

UNREGISTERED VEHICLE RECOGNITION BASED ON NUMBER PLATE USING RASPBERRY PI

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ABSTRACT

The automatic object detection algorithm is really important component in the smart cities application to process the digitized images searching vehicle license plate. It consists of a raspberry pi as a processing unit which has an USB camera attached to detect the amount plates in traffic signals and the image processing technology performs enhancement and extracts the required information from a given image frame. Extracted vehicle information is contrasted with existing database, if it does not goes with registered list it sends a mail and image of vehicle to the control station through mail.

Keywords: Automated object detection algorithm, Raspberry pi, Image processing technology, Control station.

I. INTRODUCTION

The self-operating object detection algorithm is really important component in the smart cities application .In metropolitan surveillance application the image camera plays a crucial role in unravel the scene or environment. To process the digitized images checking out a specific object may be a huge task because it will need a high CPU and memory power. The Image processing technology to capture a vehicle plate within a given image frame is a crucial task. In this project we are deploying Raspberry pi as a processing unit to detect the vehicle plates in stoplights. USB camera that is attached with raspberry pi spots number plates of each vehicle and extracts the numbers using OCR algorithm. Extracted vehicle numbers are analysed with existing database, if the numbers are not in registered list it sends the amount and image of auto to the control station through mail. Using this technique , we will prevent unauthorized activities using unregistered or fake numbered vehicles. It's a take the bull by the horns efficient and closed-circuit television in comparison to present systems are used.

II. METHODOLOGY

This system proposes a concise and mobile model to acknowledge the information of vehicle plate. It'll extract the numbers from the detected number plates using OCR algorithm and compare the extracted numbers with existing database all the vehicle numbers.

EXISTING SYSTEM

It uses machine learning based approach called cascade classifier to classify sign-posts in roadside. This system cannot give high veracity in active environments. For papers published in translation journals, please give English citation first, followed by the first foreign-language citation. Baoguang Shi, Xiang Bai and Cong Yao-The problem of scene text recognition, which is among the foremost important and challenging tasks in image-based sequence recognition. . Jiangmin Tian, Guoyou Wang. The main disadvantage is the variation of background, illumination, and view point, license plate detection in an open environment is challenging. It is too time consuming for application with time requirement. Hui Li, Peng Wangy, and Chunhua Shen-It does not explicitly handle the rotated plates. Edge-based methods are fast in computation, but they can't be applied to complex images as they are too sensitive to unwanted edges. Chao Gou, KunfengWang, Yanjie Yao, and Zhengxi Li-This may become invalid when there are regions in the image whose color information is similar to that of the license plate.It can easily be suffering from noises and are computationally complex when there are many edges within the image Annie J. Zenath M.S, S. Shriram- If the training time is an predominant factor then the network having single hidden layer. The template matching has its drawbacks in some aspects comparing with neural networks.

D. F. Llorca, C. Salinas, M. Jim´enez, I. Parra, A. G. Morcillo, R. Izquierdo, J. Lorenzo, M. A. Sotelo-It provides the minimum speed error. Jaderberg1 · Karen Simonyan1 Andrea Vedaldi1-This places text spotting as a separate, far more challenging problem than document OCR.This places text recognizing as a separate, much more challenging problem than document OCR.This model was extended to CAPTCHA up to eight characters long where they demonstrated attractive performance using synthetic training data for a man-made problem. -Zied Selmi, Mohamed Ben Halima-Some frameworks require complicated hardware to make good quality images or capture images from vehicles with very slow speed. Detection and recognition of LPs in different conditions and under several climatic variations remains always difficult to realize with good results Minghui Liao_, Baoguang Shi_, Xiang Baiy, Xinggang Wang, Wenyu- due to the inevitable challenges and complexities, traditional text detection methods tend to involve multiple processing steps.TextBoxes directly outputs the coordinates of word bounZhenbo Xu- An imperfect bounding box prediction given by detection methods might make a neighborhood of the LP missing, and thus leads to the next recognition failure. Operations between different stages like extracting and resizing the LP region for recognition are always accomplished by less efficient CPU, making LP recognition slower. ding boxes at multiple network layers by jointly predicting text presence and coordinate offsets to default boxes.

PROPOSED SYSTEM

This system proposes a reliable model to acknowledge the quantity plate of the vehicle. It concentrates the numbers from the detected number plates using OCR algorithm and compare the extracted numbers with existing database which contains all vehicle numbers. Raspberry Pi is connected with camera. Camera captures the frames ceaselessly. Once the image is read in python the image is converted to grey scale image.This means the pixel value will be stripped off the color values and converted to the grayscale. The grayscale image is then processed to find out possible number plate area using edge detection technique. After edge detection, all high intensity pixels were scanned from left to right within the X axis and top to bottom for Y axis. The concentration of white pixels will provides a good knowledge of where the more number of edges were available in x-axis. this may give the approximate starting location of x-axis. Concentration of white pixels in y-axis is additionally scanned to urge the approximate location of the y-axis. thanks to the variable text or images available within the vehicle, we may have quite one region of interest of the quantity plate. The region of interest for the quantity plate area was detected from the previous module. we'll plan to fit the quantity plate area and ratio of width and height. If the possible number plates region is identified, the image is cropped for the dimension of the detected number plate. the amount plate image is then processed with simple optical character recognition software to convert to a text. The extracted text is compared with existing database content. If the amount isn't within the database it'll send the image and number of auto to the control station .



