

AUTOMATIC NUMBER PLATE RECOGNITION IN ANDROID

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ABSTRACT

Android platform has gained popularity in recent years in terms of market share and number of available applications. Android operating system is built on a modified Linux kernel with built-in services such as email, web browser, and map applications. In this paper, automatic number plate recognition (ANPR) was designed and implemented on Android mobile phone platform. It is just simply the ability to extract and recognition a vehicle number plate's characters automatically from an image. In the existing scenario they implemented the recognition of car license plate for automatic parking system. The developed algorithm was using motor vehicle regulation car license plate patterns according to motor vehicle regulation and 4 layers back propagation neural network with supervised learning. However, they implemented in such a high specification devices, namely high resolution camera and powerful computer system.

INTRODUCTION

Android platform has gained popularity in recent years in terms of market share and number of available applications. Android operating system is built on a modified Linux kernel with built-in services such as email, web browser, and map applications. In this paper, automatic number plate recognition (ANPR) was designed and implemented on Android mobile phone platform. First, the graphical user interface (GUI) for capturing image using built-in camera was developed to acquire car plate

number. Second, the preprocessing of raw image was done using contrast enhancement, filtering, and straightening. Next, an optical character recognition (OCR) using neural network was utilized to extract texts and numbers. The proposed ANPR algorithm was implemented and simulated using Android SDK on a computer. The preliminary results showed that our system is able to recognize most of the plate characters by almost 88%. Future research includes optimizing the system for mobile phone implementation with limited CPU and memory resources, and geo-tagging of the image using GPS coordinates and online database for various mobile applications. Automatic Number Plate Recognition (ANPR) is sometimes known by various other terms, Automatic License Plate Recognition (ALPR), Automatic Vehicle Identification (AVI), Car Plate Recognition (CPR) and License Plate Recognition (LPR). The whole terms is referring to the optical character recognition using the camera to read the number plate on vehicle. It is just simply the ability to extract and recognition a vehicle number plate's characters automatically from an image.

LITERATURE SURVEY

The ANPR system works in three steps, the first step is the detection and capturing a vehicle image, the second steps is the detection and extraction of number plate in an image. The third section use image segmentation technique to get individual character and optical character recognition (OCR) to recognize the individual character with the help of database stored for each and

every alphanumeric character [1]. As far as the general license plate number recognition system is concerned, the traditional image recognition function is so often subjected to external factors that the license plate number recognition accuracy is greatly reduced. The factors such as light, weather, and dirty spots on the plate will produce the so-called miscellaneous points and the existence of these miscellaneous points will obviously reduce the accuracy rate of the general license plate number recognition. In this paper, we make use of extension theory to successfully develop an intelligent license plate number recognition system and prove that it can efficiently enhance the recognition accuracy rate by means of the strong anti-noise ability of extension theory [2]. This work deals with problematic from field of artificial intelligence, machine vision and neural networks in construction of an automatic number plate recognition system (ANPR). This problematic includes mathematical principles and algorithms, which ensure a process of number plate detection, processes of proper characters segmentation, normalization and recognition.

Work comparatively deals with methods achieving invariance of systems towards image skew, translations and various light conditions during the capture. Work also contains an implementation of a demonstration model, which is able to proceed these functions over a set of snapshots [3]. Extraction of car license plate is important for identifying a car. Since there are some problems such as poor ambient lighting problem, bad weather problem and so on, the car images can be distorted and the car license plate difficult to extract. This paper proposes a method of extracting car license plate using motor vehicle regulation. In this method, some features of car license plate according to motor vehicle regulation such as color information and shape are

applied to determine the candidates of car license plates. To certify the license plate, the characters, numbers and their patterns are recognized by back propagation neural networks in windows which are opened in those boundaries of candidates. For the results of recognition by neural networks, the candidate which has characters and numbers patterns according to motor vehicle regulation is certified as license-plate region. Since the results of characters-pattern recognition are used to certify the license plate, the ability of license-plate extracting is enhanced and the car is identified simultaneously. The results of the experiments with 70 samples of real car images show the performance of car license-plate extraction by 84.29%, and the recognition rate is 80.81% [4].

EXISTING SYSTEM

The ANPR was invented in 1976 by the UK's Police Scientific Development Branch. It is just simply the ability to extract and recognition a vehicle number plate's characters automatically from an image. In the existing scenario they implemented the recognition of car license plate for automatic parking system.

