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Vehicle Document Verification Based On Number Plate Recognition

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Abstract: The police forces use vehicle number plate for legal vehicle authorization purposes, to check if a vehicle is registered or not. Most of us keep the vehicle papers in the vehicle itself, which is not at all safe in case of theft. In today's world, it is not secure to carry our vehicle papers and wherever we go. Hence a system must be designed in which it is not necessary to carry our important documents to each and every place for verification. The aim is to design a system which captures the image of the number plate of a vehicle using a camera and the details are being retrieved. Then the details retrieved from the number plate in text format is used to extract all the important information of the vehicle like, the name of the owner, address of the owner, Insurance last paid date, emission test date etc. from the database. For us, it is useful as we do not have to carry our documents to every place with the fear of losing them.
Keywords: Image Pre-Processing, RGB, Greyscale, Segmentation, OCR, Character Recognition

I. Introduction

Nowadays the human population is increased and use of vehicles is also increased due to increased human beings and their needs. So controlling the vehicles has become a big complex problem. Number plate recognition is one of the methods that allows the extraction of number plate information. This system is an application of image processing technology that allows one to extract number plate information from an image. Image processing deals with the extraction of useful and meaningful information from digital images by various image processing techniques[2]. In Number Plate Recognition, the input is a colour or greyscale image and the output is a string of characters that is license plate number [2]. By using the various image processing techniques, number plate recognition system identifies the vehicles by tracking their license plate with minimum human intervention.

Number plate recognition is an image processing technological solution that captures photographs of number plates of vehicles and firstly by detecting and extracting the number plate, it segments the characters from the plate area and then by using feature extraction of the character recognition technique it displays the license number plate information. Features are the visual contents that recognize the alphabets and numbers. Then the owner information is obtained from a large database of registration details. Recognition process includes submitting a query, extracting characters of the image and obtain the owner details.

II. Ease of Use

The aim is to ease and facilitate the identification of the vehicle and the verification of the documents which are related to the vehicle. It will be very convenient, secure and time saving.

III. Scope

The Number Plate Recognition application incorporates the functions of reading the registration number of vehicles from digital pictures. Its primary purpose is to extract Number Plate information, log vehicle details and use a proprietary database to look up any registration numbers as the vehicle approaches and display information about the owner of the vehicle. In Order to store information of registered vehicles, a Database must be created. The Database will be needed in order to demonstrate the effectiveness of the information retrieval and storage. The objective is to design an efficient automatic authorized vehicle number plate recognition and document verification. The is used for security purpose.

IV. Literature Survey

Sl.No	TITLE	AUTHOR	METHODOLOGY	PROS & CONS
1	Automatic number plate recognition system for vehicle identification using optical character recognition.	Muhammad Tahir Qadri and Muhammad Asif.	ANPR System, OCR algorithm.	The system robustly detect and recognize the vehicle using license plate. The camera used in this project is sensitive to vibration.
2	Automatic License Plate Recognition.	D.Renuka Devi and D.KanagapushpavaUi.	License plate recognition, segmentation.	Locate the license plate of the car and also recognize the characters. Rejection error the system is unable to read the input character and in substitution error, the system miss recognizes the character and substitutes the character
3	Number Plate Recognition And Document Verification Using Feature Extraction OCR Algorithm.	Bhonsale Tejas, Dhamal Omkar, Dhumal Rutuja, Khedekar Prajakta, Patil Bhakti.	OCR algorithm, Character Recognition	User-Friendly, it is a secure system Fonts other than the standard form are difficult to recognize correctly.
4	Smart Vehicle Number Plate Detection System for Different Countries Using an Improved Segmentation Method.	G. Naveen Balaji & D. Rajesh.	Ant's colony optimization (ACO) Algorithm, License plate recognition.	Recognizes the authorized vehicles by tracking their license plate without direct human interference. During the recognition some difficulty occurs as follows: Blur Images, Broken Number Plate, Similarities between some characters

V. Comparison with existing system

An efficient character recognition algorithm for recognizing the number plate is presented. Multiple features are extracted and fused together. The system is user-friendly and also it is a secured system. Implementation cost of the system is less. The system robustly detects and recognize the vehicle using license plate Naveen and Rajesh introduced an impressive number plate detector but it faced the problem of blurred image and Similarities between some characters. In our project we overcome this problem by using camera with good clarity. If the algorithm is unsure of a character – the software will produce multiple character codes and choose the proper character.

Bhonsale and Omkar implemented an impressive Number Plate Recognition system where the problem of recognizing fonts other than standard form occurred. The optical character recognition algorithm recognizes all the alphanumerical characters including all font styles.

