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A Novel Approach to Vehicle Number Identification using Raspberry pi 3

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ABSTRACT

Vehicle Number Identification using Raspberry pi 3 is an image conversion technology which captures the license plate of a vehicle. The main aim is to make an effective and accurate license number plate identification system. This system is carried out and performed in the areas where traffic signals are present and the camera is placed on the signal which is connected to raspberry pi and it sends signals to the server and it can also be used in apartments or residencies for capturing all the vehicle numbers entering the building. This system at first detects the vehicle license plate and then captures it .It then converts the image into the text. The text of the license plate is displayed on the screen using the image conversion. Open CV and OCR are the two software's used for image capturing and conversion of that into text format respectively. The resulting data is then displayed on the screen and saved into a folder. The whole system is developed on Raspberry Pi desktop and its performance is used in real-time. It is observed from this experiment that the system mainly detects and captures the vehicle license plate, converts the image into text and displays it on the screen successfully.

Keywords : Vehicle Number Identification, Raspberry pi 3, Open CV, OCR, GPIO

I. INTRODUCTION

Automation is the most frequently used technical term in our generation. IOT is a part of our life now. Due to automation and IOT, revolution has occurred in the existing technologies. IOT is used everywhere from houses to industries .This project needs an onboard computer, which is Raspberry Pi 3 processor or desktop. It's the backbone of the project. This can effectively connect all the output and input modules. Raspberry Pi is a low cost, small computer in the size of a card that plugs into electronics like computers and TV and uses a mouse and keyboard.. Basically, the OS used for the detection of vehicle number plate using Raspberry pi 3 is the Raspbian Stretch. For the recognition purpose, Raspberry pi model 3 is used. The overall average power is ranging from 1.5 to 6.7 watt. Raspberry pi has 40 digital input output pins in which 27 pins are GPIO (General Purpose Input Output). It has OS which is installed in external SD card which can be attached to raspberry pi in the given SD card slot for initializing and storage. Here in this system raspberry pi is the backbone of the project. In many industries unknown vehicles are not allowed. There security is very important for them our system is going help to recognize number unknown vehicle on gate. This system can be mainly used in areas where security is the important. The detection of vehicle license plate works in four steps. The first one is capturing the image, second is license number extraction, third one is image conversion, and last one is text generation. OCR is the software which converts any image into text.

II. LITERATURE SURVEY

The main purpose of this project is to read the text and numbers on the license plate of vehicle and capture the image by camera automatically with the help of raspberry pi. For this project, open CV and OCR(optical character recognition) applications are used. After capturing the required image it converts the image into characters and displays those characters. Vehicle number Identification system, detecting and recognizing the characters in the vehicle number plate and classified characters are used further use in much traffic, security, access control applications. Car plate recognition has complexity features due to diverse effects like light and speed. Most commonly LPR, which comes under image processing, uses proprietary tools like python and open CV.

The main aim of the paper is to design a system which can capture the image of the vehicle which focuses on its license plate . The details of the vehicle can be verified and authenticated using this Raspberry Pi. With the help of this system we can also alert the higher authorities whenever a breach is detected in the system. Automation is one of the most used term in our generation. The demand for automation in the present technologies brought many revolutions. The system makes use of an compact onboard computer, which is also known as Raspberry Pi processor. It acts as the backbone of this project. This significantly compact onboard computer can efficiently communicate with the output and input modules which are being used with the help of the Linux. The Raspberry Pi is a small computer in the size of a card used for programming and connecting several devices at once, developed in England by the Raspberry Pi Foundation. The device which has the ability to perform a task is a processor of the Raspberry Pi. When a vehicle passes by, it captures the image of the number plate with the help of a camera. The image which is captured of the number plate will be the input to the Raspberry Pi processor. The processor converts image into a text format by using Open CV and OCR . It displays the converted text on our screen which we can save if required.

III. METHODOLOGY

The main objective of this project is Usage of image conversion technology, capturing the Vehicle license plate using a camera, number plate recognition indication. Fig. 1 Vehicle number identification system block diagram using Raspberry pi .In this Raspberry pi is the backbone of project and for this we need Raspbian Stretch which acts as a operating system for raspberry pi and some important packages have installed to convert the captured image to text like open CV & OCR. Raspberry pi is an electronic device.

