

Identification of Vehicle by Number Plate Recognition using Convolution Neural Network

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ABSTRACT

Automatic Vehicle identification has many applications in traffic systems like toll collection and checkpoint automatic vehicle identification is an essential stage in intelligent traffic. We are using optical character reorganization and classification from an image for the recognition to be accurate, certain topological and geometrical properties will calculate based on which character will classify and recognize. The features such as strokes, curves, protrusions, enclosures etc., these properties called vector and convolution neural network that uses this feature vector. We are also using template matching. In digital processing template matching technique is used for finding small part of image which match a template image and to extract letters and digits. In this system we are using CNN to get its input in a form of feature vector this is to say that every feature or a property is separated and assigned a numeric value. Thus, after number plate recognition system will display information about the vehicle and it will also search by its feature. From this project, we hope that we will identify theft vehicle to provide security in cyber crime.

I. PROBLEM STATEMENT

An 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, vertical and horizontal projections are used. Finally, chain code concept with different parameter is used for recognition of the characters. The performance of system will testing on real images. To develop system that way of extracting the text from image with help of contour analysis. Preliminary handling of the image - smoothing, a filtration of noise, contrast raise is performed. The next step will be binarization of the image and selection of boundaries of objects.

II. LITERATURE SURVEY

In 2016 vehicle plate recognition is becoming the most challenging and interesting topic of surveillance. It is challenging because number plate comes in different size, shape and written in different font style. It is interesting because of its use in security applications. In this paper we have proposed a robust and simple approach based on edge detection and segmentation with morphological operations. Our suggested approach is performed in three steps: In first step detection of license plate is performed. In second step, segmentation of character is done from detected number plate. While in the third step, recognition of segmented character is performed. We

have tested several images taken under different weather condition to check the validity, robustness and efficiency of our algorithm. The result of our experiments is very satisfactory and opens the track of our algorithm to be used in many real life applications.

□ In 2015 there are several algorithms and methods that could be applied to perform the character recognition stage of an automatic number plate recognition system; however, the constraints of having a high recognition rate and real-time processing should be taken into consideration. In this paper four algorithms applied to Qatari number plates are presented and Compared. The proposed algorithms are based on feature extraction (vector crossing, zoning, combined zoning and vector crossing) and template matching techniques. All four proposed algorithms have been implemented and tested using MATLAB. A total of 2790 Qatari binary character images were used to test the algorithms. Template matching based algorithm showed the highest recognition rate of 99.5% with an average time of 1.95 ms per character.

□ In 2014 license plate recognition (LPR) plays a significant role throughout this busy world, owing to the rise in vehicles day by day. Stealing of vehicles, breaking traffic rules, coming into restricted space also are increasing linearly, thus to dam this act registration code recognition is intended. Among the fundamental process steps such as detection of number plate, segmentation of characters and recognition of each characters, segmentation plays an important art, since the accuracy of recognition is based on how perfect the segmentation is done. To avoid problems like unwanted Identification of Vehicle by Number Plate Recognition using Convolution Neural Network Department of Computer Engineering Page 9 illumination, tilt that degrades the segmentation which in turn affects the recognition accuracy numerous algorithms are developed for this work. This paper presents a strong technique for localisation, segmentation and recognition of the characters within the located plate. Images from still cameras or videos are obtained and regenerated in to grayscale images. Hough lines are determined using Hough transform and therefore the segmentation of grey scale image generated by finding edges for smoothing image is employed to cut back the quantity of connected part and then connected part is calculated. Finally, single character within the registration code is detected. The aim is to indicate that the planned technique achieved high accuracy by optimizing numerous parameters that has higher recognition rate than the standard ways.

□ In 2013 with the development of vehicles and the increasing number of cars in modern society, people pay more and more attention to the vehicle license plate recognition system. Vehicle license plate recognition is divided into three parts: license positioning, character segmentation and character recognition. This paper proposes a new way of vehicle license plate recognition. In license positioning, the license positioning method is based on median filtering double edge detection; in character segmentation, it adopts a combinative method of locating the original level and improved vertical projection segmentation algorithm; in character recognition, the recognition method is based on classification template matching of font characteristics. The proposed license recognition method focuses on the timeliness of recognition process. Its smaller calculation largely reduces the time of license recognition, with high accuracy and precision rate at the same time.

III. DESIGN AND IMPLEMENTATION

Standard Development Tools

□ The this application is designed from a user point of view as well as government point of view. The user friendly design helps the users in accomplishing their task with ease. Attempts have been made to keep the design simple and understandable.

