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Vehicle Number Plate Recognition System

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ABSTRACT: Vehicle Number Plate Recognition System is the system used to recognize the number plate of the different vehicle using various artificial and machine learning algorithm and using optical character recognition system. This system uses the optical character recognition system and using the snapshot of the number plate the characters present in the image is converted to digital texts. An image is obtained from the local camera and is processed using OCR technology. Text is extracted from the image obtained from the camera. Various machine learning algorithms are applied on the image such as KNN, Artificial Neural Networks and Decision Tree,this system could be used in various sector for better and efficient operations .It is used by various defense sector such as police, National Intelligence to track several vehicle activities , it is also used by many security agencies to keep a track record of vehicles and predict or analyze any threat or incident. Traffic surveillance is one of the practical usage of the system through which monitoring of traffic congestion and violation of the traffic guidelines by vehicles could easily be detected and dealt easily.

KEYWORDS: automatic number plate recognition, optical character recognition, k nearest neighbor, artificial neural network, decision tree, traffic surveillance, text extraction.

I. INTRODUCTION

With the growing number of vehicles, finding a car park is a serious issue today for a large number of students and faculty at Educational Institutions. Most of the car parks are managed manually by security guards who do not keep a track of the number of vehicles entering and exiting the premises. Hence, the vehicle driver has to keep circling the car parking in order to find a vacant slot leading to a wastage of time, not to mention the anxiety and frustration of the driver. The absence of the security guards may also lead to vehicle thefts. In Malnad College of Engineering, the problem is getting acute day by day due to the fact that the number of student enrolments is increasing year by year and a huge percentage of students and faculty own cars with the limited number of parking lots. It is not always possible to increase the parking area to accommodate the growing number of vehicles, therefore developing an efficient ANPR is the need of the hour.

Thispaper dealswiththeimplementationof the ANPR technology, it uses pattern recognition technique to recognize the characters printed on the vehicle number plate. It uses the concept of optical character recognition technique to recognize the single characters one by one using different techniques such as observing the curve pattern of the text or analyzing the single characters pixel by pixel even the number plate format is already being defined in the system which is different for different places. In this system generally six primary algorithms are used by the software to recognize the vehicle number plate: 1) Plate localization – it is used to filter out or distinguish the vehicle number plate from the image obtained by the camera 2) Plate orientation and sizing – it adjusts the dimensions of the cropped image to the appropriate size 3) Normalization –it adjusts the light level and contrast of the picture obtained by the camera 4) Character segmentation – it analyses the individual character 5) Syntactical/Geometry analysis –it verifies the characters and its positions in accordance with the different country rules.

As a vehicle passes , ANPR reads Vehicle Registration Number and the digital image captured by the camera is converted into data, which is processed through the ANPR system. This is very useful in the case of traffic analysis to identify the violation of the traffic laws by various vehicles, also it used in case of security aspects to identify the theft/crime suspects using the vehicle registration number.

II. LITERATURE SURVEY

Automatic Number Plate Recognition System is a methodology in which detection of the vehicle number plate is done automatically using some specific algorithm and techniques. ANPR system could be used by many of the law enforcement agencies to analyze the different criminal activities as usage of other conventional methodologies such as Radio identification tags and usage of similar equipment's are reduced. Since there are many different styled number plates, it is very complicated to identify such nonstandard number plates. This paper discusses about a pixel segmentation algorithm of the characters on the number plate. Using the concept of artificial neural network the complexity could be reduced and could increase the efficiency of the system up to 91.59%. The same is described in Fig 1. [1]
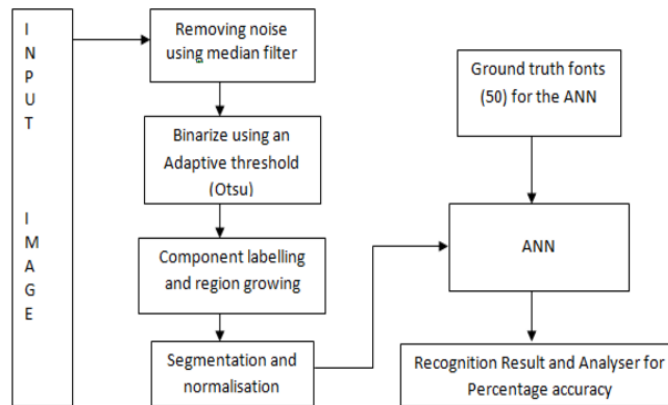

Fig.1.Pixel Segmentation to identify characters

Now days getting an appropriate car parking is a very difficult task to do. It is very difficult for the different parking agencies to handle the allotment of the parking space accordingly and efficiently and requires a lot of man power and time. This paper is about the study and design of a car parking control system using optical character recognition(OCR) devices, it uses a client server based functionality , the parking administrator could monitor the system and the respective database from the server side. In extension the parking information would be displayed on a static based. The system would be able to save log records that will ease out the parking record and parking credit could easily be done using the system. [2]

