Vehicle Number Plate Recognition System

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Abstract — Vehicle number plate recognition plays a significant role in many areas. In this paper, an efficient and an amazingly simple method is used to recognize the number plate. In the proposed method, OpenCV library along with python language is used for image processing using py tesseract. The input image is taken and converted into a grayscale image and the processed image is filtered through a bilateral filter to remove unwanted characters. In this paper, the Canny edge detection method is used to detect the edges of license plates. TESSERACT is used as an Optical Character Recognition (OCR).

Keywords — Vehicle Number Plate Recognition (ANPR), Character Segmentation, Image Segmentation, Number Plate, Optical Character Recognition , Pytesseract and opencv.

I. INTRODUCTION

In last few years, Vehicle Number plate recognition has been one of the useful approaches for vehicle surveillance. It is can be applied at number of public places for fulfilling some of the purposes like traffic In last few years, Vehicle Number plate recognition has been one of the useful approaches for vehicle surveillance. It is can be applied at number of public places for fulfilling some of the purposes like traffic safety enforcement, automatic toll tax collection, car park system, Automatic vehicle parking system. Vehicle Number plate Recognition algorithms are generally divided in four steps:
(1) Vehicle image capture
(2) Number plate detection
(3) Character segmentation
(4) Character recognition.

The first step i.e to capture an image of a vehicle looks very easy but it is quite an exigent task as it is very difficult to capture an image of moving vehicle in real time in such a manner that none of the components of the vehicle, especially the vehicle number plate should be missed. The success of the fourth step depends on how the second and third step are able to locate vehicle number plates and separate each character. These systems follow different approaches to locate vehicle number plates from vehicles and then to extract vehicle numbers from that image.

II. OBJECTIVES

To make of Vehicle management easier. To reduce redundancy and error in number plate recognition. To generate analytical reports based on vehicle recognition. To minimize manpower

required. To enable easier provision of remuneration to number plate detection and logging. Product excellence due to minimum requirements optimized solution increased reliability and faster reaction time compared to human workers compared to human workers. These are the objectives of the proposed system in the project "Vehicle Number Plate Recognition System Using Machine Learning".

III. RELATED WORK AND COMPARISON

challenge. It involves three major steps. They specify number pad space, character segmentation, and character recognition. One of these methods is to deploy the forward background feed method for character classification. The neural network is developed by using the backward-propagation algorithm. Normalization, scale and edge detection are included in the steps of the preprocessing. The horizontal and vertical graph and component survey are able to address the problem of character fragmentation.
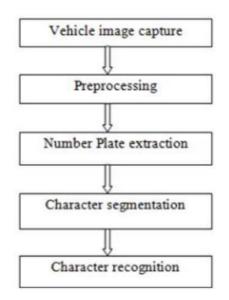
At present, open CV is a great deal with the opensource library for computer vision and has a large community of users. Open CV has much more functionality to see the computer than MATLAB. Many of their functions are performed on the GPU. The library is updated continuously.). In general, the open CV C ++ program can be executed with a higher speed than the MATLAB code. Open CV has more functions to see the computer than MATLAB. Many of their functions are performed on the GPU.MATLAB is a relatively simple language, this high-level programming language has become slower in some cases. In such cases, an open CV works better and produces accurate results. The open CV library contains several algorithms for more than 500 optimized algorithms. Used mostly around the world, with forty thousand people in the user group. Open CV is a multiplatform library, containing C ++, Python, and Java interfaces. Opencv is designed to achieve computational efficiency with a strong focus on real-time applications.

For now, open CV supports many of the improved algorithms for computer vision and automated learning, which are spread daily Open cv currently supports a vast number of programming languages such as C ++, Python, Java and others, and is available on different platforms such as Windows, Linux, OS X, Android, iOS, and so on. Here in this system, we used Python as a code language. It is called opencv Python. We choose the snake because it is easier to understand and more effective. The proposal combines the good qualities in Opencv and Python.

IV. IMPLEMENTATION

As it is shown in Fig., the first step i.e. to capture an image of the vehicle. The success of the fourth step depends on how the second and third step are able to locate the vehicle number plate and separate each character.

A. Vehicle Image Capture

The car's number pad is taken from a high resolution camera. The resolution of the number plate recognition system depends on the captured image. The image captured in RGB format must be converted to a gray image.

B. Preprocessing

Pre-processing is a set of algorithms applied to the image to improve the quality by which the gray image is converted to a binary image. Before converting to a binary image, the image is smoothed to reduce noise. Pre-processing can be done by the threshold algorithm.

C. Number Plate Extraction

The license plate is extracted using either a shape analysis or a color analysis method. The General License Panel has a rectangular shape. Thus, algorithms look for geometrical shapes of a rectangular proportion. In India, most license plates are white or yellow, and therefore can also use color analysis. Before you find the rectangle in an image, the image must be in a binary image or the edges of the image should be detected. Then you should find and connect to the relevant rectangular corners. Finally, the areas connected to the box are connected and all rectangular areas of interest are extracted.

D. Character Segmentation

Once the license plate has been extracted, each character must be fragmented. For component division, the component label is used to see the computer in order to discover the connected areas in binary digital images. The label of connected components works by scanning a pixel-in-pixel image from top to down to find connected pixels and connected pixel cards.

E. Character Recognition

This is the most essential and basic phase of the vehicle number plate recognition system. It displays the techniques that were used to order and then perceive the individual characters. The classification is based on the extracted features. Character recognition is the optical character recognition (OCR) used to look at every individual character against the complete alphanumeric database. The OCR really uses relationship strategy to match individual characters and finally the number is recognized.This is the most essential and basic phase of the vehicle number plate recognition system. It displays the techniques that were used to order and then perceive the individual characters. The classification is based on the extracted features. Character recognition is the optical character recognition (OCR) used to look at every individual character against the complete alphanumeric database. The OCR really uses relationship strategy to match individual characters and finally the number is recognized.

V. CONCLUSION

This program can be used for a variety of works where a license number is the primary way of recognizing a vehicle. the vehicle plate recognition system developed using Python and opencv offers a promising solution for the process of detecting and recognizing license plates from vehicles .through the use of computer vision techniques, the system is able to accurately detect and extract license plate regions from images, and then apply optical character recognition (OCR) algorithms to recognize the characters on the plates.The development process, including image preprocessing techniques such as image resizing, thresholding, and contour detection. This way we successfully recognise the charecter on vehical number plate.

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