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AUTOMATIC NUMBER PLATE RECOGNITION

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ABSTRACT

With the explosive growth in the number of vehicles in use, automatic number plate recognition (ANPR) systems are required for a wide range of tasks such as law enforcement, surveillance, and toll booth operations. The operational specifications of these systems are diverse due to the differences in the intended application. . The proposed syatem is established on computer vision vehicle detection using Open CV Python in Embedded Linux platform. The work is designed by using Intel/AMD processor .In this camera catches picture of vehicles going through toll corner along these lines a vehicle recognized through camera.

1. INTRODUCTION

Automatic Number Plate Recognition has become part of our lives and promises to stay in future, integrable with proposed transportation technologies. The concept of Autonomous Vehicles is offering many possibilities of changing fundamental transportation systems. ANPR technology is already contributing towards intelligent transportation systems and is eliminating the need of human intervention. A Digital Image Processing-based prototype is developed. Actions such as Image Acquisition, enhancement that is pre-processing, Segmentation of the license plate and then application of OCR (Optical Character Recognition) is applied to store the number on text form. The plate number is displayed as text on the terminal using the principal of OCR with help of pytesseract and Tesseract engine. It is seen that the security forces and authorities face problems whenever security forces chase a vehicle or they can't catch a vehicle which broke traffic rules. Authorities find it very hectic on a busy day to log the vehicle numbers manually in a parking lot. So, in order to make the entire process autonomous, we can install this system so as to automatically detect the vehicle which breaks the traffic rules, take a picture of it and store the number in the database so as to fine the respective owner afterwards. The system can be used in parking so as to take the picture of the vehicle and log the vehicle number in the database (or the cloud, if connected to the internet). This technology reduces the unnecessary hectic manual work required on any busy day, saves the labour cost and is far more efficient than humans. The number of any vehicle once obtained as text, can be displayed, saved in the database or can be searched through the entire database for the details. This proposed system is so versatile that it can be used as an entire application once converted to a software or can be used as a part of any big project. Generally, an ANPR system takes an image or a video stream as the input to the system and, if the given frame contains a vehicle it outputs the content of the license plate, usually as a text. These systems consist of a camera to capture the images of the vehicles. Those images can be either colour, black and white, or infrared depending on the requirements for the system. ANPR algorithms are generally divided in four steps: (1) Vehicle image capture (2) Number plate detection (3) Character segmentation and (4) Character recognition. Presently number plate detection and recognition processing time is less than 50 ms in many systems. The success of fourth step depends on how second and third step are able to locate vehicle number plate and separate each character. These systems follow different approaches to locate vehicle number plate from vehicle and then to extract vehicle number from that image.

2. TECHNOLOGY

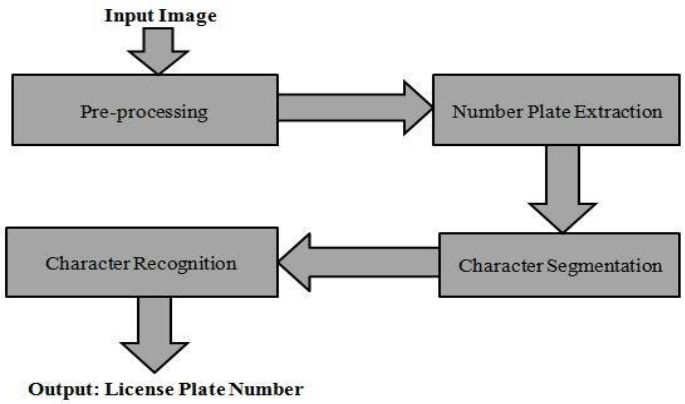

Figure 1: Block Diagram of ANPR.

Most of the number plate algorithms fall in more than one category based on different techniques. In this system it is a combination of EasyOCR with Tensorflow model to detect License/Number Plate in real time. With the help of EasyOCR and Tensorflow model vehicle Number plate can be easily identifies.

Captuere the input image:

Number Plate with acceptable resolution 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.

Pre-processing:

The purpose of pre-processing is to improve the quality of image data by suppressing unnecessary distortion or enhancing image functions that are important for further processing. As a result, distorted pixels can usually return to the averageof adjacent pixels. The image pixel values are converted to 416 416 sized gray images and fed into the neural networks.This procedure is done to avoid the unnecessary density of neural networks.

Number plate localization:

The license plate is extracted using either a shape analysis or a color analysis method. In the General License Panel has in form of 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.

Connect component analysis:

To remove the unwanted image space, the algorithm of the component connected to the binary filter is applied first. The parsing of the connected component is done to determine the characters in the image. The basic proposal is to pass through the image and find a connected pixel. Each component (dots) is distinguished and extracted.

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.

Character recognition:

To identify characters, the segmented characters in the license panel must match the templates that are already created. The recognition process returns the license number in ASCII format and saves it in a text document. In this recognition is a two-track process. In the first pass, an attempt was made to identify each word in turn. Each satisfactory word is passed to the adaptive workbook as training data. The adaptive workbook gets an opportunity to learn the text more accurately.

3. ADVANTAGES

- Improving road safety
- Reduces crime
- Gives officers better information to work
- Giving a greater police presence

4. APPLICATIONS

- Traffic control
- Parking
- Access control
- Motorway road tolling
- Border control.

5. CONCLUSION

The development of the vehicle plate recognition system shows how the use of the Open CV and OCR can be applied in the character extraction and recognition of vehicle plates. In order to improve the design efficiency, other forms of character extraction and recognition technologies will be

examined. Automatic number plate recognition (ANPR) is a mass surveillance method that uses optical character recognition on images to read the licence plates on vehicles.

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