A vehicle License Plate Detection And Recognition Using Raspberry Pi

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Abstract

The main of this paper is to develop a completely license plate recognition and detection system using Raspberry processor. The OCR (Optical Character Recognition) which is used to read information on the image of number plate vehicle. The camera capture the image of the number plate and passed to the Raspberry processor. The Raspberry Pi which is used for authentication purpose.

Keywords OCR(Optical Character Recognition), Raspberry Pi, License plate number recognition, character segmentation:

1. Introduction

The major problem faced on the road that is in day to day increased vehicle population on the road. This strategy is however stressful and laborious because of the valuable time spend in a traffic; so this problem cannot sort out manually. There arises a need for a more efficient and effective method of solving this problem.

The paper aim is going to solve of these problem by using raspberry pi 3 model. The Raspberry Pi is a credit-card-sized single-board computer developed in the UK by the Raspberry Pi Foundation with the intention of promoting the teaching of basic computer science in schools. The Raspberry Pi is manufactured through licensed manufacturing deals with Newark element 14 The hardware is the same across all manufacturers. The Raspberry Pi has a Broadcom BCM2835 system on a chip (SOC), which includes an ARM1176JZF-S 700 MHz processor (The firmware includes a number of "Turbo" modes so that the user can attempt over clocking, up to 1 GHz, without affecting the warranty), Video Core IV GPU, and was originally shipped with 256 megabytes of RAM, later upgraded to 512 MB. It does not include a built-in hard disk or solid-state drive, but uses an SD card for booting and long term storage.

2. Design And Implementation

The basic block of License plate recognition using Raspberry Pi as shown in fig 1 In this paper two technologies are used to easily identify vehicles license plate by their number plates
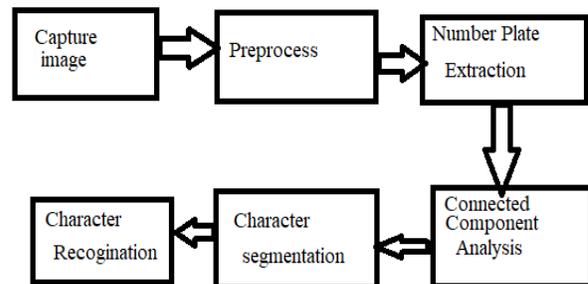1. Image processing.
2..character recognition

Fig 1 functional Block Diagram

Step 1] Image Acquisition:

The analog or digital camera can be used to capture different types of images and this images are used as input to the system.

Step 2] Plate extraction:

For license plate region extraction, the character region is first recognized by identifying the character width and difference between the background region and the region. The license plate region is then extracted by finding the inter-character distance in the plate region. In addition, the license plate type is identified by the difference in the gray-level value between the background region and character region.

Step 3] Character segmentation:

In this segmentation part additional image processing is compete on extracted license plate to dislimn unwanted data. After character segmentation, the extracted license plate has only those characters that belong license number.
This segmentation is also accomplished with the width height ratio matching with the contours detected on extracted number plate.

Step4] Character recognition:

The completed segmentation of characters the last parameter in the license plate process is character recognition. In the character recognition different types of techniques are available like statistical, syntactic and neural network. The character recognition is performed by using feature extraction.

Raspberry pi is an credit card sized single board computer Raspberry pi has total 40 pins in which 27 pins is of GPIO (General purpose input and output) and remaining 13 pins are used for VCC and GND. Video Core IV GPU and 1GB RAM. It is the minicomputer which it has inbuilt operating system, but it requires inbuilt SD card for booting and long term storage. The camera capture the image automatically of the number plate and is passed to the Raspberry Pi with the help of USB cable. The image is verified by using Raspberry Pi . After the recognition if the user is authorized then it will be display the name user otherwise it will display user is unauthorized. Schematic block diagram shows above.
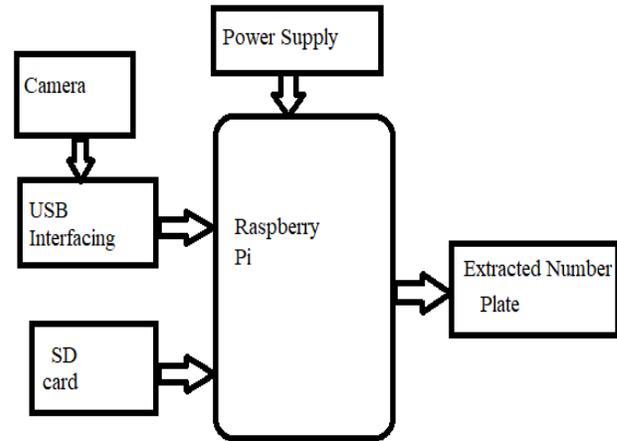

Fig 2 Functional Block Diagram

4. Conclusions

The This paper is helpful for the recognition and detection of vehicle number plate. The capture image of an camera is passed to the raspberry pi processor for authentication purpose In this paper OCR processor performed main role which is recognized the character of image. In future, if you store the data permanently then it will be used cloud memory.

Appendix
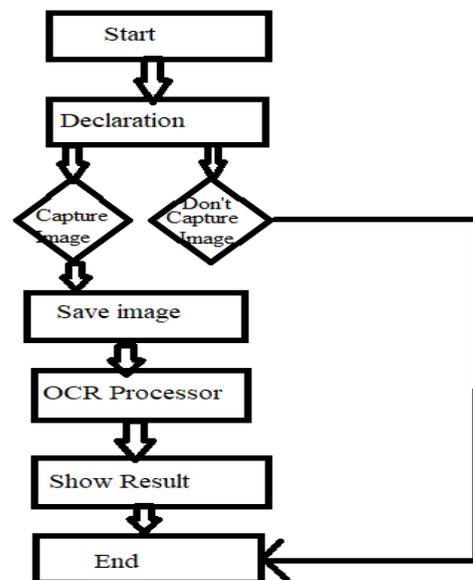
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