VI. System Architecture

The overall system design consists of following modules:

- ✧ Input image.
- ✧ Pre-processing
- ✧ Segmentation.
- ✧ Number plate extraction.
- ✧ Search for the record.
- ✧ Display Record.
- ✧ Apply fine (if any)

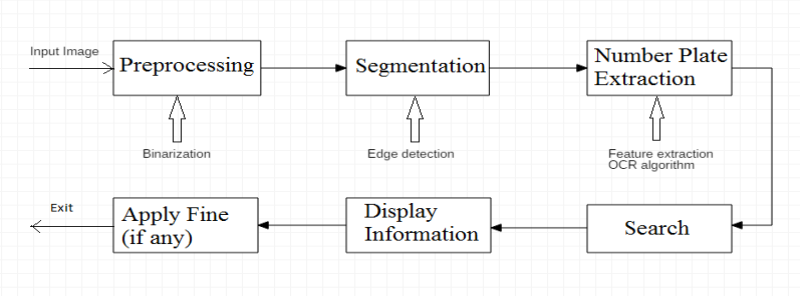

Figure 5.1: System Architecture

The NPR system works in these steps, the first step is the capturing the image of number plate, the second step is to apply pre-processing on the captured image to remove noise from the image, then extraction of vehicle number plate. Segmentation is for individual character recognition. Optical character recognition (OCR) is one of the methods to recognize the each character with the help of database stored for the respective alphanumeric character.

OCR algorithm has the following steps:
Step 1 – Loading the image file: In order for OCR to be effective, it must support a wide array of file formats, including PDF, BMP, TIFF, JPEG, and PNG files.
Step 2 – Improving image quality and orientation: Depending on the method in which the image file was created, there are a number of issues that may arise like blurred image.
Step 3 – Removing lines: This allows for better recognition quality when converting tables, underlined words, etc.
Step 4 – Analyzing the page: This includes the detection of text positions, white space, and the prioritization of important text areas or sections
Step 5 – Detecting words and lines of text: Here we also need to take care of different font sizes and small spaces between words.
Step 6 – Analyzing and fixing of "broken" or "merged" characters: The OCR software must now break down and resolve these errors in order to properly interpret the appropriate characters.
Step 7 – Recognizing characters: This is the primary function of Optical Character Recognition. Now that the original file has been processed, cleaned, and fixed – the OCR technology can begin to read and translate characters. Each image of every character is converted into a character code. If the algorithm is unsure of a character – the software will produce multiple character codes and choose the proper character later on.
Then the details retrieved from the number plate in text format is used to extract all the important information of the vehicle like, the name of the owner, address of the owner, date of registration of the vehicle etc. from the database.

VII. System Evaluation

Advantage
- ✧ User-Friendly.
- ✧ It is a secure system
- ✧ Memory space utilized efficiently.
- ✧ OCR algorithm is working best to produce best results.

Disadvantages
- ✧ It can have trouble because of lack significant contrast between characters and the background.
- ✧ Fonts other than the standard form are difficult to recognize correctly.
- ✧ In Poor lighting and low contrast, it may be difficult to extract the image and recognize characters correctly.
- ✧ Camera should be of good quality otherwise correct text from the images would not be extracted properly.

Conclusion

In this project we aimed to develop a number plate recognition system using OCR in android studio and windows. We got images by capturing image through a camera without noise and tried to read the character from that image. Android platform is used because of its availability. ANPR application has been developed on android phone making use of open source libraries. Different algorithm for image acquisition, image processing, plate detection, and character recognition has been used.

References

[1] Muhammad Tahir Qadri and Muhammad Asif "Automatic number plate recognition system for vehicle identification using optical character recognition" 2009 International Conference on Education Technology and Computer.

[2] D Renuka Devi and D.Kanagapushpavalli "Automatic License Plate Recognition". 2013

[3] Bhonsale Tejas, Dhamal Omkar, Dhumal Rutuja and Khedekar Prajakta, Patil Bhakti "Number Plate Recognition And Document Verification Using Feature Extraction OCR Algorithm" 2009 International Conference on Intelligent Computing and Control Systems.

[4] G. Naveen Balaji1 and D. Rajesh2 "Smart Vehicle Number Plate Detection System for Different Countries Using an Improved Segmentation Method" Imperial Journal of Interdisciplinary Research (IJIR) Vol-3, Issue-6, 2017.

[5] Mohini S.Karande, Aditi A.Dahotre, Riya A.Malushte and Prof.Avinash Palve "Number Plate Recognition System using OCR for Automatic Toll Collection" International Journal of Science Technology & Engineering Volume 2 Issue 10 April 2016.

[6] Er. Kavneet Kaur and Vijay Kumar Banga "Number plate recognition using OCR technique" 2012 International Journal of Research in Engineering and Technology.

[7] Ravina Mithe, Supriya Indalkar, Nilam Divekar " Optical Character Recognition " 2013 International Journal of Recent Technology and Engineering.