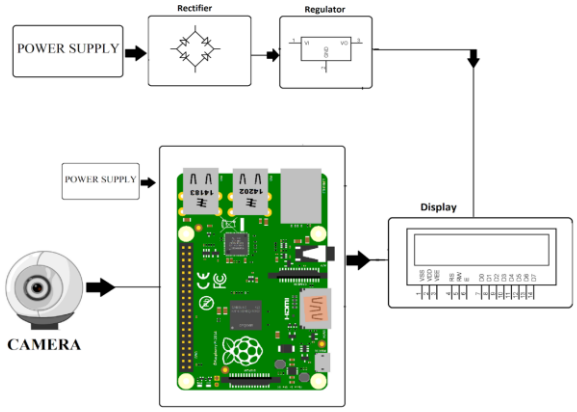

Fig. 1 Block Diagram of the System

Fig. 2 Login to Remote desktop Connection. Here we login to get connected to the Remote Desktop of Raspberry Pi. Fig:3 Desktop of Raspberry Pi. This is the Raspbian environment Operating System of raspberry pi. Here we connect a camera to the Raspberry pi on a port.. The camera plays main role in this system. Fig. 4 Recognition of vehicle number plate. Here the computer recognizes the number plate. Fig. 6 Conversion of image into text. When vehicle is identified image of number plate gets captured and converts into text using software's like

OCR and Open CV. Then compare the text into existing number plate and then it displays it on the screen. This is highly useful in case of security issues.

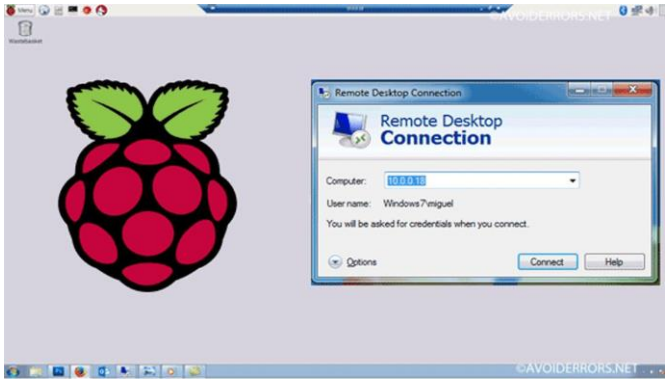

Fig. 2 Login page of the System

Fig. 3 Image of Vehicle

Fig. 4 Recognition of number plate

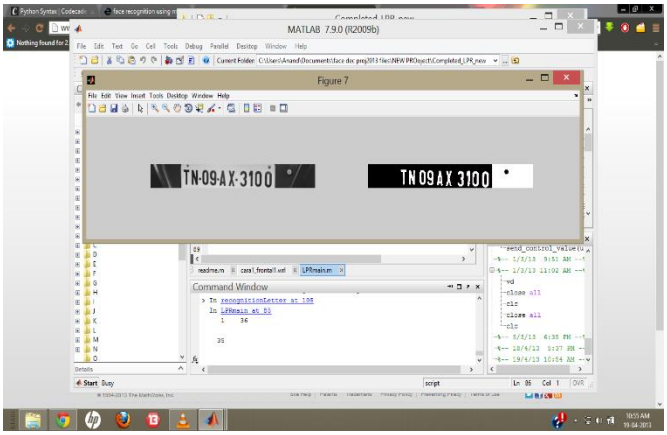

Fig. 6 Conversion of the Name plate

Fig. 6 Final output of the System

IV. CONCLUSION

Basically our project is to identify a vehicle number plate using raspberry pi. The project runs with the help of raspberry pi & IOT. This application makes it easy to capture a number plate and convert it from pixel format to text format with the help of software's like OPEN CV and OCR. By our project we can easily convert pixel format number plate to text .It provides a way to identify the number plate. The whole system is developed on Raspberry Pi desktop and its performance is used in real-time. It is observed from this experiment that the system mainly detects and captures the vehicle license plate, converts the image into text and displays it on the screen successfully.

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