The developed algorithm was using motor vehicle regulation car license plate patterns according to motor vehicle regulation and 4 layers back propagation neural network with supervised learning. However, they implemented in such a high specification devices, namely high resolution camera and powerful computer system.

Automatic number plate recognition (ANPR) was designed and implemented on Android mobile phone platform. First, the graphical user interface (GUI) for capturing

image using built-in camera was developed to acquire car plate number. Second, the pre-processing of raw image was done using contrast enhancement, filtering, and straightening.

PROPOSED SYSTEM

Automatic number plate recognition (ANPR) was designed and implemented on Android mobile phone platform. First, the graphical user interface (GUI) for capturing image using built-in camera was developed to acquire car plate number. Second, the pre-processing of raw image was done using contrast enhancement, filtering, and straightening. Next, an optical character recognition (OCR) using neural network was utilized to extract texts and numbers. The proposed ANPR algorithm was implemented and simulated using Android SDK on a computer. The preliminary results showed that our system is able to recognize most of the plate characters by almost 88%. Future research includes optimizing the system for mobile phone implementation with limited CPU and memory resources, and geo-tagging of the image using GPS coordinates and online database for various mobile applications. 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 into numerically readable character. It became much interest during the last decade along with the improvement of digital camera technology and the computational processing. Mostly, the ANPR system works in three steps, the first step is the detection and capturing a vehicle image, the second steps is the detection and extraction of number plate in an image. The third section use image segmentation technique to get individual character and optical character recognition (OCR) to recognize the individual character with the help of

database stored for each and every alphanumeric character. However, in this paper we proposed the design algorithm that we do not capture the vehicle image. We do capture the vehicle plate number image hence in the following step we do only the image segmentation and optical character recognition (OCR). ANPR can be used in many areas from speed prosecution and management of parking lots. The ANPR design that can be implemented on limited resolution camera and limited power of devices or systems such as s phone or any other cellular device.

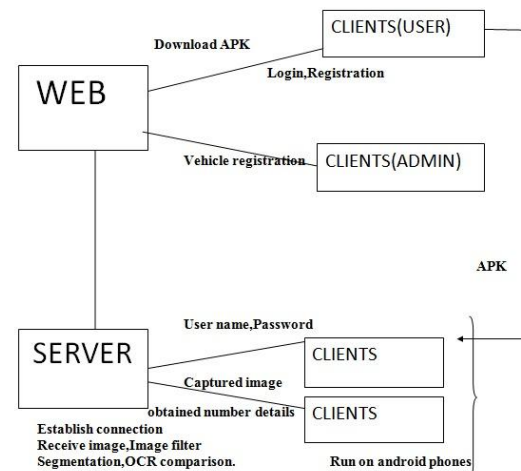


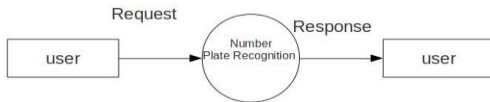
Fig 1: Proposed architecture of ANPR

Features of JAVA: Compiler and Interpreter, Platform Independent, Object-Oriented, Robust and Secure, Distributed, Simple, Small and Familiar, Multithreaded and Interactive, Dynamic and Extensible Code, Portable and High Performance.

Android: The Android Open Source Project (AOSP) is led by Google, and is tasked with the maintenance and development of Android. According to the project "The goal of the Android Open Source Project is to create a successful real-world product that improves the mobile experience for end users." AOSP also maintains the Android Compatibility Program, defining an "Android compatible" device "as one that

can run any application written by third-party developers using the Android SDK and NDK", to prevent incompatible Android implementations. The compatibility program is also optional and free of charge, with the Compatibility Test Suite also free and open-source.

