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Automatic Number Plate Recognition using Android application

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ABSTRACT: This paper entitled, Automatic Number Plate Recognition using Android application is going to be implemented because currently there is no image processing tool available on the standard Android mobile phone. So, ANPR using Android application provides many advantages such as higher recognition accuracy, less resource consumption, and less computational complexity. In previous researches, many researchers have used a high end desktop PC and high resolution camera to implement the ANPR[1] system. In this project, the optimization of ANPR algorithm on limited hardware of Android mobile phone is presented. The optimization on ANPR was performed as currently there is no image processing tool available on the standard Android[1][3] mobile phone. By optimization of ANPR, many advantages could be achieved, such as higher recognition accuracy, less resource consumption, and less computational complexity.

KEYWORDS: Automatic Number Plate Recognition (ANPR), Automatic License Plate Recognition (ALPR), Image Acquisition, Character segmentation, Android

I. INTRODUCTION

In recent years, Android platform has gained popularity in terms of market share and number of available applications. Massive integration of information technologies into all aspects of modern life caused demand for processing vehicles as conceptual resources in information systems. Because a standalone information system without any data has no sense, there was also a need to transform information about vehicles between the reality and information systems. This can be achieved by a human agent, or by special intelligent equipment which is able to recognize vehicles by their number plates in a real environment and reflect it into conceptual resources. Because of those reasons, various recognition techniques have been proposed and implemented.

Automatic number plate recognition using android application is going to be implemented because currently there is no image processing tool available on the standard android mobile phone. So, ANPR Using android application provides many advantages such as higher recognition accuracy, less resource consumption and less computational complexity.

Automatic Number Plate Recognition (ANPR) is simply the combination[1][2] of hardware and software which have the ability to read the character and number on the vehicle's license plate. Commonly, the ANPR systems are used in various access control and traffic law enforcement, namely toll gate access, parking area access, speed trap and traffic light trespassing.

Automatic number plate recognition (ANPR) is an image processing technology which uses number plate to identify the vehicle. The objective is to design an efficient automatic authorized vehicle identification system by using the vehicle number plate. The system is implemented on the entrance security control of highly restricted area likely military zones on area around top government offices. The system can be used by every man for their security purpose. For general public android application will installed on their mobile phone. After that whenever he wants to know details of any vehicle he just have to capture the image of license plate and that image will be processed and he will get the desired information about that vehicle. The system is implemented and simulated in java, and its performance is tested on real image.



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II. LITERATURE REVIEW

Muhammad tahir qadri, et.1 [1], proposed Automatic number plate recognition system for vehicle identification using optical character recognition, ANPR is an image processing technology which uses number plate to identify the vehicle. The objective is to design an efficient automatic authorized vehicle identification system first detects the vehicle and captures the vehicle image. Vehicles number plate region is extracted using the image segmentation in an image. Optical character recognition technique is used for the character recognition. The resulting data is then used to compare with the records on a database so as to come up with the specific information like the vehicles owner, place of registration, address etc.,

Ayatullah faruk Mollah, et.1 [2], proposed Design of an optical character recognition system for camera based handheld devices, a complete Optical character recognition (OCR) system for camera images embedded textual documents for handled devices. At first, text regions are extracted and skew corrected. Then, these regions are binarized and segmented into lines and characters. Characters are passed into the recognition module.

Vadini Sharma, Prakash C. Mathpal, et.1 [4], proposed Automatic license plate recognition using optical character recognition and template matching on yellow colour license plate, Automatic license plate recognition is used to recognize the characters from license plate image. It is widely used in various areas such as traffic control, robbery and surveillance. The proposed method applied on yellow colour license plate. It has two main stages. Firstly, exact location of the license plate is detected from an input image by using image acquisition and optical character recognition and secondly, template matching is used to test the recognized character with templates.

III. FEATURES & LIMITATIONS OF EXISTING SYSTEM

A. Features of Existing System

- Recognizes license plate images taken using the license plate recognition camera.
- An alarm is sounded off when a vehicle having a license plate number not listed in the registered database is detected.
- License plate number detected by the system is recorded in the logs and can be searched and used for later analysis.

B. Limitations of Existing System

- High cost is required for high definition camera.
- It is necessary to provide power supply cable to camera.
- Distance matters.

IV. PROPOSED SYSTEM

It is just simply the ability to extract and recognition a vehicle number plate's characters automatically from an image. It consists of a camera that has the capability to capture an image, find the location of the number in the image and then extract the characters for character recognition tool to translate the pixels[2][3] into numerically readable character. It became much interest during the last decade along with the improvement of digital camera technology and the computational processing. ANPR can be used in many areas from speed prosecution and management of parking lots. It can be used also to detect and prevent criminal activities and road control of parking violations in the prohibited area.

