AUTOMATIC VEHICLE LICENSE PLATE RECOGNITION SYSTEM AND ALCOHOL DETECTION

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ABSTRACT

License plate location is an important phase in vehicle license plate recognition for intelligent transport systems. This paper presents a robust and real time method of license plate location. License plate recognition has been widely studied,and the advantage of image capture technology helps to enhance or create new methods to achieve this objective.Due to the rapid growth of highways and the extensive use of vehicles, researchers launch more interest on proficient and accurate intelligent transportation systems. In such circumstances, it is difficult for identification of the vehicle number plate. The above mentioned challenge is highlighted in Automatic Number Plate Recognition of vehicle. For this, the concept of Optical Character Recognition is used. This work presents a strong technique for localization, segmentation and recognition of the characters within the located plate.In this work,a method for real time detection and segmentation of car license plate based on image analyzing processing techniques is presented.Here the optical character recognition algorithm (OCR) is used to recognize the individual character with the help of database stored for each and every alphanumeric character. After recognizing the license plate, the respective vehicle owner's details will be retrieved from the database. And these details can be used for checking whether the vehicle is licensed or registered. Here we also add the concept of alcohol detection and seat belt detection of the driver. By the concept of alcohol detection we can detect whether the driver has drunk or not. And by the concept of seat belt detection we can detect whether the driver of the vehicle has worn the seat belt or not.. If the driver has drunk or if he has not worn seat belt , then automatically notification will be send to the nearby toll service or police station.This proposed approach works well for low contrast, blurred and noisy images as well as dark and light/bright images useful for effective detection of characters in the license plate.

Keyword*:- localization, segmentation, optical character recognition system, alphanumeric, image capture, image acquisition, template matching.*

I.INTRODUCTION:

Automatic vehicle license plate recognition system plays a major role in real life such as in toll gates collection, parking lot accessing management, and road traffic monitoring. This system recognizes a vehicle's number plate in the form of an image by digital web camera. It is fulfilled by the combination of a lot of techniques such as image acquisition (capturing the image of real image of plate localizing the license plate character),segmentation (locating and identify individual character on the plate)and optical character recognition(OCR algorithm).Now a day's, recognition or identifying the information present on the moving objects is turning of great importance. The increasing human dwelling and the growth of industry arena in the current scenario has made vehicle a mandatory need which in turn leads into a serious traffic issues.

The recognition procedure is generally sub-divided into four parts are
1)Image acquisition means capturing the image of the license plate
2) Pre-processing the image i.e. localizing the license plate
3)Charactersegmentation i.e. locating and identifying the individual symbol image on the plate
4) Optical character recognition.

II.EXISTING SYSTEM:

Vehicles plays an most important role in our life.But there are many problems in vehicle driving such as accidents due to drunk and drive ,over speed, theft of vehicles.There are adequate number of applications and software available in the market to identify or recognize the registration number plates. These systems serve the purpose with few limitations. To cite a few: these applications consume ample amount of time for the recognition also they require image with high quality. The existing ANPR methods works well for dark and light/bright images but it does not work well for low contrast, blurred and noisy images.

III.PROPOSED SYSTEM:

In this proposed system, we recognize the vehicle number plate through the cameras, CCTV's which will be converted from RGB image to Optical Character Recognition (OCR). This proposed system works fine for low contrast, blurred images as well as dark and light/bright images. An alcohol sensor is placed in the steering, and if the alcohol has been consumed by the driver, then automatically the sensor detects it and sends the notification to the nearby toll or police station so that the drunken driver can be stopped from driving the vehicle. Additionally, a seat belt detector is embedded in the system which is used to detect whether the driver has worn seat belt during driving or not. If not, then notification will automatically be send to the toll or police station.

IV.SYSTEM FLOW FOR VEHICLE REGISTRATION PLATE RECOGNITION SYSTEM

The process of ANPR starts with identifying a registration plate of the vehicle. It involves the algorithms used which are able to identify rectangular area of registration plate from an original picture.
The identification and recognition process takes place in six phases mainly.