Traffic control and vehicle owner identification has become a vast problem in many counties. Many of the times it is very difficult to identify the records of the vehicle using the conventional methods , and it is very difficult to identify the owner of the vehicle who have violated the traffic laws and to apply penalties as such. Therefore using the automatic number plate recognition system , the complexity of the task would be decreased and the number plate could easily be recognized by the system. In this paper different approaches of ANPR are mentioned considering the different sizes of images, and different ways of increasing processing time.[3]

Vehicle identification is one of the major problemis many of the countries. Identifying the different types of vehicles from the n number of vehicles present in the current market is a very complex task to do. Sometimes identifying the vehicle just by an image is very difficult. Hence different methodologies are being used currently in the market to identify various vehicles. In this paper similar approach is being discussed using one of most widely used algorithm Sobel Edge Detection , it used for the detection of the edges using the pixel concentration and intensity, the more the intensity the more evident result would be. Using Sobel algorithm detection of the vehicle is done and Sobel operator can be a good fit for vehicle type recognition.[4]

III. OBJECTIVES

Using the automatic number plate recognision system number plate of different vehicle could easily be tracked using the concept of Optical Character Recognition System , each character could be segmented and identified.

The objectives of the study include:

- Image capturing using the camera installed in the campus.
- Optimization of the image captured and enhancement of the image to increase the quality of the image.
- Using Optical Character Recognition to recognize the characters from the license plate.
- To reduce the error rates in the process of vehicle registration number recognition.
- To generate a statistical and analysis report with the data obtained.
- To reduce the manpower used in the real time.
- Toenable provision of challans or charges to the registration number and logging.

IV. PROPOSED METHODOLOGY

Using the automatic number plate recognition system number plate of different vehicle could easily be tracked using the concept of Optical Character Recognition System , each character could be segmented and identified.

The proposed study deals with a system that could be installed in the college campus to monitor and track the different vehicle entering and exiting from the college campus, which could be analyzed by the respective authorized personnel to make use of data obtained using this system. According to the data obtained using the system the parking allotment could be implemented by the authorized personnel.
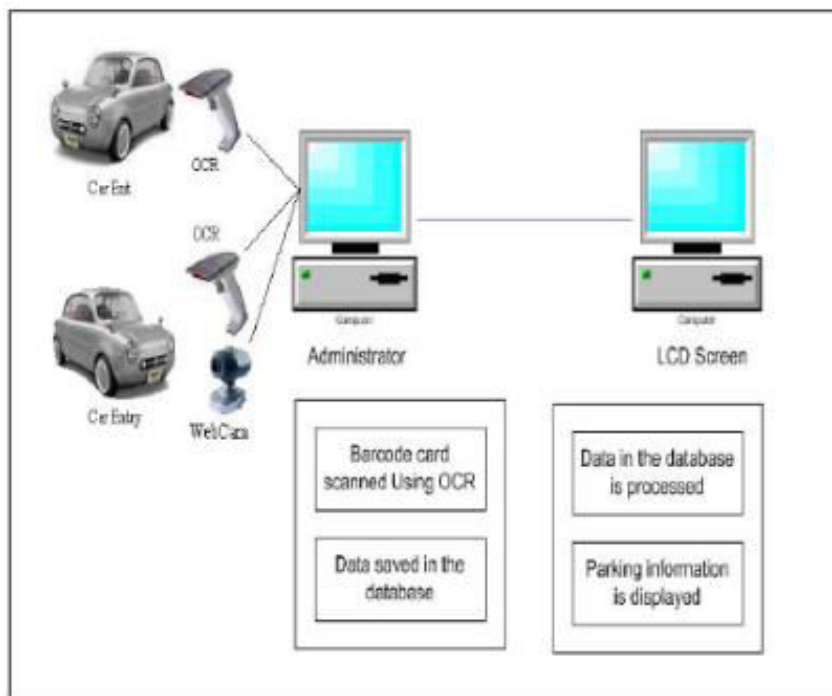

Fig 1.1

In Fig 1.1 , illustration of the system is defined , the image is captured from the primary camera of the campus that must be installed at the entrance and exit gates of the campus, once the image is being captured by the camera , it is then then converted into digital data , using the concept of optical character recognition the characters from the image is being extracted and recognized separately using several dimensionality features.