Advantages of Proposed System

- It's cost is low compared with existing system.
- Doesn't require any external resources.
- Built-in camera within the application.
- In odd situations, any individual can easily access the accused details.

The main outlines of the project is capturing an image of any vehicle using the Android application which we created, this captured image is displayed on the user interface of the application. This captured image undergoes several operations and displays the extracted number plate from the whole image to the user. This recognized number plate is

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automatically cropped and is further used for processing the Alphanumeric Characters as an output. The image processing techniques like segmentation and character recognition are performed. Then after, the characters and numbers of the number plate are displayed on the text view. These converted alphanumeric characters can be used to identify the details of the owner to the vehicle.

V. PROPOSED SYSTEM BLOCK DIAGRAM

The proposed system consists of 6 stages, where Android mobile Application is designed using the Number plate recognition, Segmentation and Optical character recognition code is created and these are helpful in extracting and displaying the License plate number on the user screen.

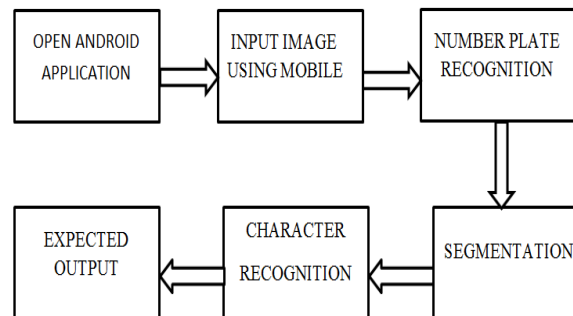


Fig.1. Block Diagram

Input Image Using Mobile [2]

This is the first phase deals with acquiring an image. In the proposed system, a digital camera of an android mobile phone of 3.2 megapixel camera is used. The input image is 120*160 or 1200*1600 pixels.

Number Plate Recognition [3]

The basic step in recognition of vehicle number plate is to detect the plate size. Here the segmented image is multiplied with gray scale image so that we only get the number plate of the vehicle.

Character Segmentation [1][2]

There are many different methods for character segmentation, propose, The first step is stretching the contrast of the image to extend over the entire range of gray levels available (0-225). The next step is threshold the image. Thirdly, search for connected components in the image and assign a special label for each connected component. Finally, resize each character from previous step to the standard size (20x10) to be used for next step recognition process.

Optical Character Recognition

Optical character recognition (OCR) is the process to convert the images of handwritten, or typewritten into machine encoded text. In the previous researches, there are numerous methods such as Euclidean distance Hidden Markov Model (HMM), Artificial Neural Network (ANN), Support Vector Machine (SVM) and template matching.

VI. RESULTS

Below are the screens displayed in a android device, when we open the Automatic Number Plate Recognition Application. When the recognition is clicked, then the action performs on the selected image and directs the screen to another screen. We can also see the License plate number is displayed after segmentation and Optical Character Recognition. The exact number plate is displayed only after converting the whole image into bitmap and extracting the required rectangular plate region.

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Fig.2. Capturing Screen with Recognition Button

In this figure we can observe the initial screen in you android phone. Where there'll be access to camera and you can see the button named "Recognition" too at bottom. So in this screen we can capture the required number plate, and by clicking the recognition button, the system will fetch the data mapped to that bike

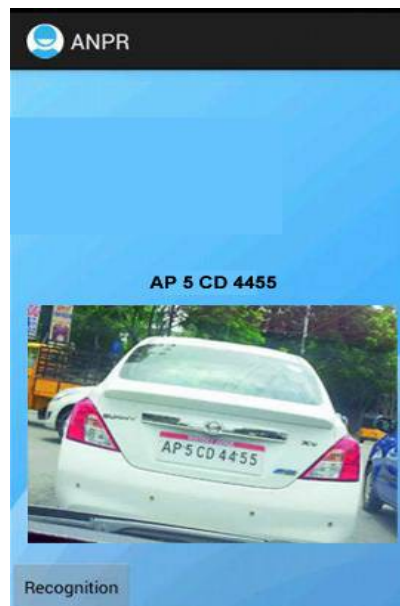


Fig.2. Capturing Screen with Recognition Button

Fig.3. Recognition Screen

After capturing we will be redirected to next page, in mobile application. Here we can see the fetched data along with the cropped number plate.



Fig.3. Recognition Screen



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VII. CONCLUSION

In this project, we aimed to develop a licence plate recognition system using Optical Character Recognition(OCR) in Android platform. We captured the images through camera module from our android application without noise and read characters from those images. Android platform is used because of its free availability. So, anyone can use this application through google playstore and can be used in any situations.

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BIOGRAPHY

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