Fig:1.1

III. MODELING AND ANALYSIS

BLOCK DESCRIPTION

This technique proposes a compact and portable model to acknowledge the quantity plate of the vehicle. it'll extract the numbers from the detected number plates using OCR algorithm and compare the extracted numbers with existing database which contains all registered vehicle numbers. during this diagram , Raspberry Pi is

connected with camera. Camera captures the all frames continuously. Once the image is read in python the image is converted to grey scale image. this suggests the pixel value are going to be stripped off the colour values and converted to the grayscale. The grayscale image is then processed to seek out possible number plate area using edge detection technique. After edge detection, all high intensity pixels were scanned from left to right within the X axis and top to bottom for Y axis. The concentration 1of white pixels will provides a good knowledge of where the more number of edges were available in x-axis. this may give the approximate starting location of x-axis. Concentration of white pixels in y-axis is additionally scanned to urge the approximate location of the y-axis. thanks to the variable text or images available within the vehicle, we may have quite one region of interest of the quantity plate. The region of interest for the quantity plate area was detected from the previous module. we'll plan to fit the quantity plate area and ratio of width and height. If the possible number plates region is identified, the image is cropped for the dimension of the detected number plate. the amount plate image is then processed with simple optical character recognition software to convert to a text. The extracted text is compared with existing database content. If the amount isn't within the database it'll send the image and number of auto to the control station

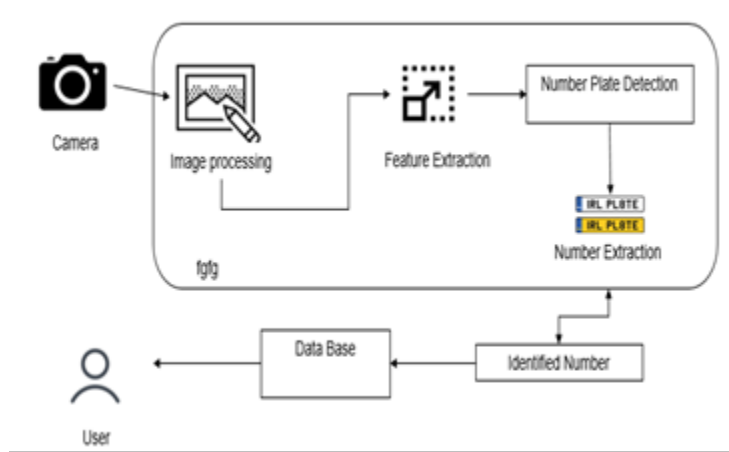


Fig:1.2

IMAGE PROCESSING

It consists of surveillance camera connected to a raspberry pi through pi which performs image processing that's captures the image of vehicles and recognizes their license number . Image processing could even be how to perform some operations on a picture , so on urge an enhanced image or to extract some useful information from it. it is a kind of signal processing during which input could also be an image and output could even be image or characteristics/features related to this image. Nowadays, image processing is one of the rapidly growing technologies. It has been the core research area within engineering and computing departments too. .

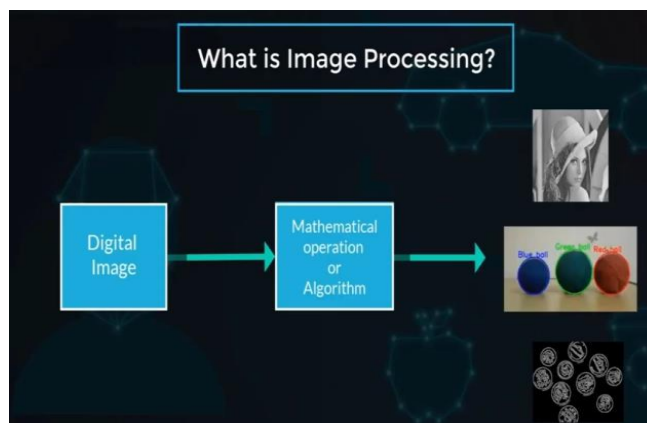


Fig:1.3

NUMBER PLATE DETECTION

Once the image is read in python the image is converted to grey scale image. This means the pixel value will be stripped off the color values and converted to the black and white. The black and white image is then processed to find out possible number plate area using edge detection technique. After EDGE DETECTION, all high intensity pixels were scanned from left to right in the X axis and top to bottom for Y axis. The concentration of less density pixels will provide a fair knowledge of where lot of edges were available in x-axis. It gives the approximate starting location of x-axis. Concentration of less density pixels in y-axis is additionally scanned to give the approximate location of the y-axis. Due to the variable text or images available within the vehicle, we may have quite one region of interest of the amount plate.

EDGE DETECTION TECHNIQUE

Edge detection is a picture processing technique for locating the boundaries of objects within images. It works by detecting discontinuities in brightness. Most of the form information of a picture is enclosed in edges. So first we detect these edges in a picture and by using the different pixel ranges then by enhancing those areas of image which contains edges, sharpness of the image will increase and image will become clearer.



Fig:1.4

NUMBER EXTRACTION

After the USB camera captures the number plate it recognizes and extracts the number through OCR algorithm. This is developed on the basis of general features of both, characters and number plate

Optical character recognition algorithm

Optical character recognition involves the electronic or mechanical conversion of images of any form of text such as typed, handwritten, whether from a scanned or photographed of a document. This algorithm detects specific portions or shapes of a digitized image or video stream. OCR software often pre-processes images to improve the chances of successful recognition. In this way, unwanted distortions are suppressed and specific image features are enhanced.



Fig:1.5

IV. CONCLUSION

Thus in the unregistered vehicle recognition using raspberry pi we have overcome all the drawbacks till date. We have used the simplest algorithms and have reduced the time of the output. Our system also adapts to all the climatic conditions. Using this system, we can prevent illegal activities. It is cost efficient. This system is handy and movable model. [1]

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