□ The screens were designed in MATLAB software. The database used is MYSQL where all the local information related to the users is stored.

□ The system shall be built using a standard MATLAB development tool for implementation and various MATLAB functionality are used for image processing.

IV. CONSTRAINTS, ASSUMPTIONS AND DEPENDENCIES

For simplicity and ensuring computability, the system makes the following assumptions

□ Users are expected to look at the augmented view provided on the screen

□ Users have access to a mouse controller that controls the pointer of the screen

□ Camera should not have any flaws on its lens

□ There should not be any obstacle between the camera and the road

□ Camera is connected to the laptop that does the processing and viewing

□ Camera will be 3 meters high looking from 45 degree

□ Speed of cars will be lower than 20 km /hour

□ There will be at least 5 meters between each car

□ All cars information are stored in the database

V. SYSTEM FEATURES

“Identification of Vehicle by Number Plate Recognition using Convolution Neural

Network” System is actually a system that enhanced traffic problems. What does this system

can perform compared to the previous system is the extra function that will be added into the

system, based on the requirement in order to upgrade the management system to a fully computerized systems.

1. For static OCR, software should provide a way to load scanned document for recognition purpose.

2. If scanned image is not having black background and white foreground, facility for image inversion should be provided by software.

3. Software should process the image and extract characters.

4. User should have facility to save extracted data in format of his interest.

5. For dynamic OCR, the software should recognize characters drawn by uses imultaneously.

6. If software is not giving proper output, there should be a way for training the database of software.

According to the requirements the designed system should have these functional requirements:

Insert owner information

Insert car information

Edit owner information

Edit car information

Update owner information

Update car information

Delete owner information

Delete car information

Recognize plate number
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Record plate number and owner information with time stamp

Search information using model no, color, number

Detection of illegal Number plate

VI. ARCHITECTURE DESCRIPTION

1. Taking video as input and convert into frames for number plate recognition

2. Image Proprocessing

The major cause of failure in detecting the number plate from the vehicle is low quality of

image. The preprocessing algorithm helps in improving the quality of the image or the plate image being inputted to the system.

This involves resizing the image that is been taken for optimization purposes. Resizing is

helpful since image quality differs and in order to localize the number plate or be able to

recognize the number plate on the image resizing will be very helpful.

3. Number plate Detection and Segmentation

This Block will detect number plate and segmentation will be process on it.

Segmentation is important in two phases of the process:

1. Obtaining training samples

The easiest way to obtain training samples is to segment an image and ask a human supervisor to classify each glyph.

2. Recognizing new image after training

As a _rst step for trying to recognize a new input image, it must be segmented into glyphs. An

additional requirement here is to obtain the glyphs in correct order as well to make this easier,

the input image is rst divided into lines and then segmented into glyphs.

4. Optimal Character Recognition using convolution neural network

The problem of OCR is fairly simple:

Input: scanned images of printed text

Output: Computer readable version of input contents

There are several existing solutions to perform this task for English text. The potential

benefits of this approach is its exibility, since it makes no prior assumptions on the language

of the text, and it should be possible to extend it to other alphabets.

5. It will check detected vehicle using supervised trained database after that it will displa

vehicles information by Features with appropriate log sheet with timestamp.

VII. CONCLUSION

Automatic Vehicle identification has many applications in traffic systems like toll

collection and checkpoint automatic vehicle identification is an essential stage in intelligent

traffic. We are using optical character reorganization and classification from an image for the

recognition to be accurate, certain topological and geometrical properties will calculate based

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VIII. REFERENCES

[1] Anu Agarwal, Sudhir Goswami, “An Efficient Algorithm for Automatic Car Plate

Detection & Recognition”, 2016 Second International Conference on Computational

Intelligence & Communication Technology, 2016 IEEE.

[2] Eva Volna, Martin Kotyrba, “Vision system for licence plate recognition based on neural

networks”, International Conference on Computational Intelligence & Communication Technology, 2015.

[3] Priyanka Prabhakar, Anupama P, Resmi S R, “Automatic Vehicle Number Plate Detection And Recognition”, 2014 IEEE.

[4] Norizam Sulaiman, Sri Nor Hafidah Mohammad Jalani, Mahfuzah Mustafa, Kamarul Hawari, “Development of Automatic Vehicle Plate Detection System”, 2013 3rd International Conference on System Engineering and Technology, 19 - 20 Aug. 2013, Shah Alam, Malaysia, 2013 IEEE.