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Vehicle Number Plate Reorganization by using General Surveillance Camera

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ABSTRACT: Vehicle number plate recognition (VNPR) is a type of image processing that uses a vehicle's number plate to recognize it. The goal is to create a system that uses the car number plate to create an efficient automatic authorised vehicle identification system. The system is installed at the entrance to a highly restricted zone, such as military zones or the area surrounding major government facilities, such as Parliament and the Supreme Court. The devised technology initially detects the car before taking a picture of it. The image segmentation in an image is used to obtain the vehicle number plate region. Character recognition is done using an optical character recognition approach. The collected data is then compared to records in a database to produce precise information such as the vehicle's owner's name, email address, and so on. I constructed and simulated the system in Android, and it was tested on a real image. According to the results of the experiment, the built system works well.

KEYWORDS: Advance Development Kit, Software Development Kit, Graphical User Interface, Integrated Development Environment.

I. INTRODUCTION

Vehicle number plate recognition (VNPR) is a type of image processing that uses a vehicle's number plate to identify it. The goal is to create a system that uses the car number plate to create an efficient automatic allowed vehicle identification system. The system is installed at the entry to a highly restricted region, such as military zones or areas surrounding major government facilities, such as Parliament and the Supreme Court. Every man can benefit from this approach in terms of security. An Android application will be put on the phones of the general public. After that, if he wants to learn more about a vehicle, all he has to do is take a picture of the license plate, which will be analyzed and he will have the information he needs. This system is critical and must be implemented. The developed system detects the vehicle initially and then takes the vehicle image for defence purpose.

II. RELATED WORK

1. Proposed a simple method for segmenting all of the letters and numerals on a number plate. We primarily focus on two steps: locating the number plate and segmenting all of the numbers and letters to identify each number independently.
2. Used English characters to complete the number plate extraction, character segmentation, and recognition operations. Connected component and vertical projection analysis are used to segment characters.
3. Implemented that the Vehicle Number Plate Recognition (VNPR) system is an image processing technique which uses computer vision to recognize vehicles by tracking their license plate numbers without requiring direct human participation.VNPR is a critical component of the Intelligent Transportation System (ITS). They concluded that their proposed VNPR method performs efficiently in low-contrast situations.
4. Demonstrated a system for recognizing numbers from number plates on the front and back of a vehicle. The system's input is a digital camera image sequence of a plate number, and the system's output is the recognition of characters on the number plate.
5. Presented a solution to the problem of parking lot toll collection. They suggest a method that will automatically capture the vehicle's image because human participation makes the system prone to errors and wasteful.

III. PROPOSED WORK

SOFTWARE PART :
A typical LPR algorithm is mainly composed of three sequential processing parts: (a) Image acquisition, (b) LP Detection (c) character segmentation (d) character recognition
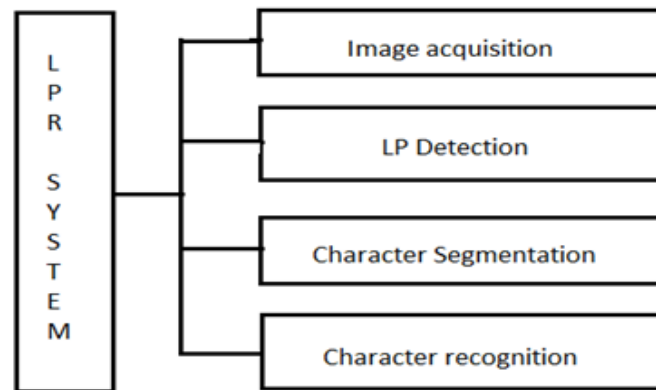
Fig1. flowchart of LPR Algorithm

1. The initial stage in every image processing system is image acquisition. The goal of any image acquisition is to convert an optical image (real-world data) into a numerical data array that can then be edited. Mobile cameras are used to capture images.
2. Number plate detection is a system that analyses vehicle registration plates to determine vehicle position data. It recognizes a portion of the car number plate with similar structures to select a place for the next frame. The following frame aligns the previous frame's detection region with the vehicle's observed area.
3. It is one of the most crucial procedures in vehicle number plate identification because it lays the
4. foundation for all subsequent steps. A character can be erroneously separated into two pieces or two characters can be wrongly merged together if segmentation fails. For segmentation, we can utilise a horizontal projection of a number plate or one of the more complex methods, such as neural network segmentation. We employ two forms of segmentation in this segmentation: Horizontal segmentation is the first step in the process. Vertical segmentation is the second step. The number plate was vertically segmented first, and then the characters were vertically segmented. We must execute horizontal segmentation after performing vertical segmentation in order to obtain character from the plate.
5. To detect the characters, we must do feature extraction, which is the essential principle for character recognition. The feature extraction procedure involves converting data from a bitmap representation to descriptors, which are more computer-friendly. Character recognition should be invariant to the user's font type, as well as skew deformations. Furthermore, all instances of the same character should have a description that is similar. A character's description is a vector of data variables known as descriptors or patterns.

