LICENSE PLATE RECOGNITION USING IMAGE PROCESSING, OPEN CV AND EASY OCR

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Abstract : In Today's generation the traffic is the real problem of the people's live in the society. Automatic License Plate Recognition System Is the real time embedded system which can be automatically detect/recognizes the License Plate of Vehicles. There are many applications range from complex security System to common area and from Parking admission to City Traffic Control. There are many ALPR (Automatic license Plate Recognition) Systems are built using proper tools like MATLAB. The number plate Condition, non-standardized formats, complex scenes, camera quality, camera mount position, tolerances distortion, motion-blur etc. they may be undetermined its performance. The Internet-Of-Things is beginning to shape Future of many Industries and its Paying new ways for ITS. Deep-Learning Techniques are widely Utilized by CV field for better Detection rates. This research aims to the advance and presenting a survey of Extraction, segmentation, and recognition techniques while providing the proper Guidelines on future Trends in this Area.*.*

IndexTerms **- OpenCv, Optical Character Recognition (OCR),Automatic license plate recognition (ALPR) .**

I. INTRODUCTION

Automatic Number Plate Recognition (ANPR) has become a part of our lives and promise to stay in future, integrable with Proposed transportation Technologies. It had become over the years mobile, first being Deployed in vehicles, but now more recently with the advent of smart phone technology, there are many ALPR Systems have become handled too. ANPR contracts with local and federal Governments tend to be highly competitive. Because of that, it's often not the trained model that is valuable, but instead the dataset that is given company has curated. Python gives us the ability to create our License plate detection and recognition program. We achieve this by using three of its Libraries, PyTesseract, Imutils, and OpenCv. I have come across plenty of computer vision projects involving the Human face and/or body. As such, I decided to pursue the project on car License plates instead, which is slightly less explored. This system can be used in parking to take a Picture of the vehicle and log vehicle number in the database. The number of any Vehicle once obtained as text, can be displayed, saved in a database, or can be searched through the entire database for the details. The Number plate is displayed as a text on the terminal using the Principal of OCR with the help of PyTesseract and Tesseract engine.

II. BLOCK DIAGRAM AND OPERATION

Components and Technologies used in LPR system are:

