Novel Licence Plate Extraction with Character Recognition

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ABSTRACT: *This paper proposes an algorithm that automatically reads license plate from videos that has taken from personal devices. Commonly used license plate reader in toll payment or road control system, video from personal devices usually has more variation in viewing angle, resolution, and shutter speed and so on. This work read single frame from video first, then extract the license plate by detecting high-density vertical edge areas and filtered by color and boundary features. Then the pre-processing step automatically correct the rotation of the image, remove the background noise and segment the character portion of the license plate. Lastly, this algorithm recognizes plate with template matching and filters the peaks by peak intensity and coordinates. Based on these, videos with multiple frames can improve the overall accuracy and reliability.*

Keywords: Edge detection; Hough transform; Morphological image processing; template matching.

I.INTRODUCTION

Automatic license plate reader is also called as Automatic number plate recognition (ANPR). It was first invented at the Police Scientific Development Branch in the UK in 1976 and is widely utilized among police forces worldwide today as it is essential for numerous real-life applications, such as traffic control, automatic toll collection and road traffic monitoring. These systems usually require special hardware: one or more road-rule enforcement cameras, a single camera with assistant IR illumination, or closed-circuit television are often used.

On the software side, ANPR typically detect the location of the license plate in an image first, pre-process the plate image by orientation and sizing correction, and segment the useful information portion of the license plate, finally it uses optical character recognition (OCR) to read the plate. Additional processing to check characters and positions to classify license plate and link license plate information to some database are often needed depending on the applications.

The variation of the plate types and environmental differences increases the complexity of both the detection and recognitions part. The plate variation includes:

1) Plate location including both plate images locates at different position of an image, and also the numerical information locates at different place of the license plate.
2) Language and character font, special characters, total number of characters
3) Color, includes both character and background color and pattern
4) Special plate such as for disabled people and special characters and so on.

Also variety of plate frames that are commonly used on the car can also cause additional noise to the recognition results.

There are also imaging variations when pictures or videos are taken, these includes illumination (day, night, additional illumination beam etc.), similar pattern as background noise, camera resolution, camera shutter speed, motion blur (both from camera and from car), viewing angle, number of cameras and so on. The accuracy and reliability of the ANPR system is always a key part of the algorithm, thus much effort has been made to increase the ALPR reliability and accurate. Recently, ALPR also gets interest beyond the police forces as personal cameras are more available and the computing hardware gets cheaper and cheaper.

II.EXISTED SYSTEM

As population is increasing traffic on roads is also increasing and with increase in traffic, crime related to it is increasing at greater rate. Various cases of theft, hit and run, robbery, kidnapping, smuggling, on-road fatalities, etc remain unsolved because the vehicle involved could not be recognized accurately as it is not fissile for human eye to verify object or characters from license plate of fast moving vehicles.

A toll gate is a point of entry to a space enclosed by walls, or a moderately sized opening in some sort of fence. The main advantage of a toll gate is the opportunity to keep track of vehicles plying the highways, bridges, and tunnels on which the system is installed.

Fig 2. Existed system

The system enhances the collection of entrance payments which is done either manually or electronically. The manual mode of payment poses problems such as congestion at toll gates, especially during festive seasons when traffic tends to be heavier than normal. This incontinency results in fatigue and inaccuracy in the automation of the system. Hence, we can solve these problems by automatic license plate recognition which provides efficient performance.

A heavily polluted Paris was plunged into traffic chaos today as police handed out fines to drivers for utilizing their cars illegally. A new policy introduced today means drivers in the French capital can only utilize their cars every other day alternating for cars with odd and even number plates in a bid to make the air cleaner.

The drastic measure follows grey smog settling over the French capital from the middle of last week. Some 700 extra officers were out on the street to man 60 checkpoints ensuring that only cars and motor bikes with

number plates ending in odd numbers were out on the streets.

III.PROPOSED SYSTEM

The software model of proposed system utilizes the image processing technology. The programs are implemented in MATLAB. The algorithm is divided into following parts: Capture image, Pre-processing, Plate region extraction, Segmentation of character in the extracted number plate, Character recognition, Comparison with database and Indicate result. The flow chart of license plate recognition system implementation in this work is shown in the figure (1). There are various steps in this approach and these are implementation in MATLAB.
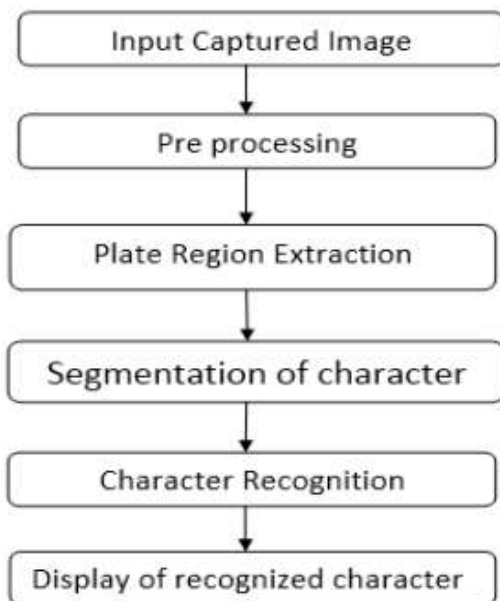