2. HARDWARE PART :
The ESP8266 is a single-chip system (SoC). A 32-bit microcontroller unit (MCU) and a Wi-Fi transceiver make up the device. There are General Purpose Input/Output pins as well as an analogue input. This means you may programme it in the same way you would any other Arduino or microcontroller. You also receive Wi-Fi communication, which allows you to connect to your Wi-Fi network, connect to the Internet, host a web server with genuine web pages, and link your smartphone to it.
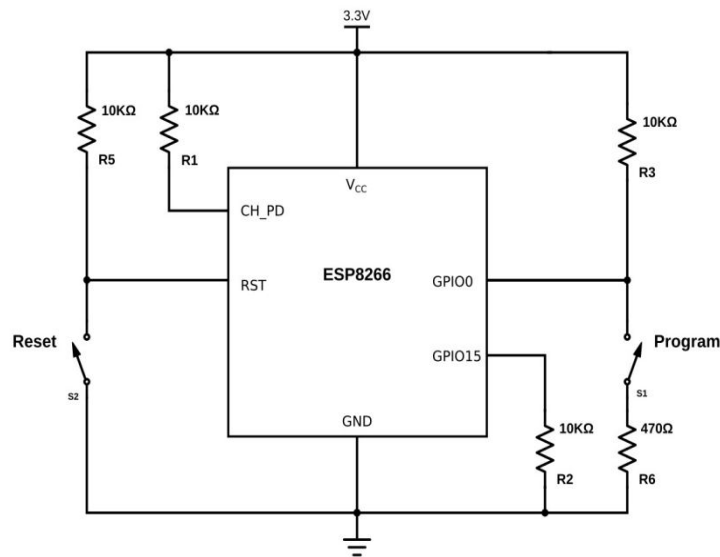
Fig2. Circuit Diagram of EPS82666

Connection of Power Supply:
1. Connect the regulator's first pin to ground.
2. Connect pin 2 (Vout) to ground with a 10F capacitor.
3. Connect pin 3 (Vin) to ground with a 10F capacitor.
4. Connect pin 2 to the ESP8266's 3.3V or VCC.
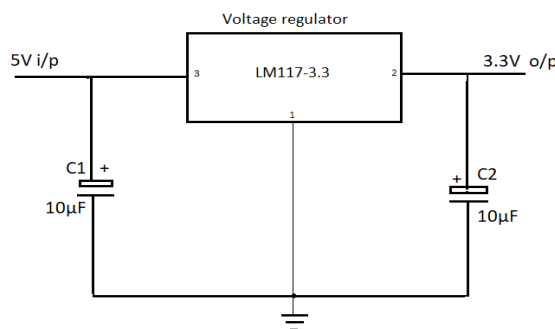5. Connect pin 3 to a 5V power source, such as a USB port.

Fig3. 3.3V voltage regulator

When operating an ESP8266, the most important thing to remember is that it works on 3.3V, therefore connecting it to a 5V power supply will cause it to overheat. The ESP8266's I/O pins are not 5V tolerant, unlike certain 3.3V Arduino boards, thus if you use a 5V USB-to-Serial converter or 5V sensors, you'll blow it up.

Another thing to keep in mind is that the ESP8266 can only source or sink 12mA per output pin, whereas most Arduino's can source or sink 20-40mA.

The ESP8266 contains one analogue to digital converter, but it has an odd voltage range: 0 - 1V, with voltages above 1V potentially damaging the board.

ESP8266 Wi-Fi Module:

The ESP8266 is known as an Access Point because it develops its own Wi-Fi network and works as a hub (equivalent to a Wi-Fi router) for one or more stations (AP).In AP mode, the ESP8266 creates a new Wi-Fi network and assigns it

an SSID (Network Name), password, and IP address.The router/smartphones serves as an access point, whereas the ESP8266 serves as a station in this instance. To control the ESP8266, you must be linked to your router/smartphones.
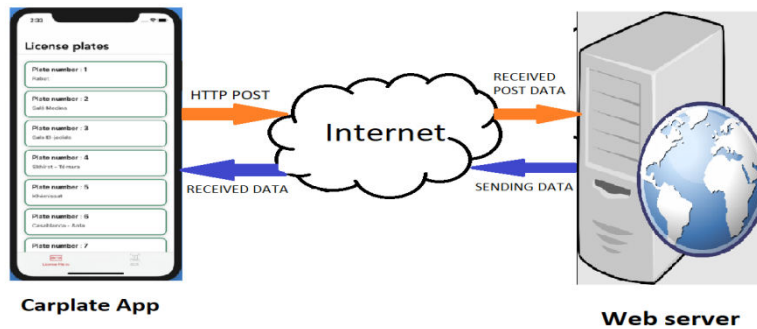

Fig4. Connection of Web Server and Web Client

Web servers:
A web server is a device that connects to the Internet and stores and serves files. Clients can request this file or another piece of data, and the server will respond with the appropriate data/files. HTTP is used to send requests.