LEVEL 0



LEVEL 1

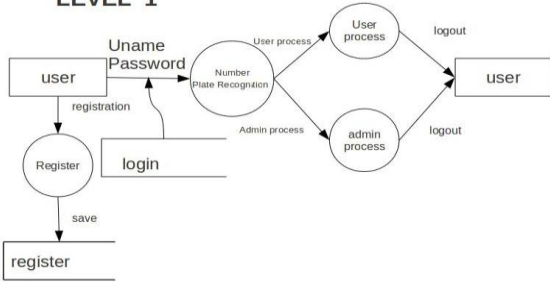


Fig 2: Level 0 and Level 1 data flow diagram

LEVEL 2 (USER)

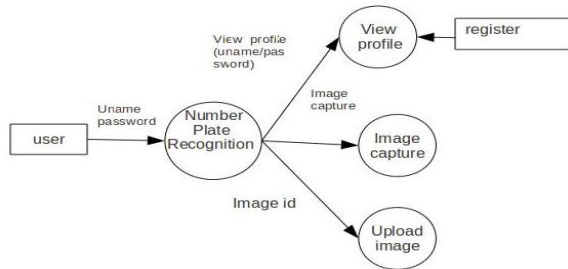


Fig 3: User Level 2 diagram

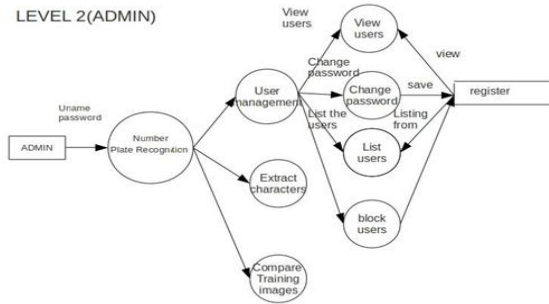


Fig 4: Admin Level 2 diagram

RESULTS AND DISCUSSION



Fig 5: User Profile Creation Page

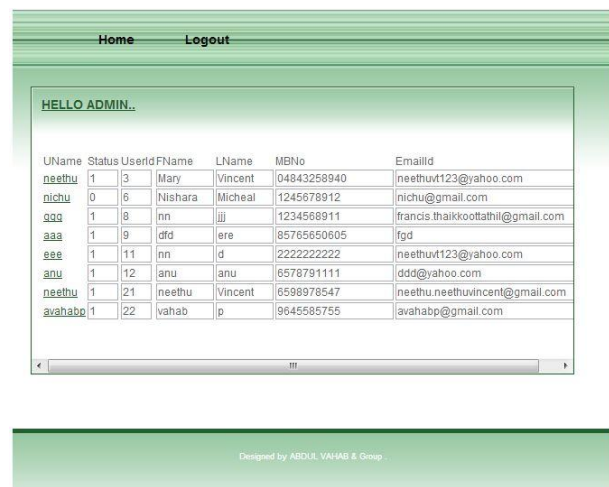


Fig 6: User Details Page

Vehicle Name

Vehicle Model

Vehicle Owner

Registration Number

RTO Office

Fig 7: Vehicle Registration Form

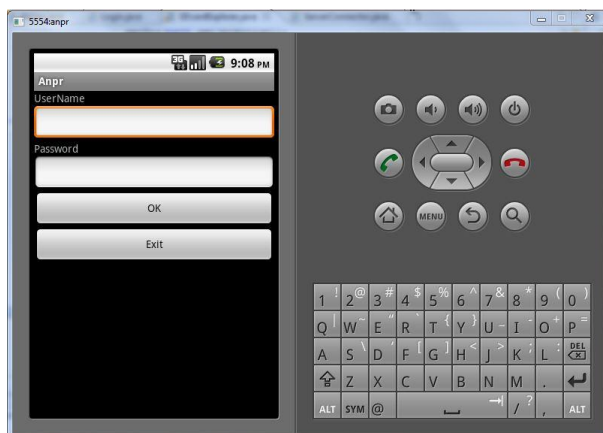


Fig 7: Mobile Login Form



Fig 8: Vehicle Details Window

CONCLUSION AND FUTURE WORK

This paper has generally discussed on design and implementation of automatic number plate recognition (ANPR) on android mobile

phone platform. In conclusion, we have proposed the design of ANPR that can be implemented on android mobile phone platform. This system is designed for the identification of number plates and the system is tested over a large number of images. Finally, results showed that the proposed system achieved accuracy of 83.5% for the segmentation of the characters and 92% for the recognition unit providing an overall system performance of %88 recognition rates.

Furthermore, the proposed system can be redesigned for multinational car license plates in future studies. Future research includes optimizing the system for mobile phone implementation with limited CPU and memory resources, and geo-tagging of the image using GPS coordinates and online database for various mobile applications.

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