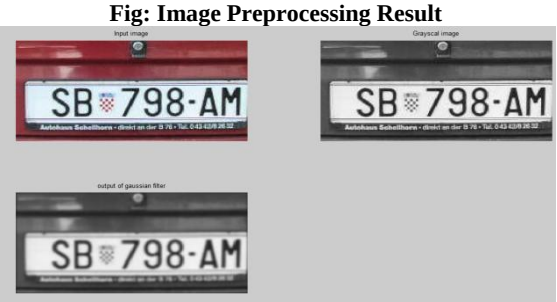
In this section, we are limited to our proposed work which comprised of four major steps of: 1)preprocessing,2)segmentation, 3)number recognition. In preprocessing step, we use grayscale convertion, Gaussian filter to get noise removed image. In histogram step, to get the graphical representation of pixel distribution. In segmentation step ,we initialy perform morphological operation of erosion and dilation are utilised to make to make segmented image more accurate. Next we used bounding box method to extract the number. Finally, the extracted number are fused and fed to svm classifier for number plate recognition. The dilated

diagram of the proposed algorithm is shown in Fig. 1. Each section described below in detail.

IV. PREPROCESSING

In preprocessing step, we first utilised grayscale convertion , which is convert the RCB(24 bit) to gray image (8 bit). The RGP doesn't help us identity important edges or other features. The gray(black and white) image is the range of white(255),black(0). The gray image may lost low contrast, remove shadows. The bits are representation by unit 8, unit 16. The next utilised Gaussian filter, it will blur the edges and reduce contrast, which is used to remove the noise and smoothing the image.

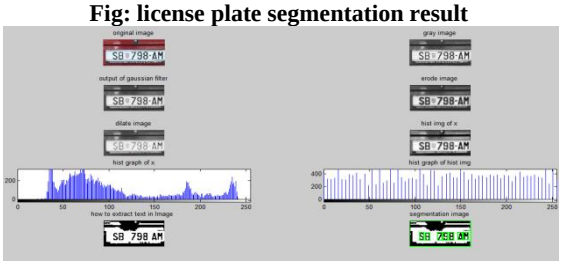
Fig: Image Preprocessing Result



VI. SEGMENTSTION

In the segmentation steps, the processed Gaussian image, extracted the previous steps. We utilised erosion and dilation. The erosion is remove the pixel in object or image boundaries.the dilation is adds pixel to the boundary the next step is histogram, which is the graphical representation of pixel distribution as a function of tonal variation(brightness). It can be analysed for peak or valleys this threshold value can then be used for image segmentation. The finally we used bounding box method. The segmentation of image is required to identify the regions which can provide information about license plate and also the coordinates of such region.

Fig: license plate segmentation result



VII. CLASSIFICATION

The fused feature vector is finally utilised through SVM for license number recognition. The SVM is a supervised learning classifier utilised for the prediction of class labels. It transforms features into a higher dimension space, where it implements the optimal hyperplane that describes the classes. The hyperplane work is based on the maximum margin between itself and those who is nearest to it. The nearest set of points are called support vectors.

V. EXPERIMENTAL RESULT

In the section, we discuss the performance of our proposed algorithm. For training and testing, we utilised Caltech developed by our lab. The sample images are shown in Fig. 6 where every image is captured with the consideration of different views and different angles. Additionally, proposed algorithm is tested on two publically available datasets named as Caltech car dataset and Medialab LPR dataset. The simulation is done in Maylab 2009.

VIII. CONCLUTION

In this paper, The proposed system comprises of three major step: 1) preprocessing 2) segmentation 3) character recognition. With proposed method, we have tried our best to deal with different problems of light variation, occlusion, and so on. The simulation results confirm that, with our novel idea, we have managed to tackle above mentioned problems. Moreover, it is also concluded that a cascaded design can comfortably manage mentioned problem at its early stages and also the selection of good features results in improved classification accuracy. As a future work, we will add few more set of features and will implement improved features selection technique to reduce the error rate and increase the recognition rate

REFERENCES

[1] Jobin, K.V., Jiji, C.V., Anurenjan, P.R.: 'Automatic number plate recognition system using modified stroke width transform'. Fourth National Conf. on Computer Vision, Pattern Recognition, Image Processing and Graphics (NCVPRIPG), 2013, 2013, pp. 1–4

[2] Cinsdikici, M., Ugur, A., Tunalı, T.: 'Automatic number plate information extraction and recognition for intelligent transportation system', Imaging Sci. J., 2013, **55**, (2), pp. 102–113

[3] Rasheed, S., Naeem, A., Ishaq, O.: 'Automated number plate recognition using Hough lines and template matching'. Proc. of the World Congress on Engineering and Computer Science, 2012, vol. **1**, pp. 24–26