HTTP:
The Hypertext Transfer Protocol, or HTTP, is a text-based protocol for communicating with web servers. Although there are several HTTP request methods, I'll only discuss the two most common ones: GET and POST.

HTTP GET:
GET requests are used to get data from a server. It shouldn't update anything on the server; it should merely retrieve the data without causing any problems.

IV. WORKING OF CARPLATE APPLICATION

All of the application pages are depicted in the figures below. The application's flash screen is shown in Figure 5, which implies that when we open the programme, this UI appears. Following that, fig. 6 depicts the application's main screen, where we can view the application's operational tools, such as Detect car, Manage car, View history, and Log out.
Figure 7 depicts all previous records for each car, including the owner's name and license plate number. Figure 8 depicts the entering information, which includes the car number, owner's name, and email address. Figure 9 depicts the history of a vehicle that has passed through the gate or has been detected.

Fig5. UI of carplate application

V.RESULTS

Fig.6: Dashboard of application

Fig.7: Stored data in application

Fig.8: Entering information of new car
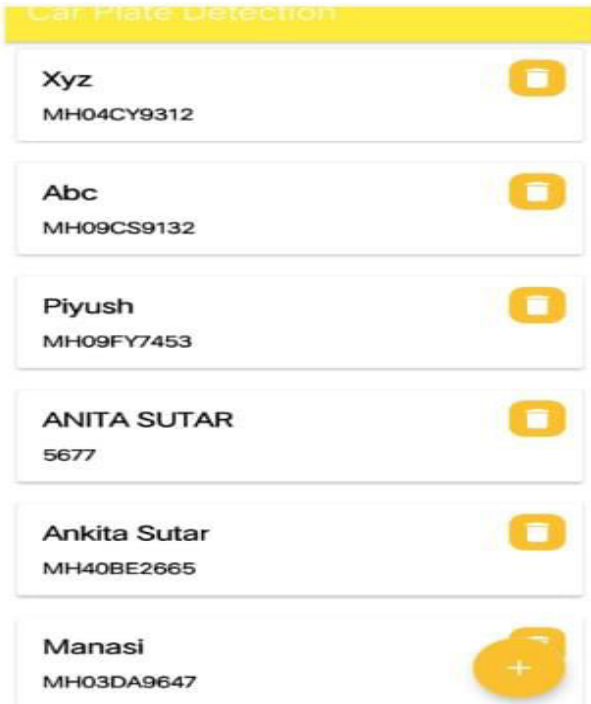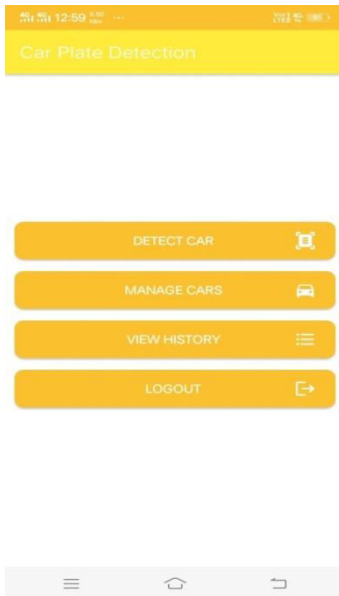

Fig.9: History

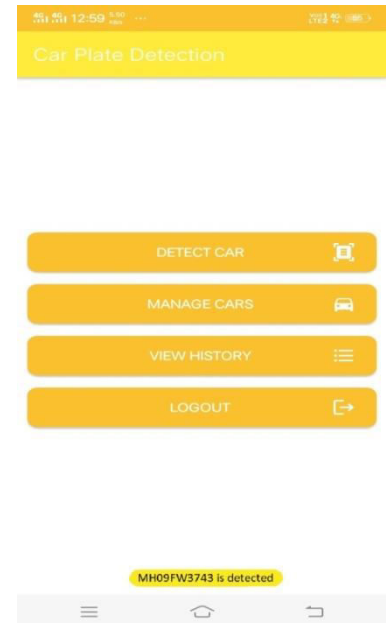Fig.10: Dashboard   Fig.10: taking picture of number plate   Fig.11: showing the result of Detected car

By using the camera we can taking a picture of the number plate. recognize the number of the vehicle by using the LPR system . After that this number we can cross check with the number which already stored in database. If the number is stored in database then it will shows the results i.e. number us detected.

V. CONCLUSION AND FUTURE WORK

The design and implementation of vehicle number plate recognition (VNPR) on the Android mobile phone platform has been covered in general in this paper. In the future, the suggested system could be altered to include transnational automobile vehicle number plates. This VNPR algorithm has been tested on a wide range of pictures and has shown to be extremely accurate.

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BIOGRAPHY

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