Fig 1. Proposed system

Capture of Image: The first step is the capture of image. The image is captured by electronic device that is Digital Camera or Webcam. The image captured is stored in

JPEG format. Later on it is converted in to gray scale image in MATLAB.

Pre-processing: The next step after capturing the image is the pre processing of the image. When the image is captured there is lot of disturbances and noises present in the image for which the image can't be used properly. So in this step the noises from the image are required to be cleared to obtain an accurate result.

a. Gray Processing: This step involves the conversion of image in to Gray levels. Color images are converted in to Gray image. It calculates the value of gray value, according to the R, G, B value in the image, and attains the gray image at the same time.

b. Median Filtering: Media filtering is the step for removing the noises from the image. Gray level cannot remove the noises. So to make image free from noise media filtering is utilized.

Plate region extraction: The most important stage is the extraction of number plate from eroded image significantly. The extraction can be done by utilizing image segmentation method. There are numerous image segmentation methods available in various literatures. In most of the methods image binarisation is utilized.

Character segmentation: In this step get the output of extracted number plate by utilizing labeling components, and then separate each character and split the each and every character in the number plate image by using split and also find the length of the number plate, then find the correlation

and database if both the value is same means it will generate the value 0-9 and A - Z, and finally convert the value to string and display it in edit box, and also store the character in some text file in this code.

IV. RESULTS
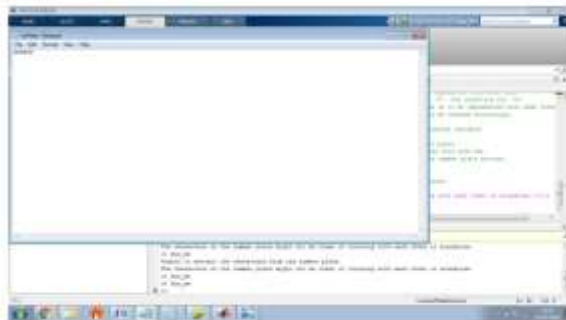

Fig 2. License plate sample

Fig 3. License plate recognition
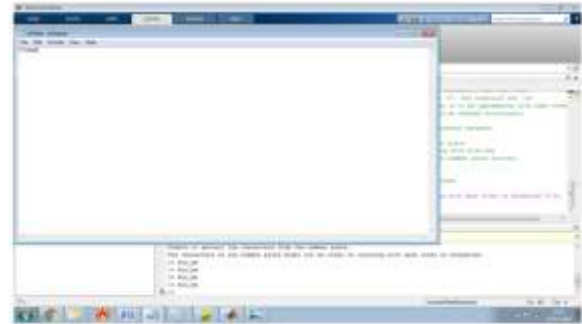

Fig 4. License plate sample

Fig 5. License plate recognition

V. CONCLUSION

In this paper, first read the video into single frame images. Then extract the license plate part from the image by detecting high-density vertical edge areas and filtered by color feature and boundary conditions. Then, run pre-processing to correct the rotation of the image, remove the additional noise and background, and segment the character portion of the license plate. Lastly, use a template matching on small sets to find best sizing scaling factor and then with all 26 letter, 10 numbers and special characters to find the peaks and filter out the false signal by peak intensity and coordinates. The software successfully reads videos and displays the license plate location in the original image with the recognition results.

VI. FUTURE SCOPE

In future work, we aim to focus on night surveillance and to improve the existing algorithms reported in literature. However, the other segments of our suggested system should be improved, focusing on the occlusion handling, vehicle matching procedure and also focus on improving the accuracy measure for character recognition

by using the concept of neural network for recognising all font type of a character by using back propagation algorithm. In this, first the network is trained and to train the network, the input and target are required. After the network had been successfully trained, the segmented character in license plate can now inputted the neural network to simulation. Ideally, the input characters will compare with the data that trained in neural network, and then outputted the ASCII code for corresponding input character.

VII.REFERENCES

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