1) Preprocessing of Image
2) Localizing Registration Plate
3) Extraction of Characters
4) Segmentation of Characters
5) Recognition of Actual number plate
6) OCR using template matching

1) Preprocessing of Image:

The implementation is started by capturing the number plate of the vehicle. The edge detection and gray scale filter is applied initially as a preprocessing for selected image to isolate the number plate region which is a smaller part from extracted image. The gray scale picture is obtained by quantizing from neutral gray starting from the black as a weakest intensity to white as a highly strongest intensity. Now it is required to express in binaries by assigning the pixel values of 0 for black shade and 1 for white shade. Furthermore, the registration plate is identified by observing the quick change in the contrast. Rest of the area in the images made filtered. The actual registration plate location is located by matching the width and height.

Techniques enhancing the gray level ofregistration plate image
There aretwo techniques enhances the gray level of registration plate image.
a) Contrast Extension
b)Median Filtering

a)Contrast Extension:
The image contrast can be extended by means of the process of enhancing the contrast andequalization ofhistogram of that particularpicture. In other words, the image can be made sharpen by applying the extension of contrast. In order to improve poor picture contrast view, histogram equalization is a well-known technique.

b) Median Filtering:

To eliminate the unwanted noisy regions, median filter is used. Median filtering is a technique that passes the image between 3X3 matrix. The dimension can be modified according to level of noise for this matrix. The progress follows as mentioned below. The matrix of 3X3 is chosen for one pixel.

- o The pixel around the neighborhood are assigned.
- o The process of sorting is developedbetween ninepixels from small tobig.
- o Median element can be termed for the Fifthelement.

2) Localization:

Localizing registration plate is performed to eliminate the background which is unwanted details meaning that, we concentrate only on the number plate and rest of the area are ignored and hence focusing onto the required details on the registration plate. To detect the registration plate, we apply a top-flat filter to the complete image begin by a multistage region search. One more approach has been proposed to consider the vertical edges, for extracting the registration plate using sable operator. An edge detection and Hough transforms techniques are used to detect the vertical and horizontal edges, by using the registration plate in a rectangular shape. Image that was captured from the camera from 8-10 meters away can be processed through the registration plate extraction with providing its output to segmentation.

3) Extraction of Characters:

Extraction of characters is performed by separating the individual character area from the localized registration plate. This image contains the noise along with the actual image which is a tedious job, hence it is required to remove or eliminate the noise from the registration plate. The next process is performed called a digit filtering to remove the frame lines from the registration plate. This system solves the problem of extracting the registration plate on a higher level, by integrating the outcome of different threshold methods, also implementing the feedback from character recognition and character phases has been proposed.

4) Segmentation :

The further step is segmentation of the registration plate. The segmentation can be done for database character matching with the training data sets. It's totally clear that this is an important technic. If this process fails, then the characters will be improperly recognized. If we try to assume only one-row plates, the segmentation could be a process of finding horizontal boundaries between characters . Another method is implemented here called as aggregation of obtained segments. This phase of a number plate having characters not desirable parts like, hyphen, dashes and dots stretches further as redundant space on the edges of character. It is important to remove these parts and obtain only the registration plate characters. Since the segmented plate is deskewed, we could segment it by identifying spaces in its horizontal projection.

5)Recognition of Character:

This technique plays a vital role in this application to recognize the character extracted from the segmentation. The actual conversion of Number plate image into Optical Characters is performed in this phase and the clear identification of number plate is performed. For character recognition, we use the data set of individual character image of size 24X42. The extracted character will match with the similar data set and we get the proper optical character from the extracted image. For the character recognition, every character four data sets are collected of different variety. The test data set are used as alphanumeric such as characters A-Z only capital letters and the numbers from 0-9.Here we store the intensity values below algorithmic rule mentioned for each and every characters. Compute the values for each of the characters. We need to compute template matching score of the characters separated from the training data. The training data set contain the large number of data to compared with the localized plate. Each localized plate is compared with the SVM i.e. Support Vector Machine classifier which exactly matches or similar match occur. So the template matching is performed by comparing the only required comparisons.
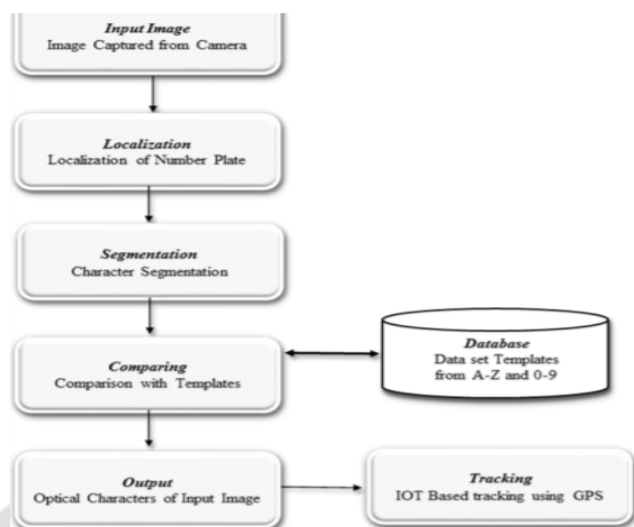
FIG1: System Flow Diagram for Vehicle Plate Recognition System

6) OCR using Template Matching:

The most commonly used technique for image comparison is Template Matching. In this technique, we are focusing to get the position of a subimage called a template, in the given image. The training data set matching describes the equality in a given training set. The process of comparing is done by pixel by pixel of the picture and find the match for each possible displacement. It enables the matching of datasets character matching with training data. We have used almost all possible training data sets to match recognized inputs. Training data set are created to match each character, number (from A-Z and 0-9) using method 'Regular' font style. The matched text can retrieve the vehicle owner details from the Regional Transport office database. The database consists of information like name, address, telephone number, etc.,. The below figure shows the training data set for some alphabets and numeric characters.
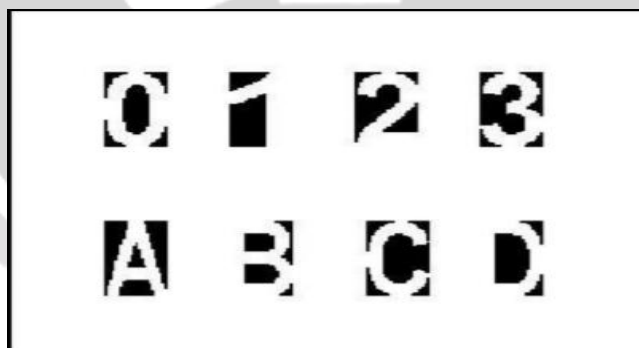

FIG2: Alphanumeric Characters as Data sets

V.FUTURE WORK :

There are many enhancements are possible with this research in order to add the quality and features. Here are some future enhancements possible as below.

*   This application can be modeled for internationalvehicle registration plates
*   The literature can be modified to capture the number plates which are not in the Indian standard format i.e. number plate contains two lines.
*   The regional language data set can be added to the database and the same will be recognized accurately.
*   Some number plate contains the unwanted data which can be recognized by redesigning the application.
*   The detected numbers can inform the user the RTO¬ location, region, district etc

VI. CONCLUSION:

In this paper, an industrial, robust and reliable ANPR system for high speed applications is proposed. The main advantage of our system is its high detection and recognition accuracies on dirty plates. We have tested this system on a publicly available English plate data set as well and achieved an overall accuracy of 97%. The proposed system is compared to many reported ANPR systems from different point of views.. These systems have been tested day and night over a year and presented robust and reliable performances, in different weather conditions, such as rainy, snowy, and dusty. The character recognition part of our system has been tested separately over the data set and achieved 98.5% accuracy, with comparably low computational requirement. It is guaranteed to be around 96% for the extraction of plate region, 95% for the separation optical characters recognition,and hence this gives the overall system performance better than the existing system. The recognition time is between 5 to 15 seconds which is relatively shorter than current time i.e. more than 30 sec.

VII.REFERENCES:

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