In figure 1.2, illustration of how the characters from the number plate are being extracted is being described, once the image is being captured from the camera, localization of plate region is done , and the characters are being segmented from the image, once the characters are segmented, the segmented characters are compared with the

templates present in the database , the characters are being compared and the maximum corelating template is obtained , the output is redirected to the system.
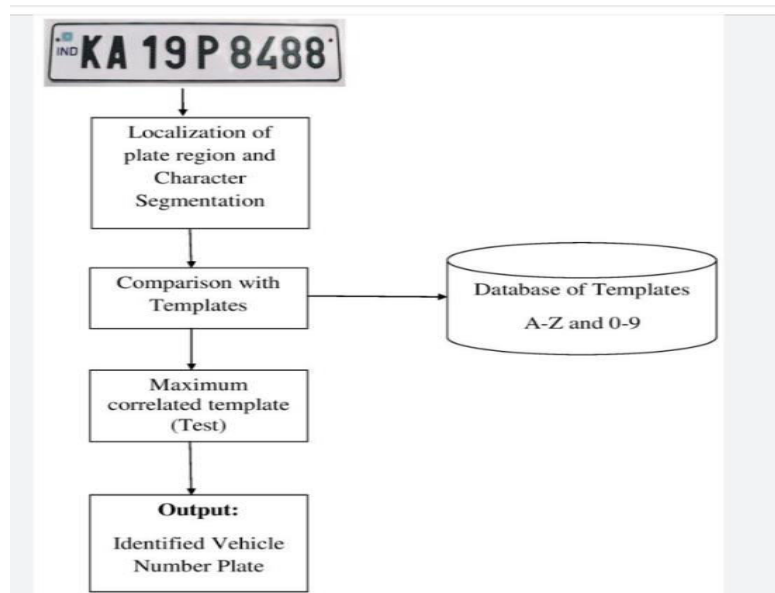

Fig.1.2.Flowchart of character segmentation

V. ADVANTAGES

The proposed ANPR system has many advantages than current conventional system. As mentioned earlier, the proposed ANPR system has many advantages than current conventional system. Automatic Number Plate Recognition (ANPR) is a real time embedded system which identifies the characters directly from the image of the license plate. It is an active area of research.

Automated framework requiring less labour. Number is displayed and with some modification can be stored in a database or be searched or processed. Image Enhancement and pre-processing to improve the quality of the image and convert the image to binary scale so as to use it in contour extraction. Apply optical character recognition to display the license plate number from the picture as text. To reduce redundancy and error in number plate recognition. To generate analytical reports based on vehicle recognition. To minimize manpower required. To enable easier provision of remuneration to number plate detection and logging.

VI. CONCLUSION AND FUTUREWORK

In this paper we have presented the ANPR system which is used for vehicle license plate. This system does the image processing by scanning the license plate and recognizing the texts using the optical character recognizers. considering the vehicle number plate as input image, system extracts the number from the image and searches the database for that recognized number plate. It recognizes the number plates even in the low light or shadow like conditions.
ANPR by using a pixel based segmentation algorithm of the alphanumeric characters in the license plate.
ANPR is quite popularly uses nowadays.
Additionally, there is an option available to the end-user for retraining the Artificial Neural Network (ANN) by building a new sample font database
Thus, ANPR serves as daily facility.
Using the high resolution camera can increase the speed of the ANPR system.
Small cameras can read fast, along with included durable processors. Today's advanced technology has taken ANPR system to limitedly expensive and hard to set up.
Automatic License Plate Recognition (ALPR) System plays an important role in various real time applications like toll payment, electronic payment systems and parking fee payment, border crossing control systems, identification of stolen vehicles etc.

REFERENCES

1. A Roy and D.P Ghoshal, "Number Plate Recognition for use in different countries using an improved segmentation," in 2nd National Conference on Emerging Trends and Applications in Computer Science (NCETACS), 2011.
2. Anton Satria Prabuwono and Ariff Idris, "A Study of Car Park Control System Using Optical Character Recognition",International Conference on Computer and Electrical Engineering, 2008. ICCEE 2008.
3. Chirag Patel, Dipti Shah, Atul Patel," Automatic Number Plate Recognition System (ANPR): A Survey", International Journal of Computer Applications, 2013.
4. Weihua Wang, "Reach on Sobel Operator for Vehicle Recognition, "International Joint Conference on Artificial Intelligence, 2009
5. Ch. Jaya Lakshmi, Dr. A. Jhansi Rani, Dr. K. Sri Ramakrishna, and M. Kanti Kiran, "A Novel Approach for Indian License Recognition System," International Journal of Advanced Engineering Sciences and Technologies, 2011
6. SaimaRafique, Mahboob Iqbal and Hafiz Adnan Habib, "Space Invariant Vehicle Recognition for Toll Plaza Monitoring and Auditing System", Multitopic Conference, 2009.
7. C. Anantha Reddy, C. Shoba Bindu, "Multi-Level Genetic Algorithm for Recognizing Multiple License Plates in a Single Image", Journal of Innovation in Computer Science and Engineering, 2015
8. Anand Sumatilal Jain, Jayshree M. Kundargi, "Automatic Number Plate Recognition Using Artificial Neural Network", International Research Journal of Engineering and Technology (IRJET), 2015

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