· FrontEnd- Tkinter

· BackEnd- Python

· IDE- Jupyter

· Database- SQlite3
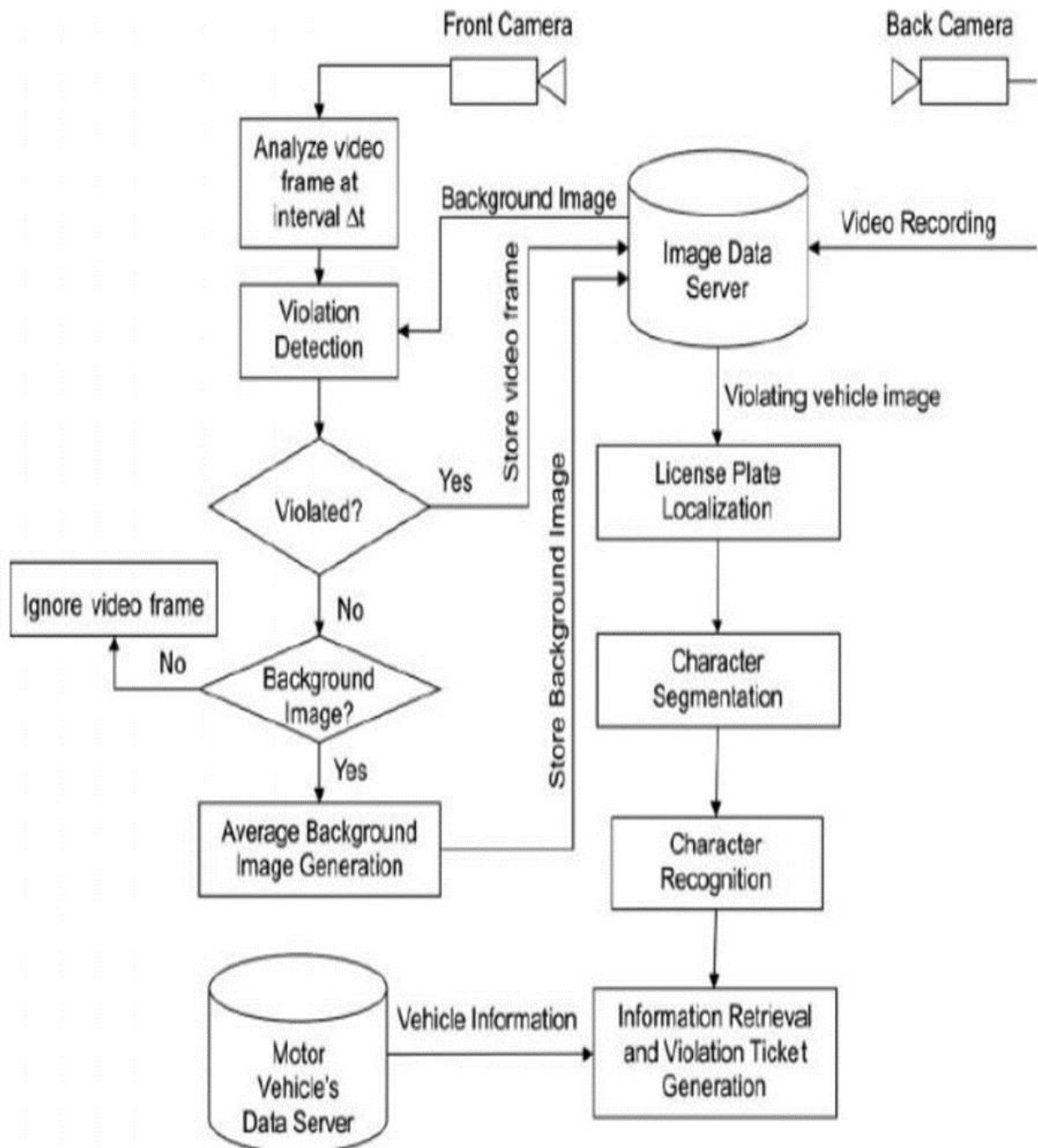
· Scikit-image

· OpenCV

Fig 1: Data Flow Diagram of LPR system

2.1 License Plate Detection

To detect the number or license plate we need to find the contours on the image. It is important for binarize and morph the image before finding contours so that it can find more relevant and a smaller number of contours in the image. The contours in the validated region and validate the side ratios and the area of the bounding rectangle of the largest contour in the region. After validating you will get a perfect contour of a number plate. The image plate can have different lightning conditions in different areas, in those cases adaptive thresholding can be used.

2.2 Character Segmentation

Segmentation is nothing but breaking the whole image into subparts to process them further. Pixels representing useful information are called Foreground Pixels, and the pixels that are not foreground pixels are called Background pixels. In line level segmentation, we are provided with a skew corrected image containing text written in the form of lines. The objective of line level segmentation is to segment the image into lines. Rows that represent the gaps in between the lines have high no. of background pixels, which correspond to lower peaks in the histogram.

2.3 Character Recognition

Optical character recognition, is a process of recognizing text inside images and converting it into an electronic form. These images could be of handwritten text, printed text like documents, receipts, name cards etc. This makes it very easy and efficient to extract and store information from business documents, passports etc. OCR is also used for book scanning where it turns raw images into digital text format. The digitization using OCR obviously has widespread advantages like easy storage and manipulation of the text.
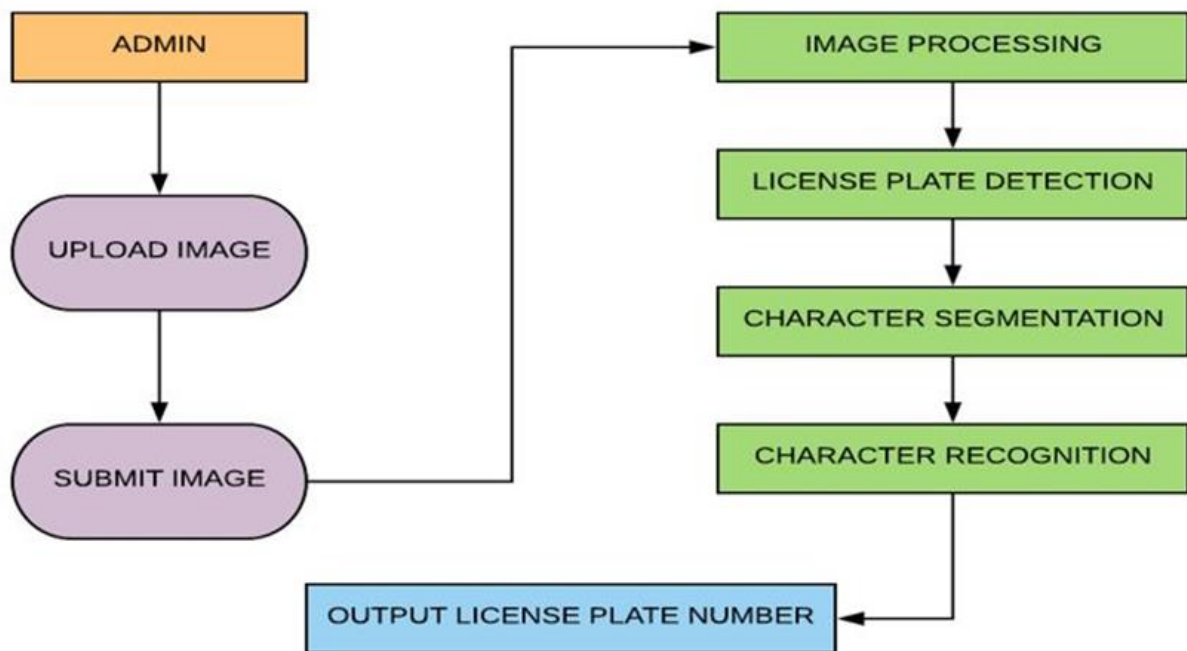
III. FLOWCHART

Fig 2: Flowchart for LPR system

IV. RESULTS AND CONCLUSION

This build model will help for detecting and recognizing the vehicle's number on the number plate. The model will first get images of the vehicle's number plate and then it will pre-process the image using pre-processing algorithms. In the pre-processing part, the obtained image is converted into an RGB image. After pre-processing, the extraction process is performed. The extraction process is performed by using two techniques first is Edge detection and second is Haar-like features. Important data is extracted and the remaining un useful data is removed during extraction. When, the required data is segmented for a accurate view of the data. Now, the Optical Character Recognition (OCR) is performed to convert the text on images into machine-encoded text. The OCR engine will return ASCII to the license number. This system will make use of the Open CV library. In India, there are two forms of license plates are available., white number plate and yellow plate with black and white characters respectively; previous for personal vehicles and therefore later for industrial, public service vehicles. The model tries to
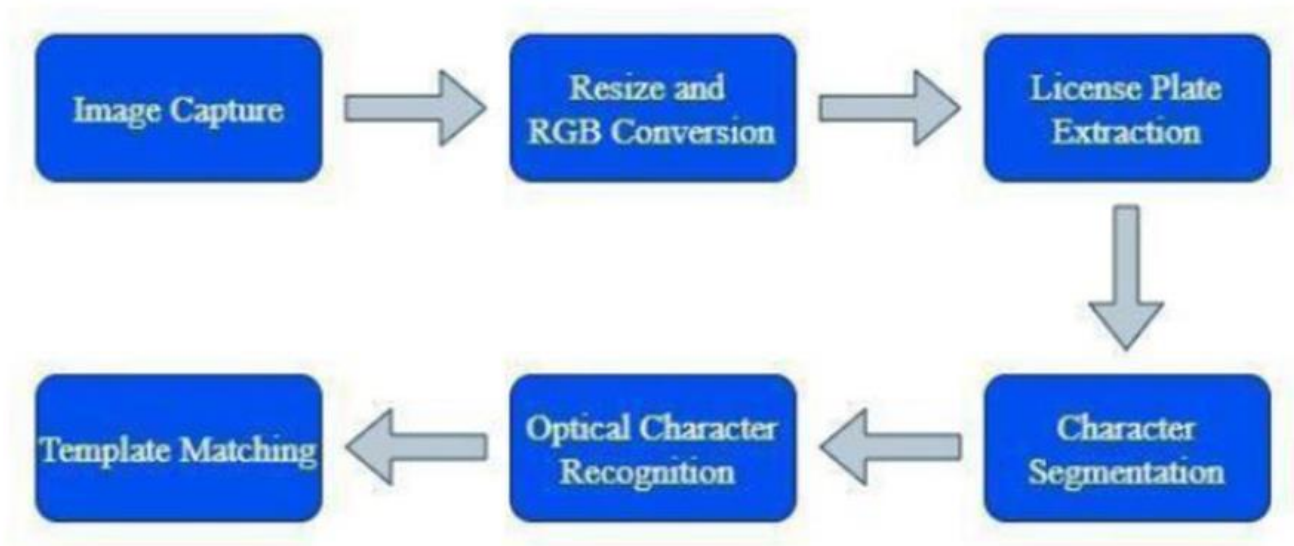
handle these 2 types of plates.

Fig 3: Steps for proposed LPR system

4.1 Input Image

4.2 Output Image

This research paper shows a successful and fast process for detecting multiple license plates. Automatic license plate recognition (ALPR) is used to detect location of the number plate. The advantage of our shown method is that it is highly accurate on multiple plates in the plate detection part. Licenses with complex backgrounds are tracked correctly and get good results. A back image of

a vehicle is collected and processed using various algorithms. After that we are planning to study about the characteristics involved with the automatic number plate system for better result.

4.3 Future Scope And Enhancements

The future scope is that the License plate recognition system plays a important role in recognizing threats to defence. Also, it will improve the security for women's as they can easily detect the number plate before using cab or other services. The system performance will be increase if bright and high-quality camera will use. Government should take some attention in developing this kind of system as this system is money-saving and eco- friendly, if it will apply effectively in different areas.

Advances in ultra-resolution digital cameras, LED illumination, more strong DSPs, faster, low-power, general-purpose processors, and increased network bandwidth have improved ANPR system performance. In Present time, development in vehicle detection and identification have resulted in even better accuracy than previously possible, including full identification of country, state, plate colour and so on. Over the next few years, more cameras will start using onboard DSPs to implement video analytics tailored to improve ANPR performance - from smart exposure control to eliminate motion blur, to real-time skew correction and vehicle detection.

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