AUTOMATIC NUMBER PLATE RECOGNITION USING LABVIEW

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Abstract

A License plate recognition (LPR) system is one kind of an intelligent transport system and is of considerable interest because of its potential applications in highway electronic toll collection and traffic monitoring systems. Work has been done for Indian license plate recognition systems.

The purpose of this paper is to develop a real time application which recognizes license plates from cars at a gate, for example at the entrance of a parking area or a border crossing. The system, based on regular PC with video camera, catches video frames which include a visible car license plate and processes them. Once a license plate is detected, its digits are recognized, displayed on the user interface or checked against a database. The focus is on the design of algorithms used for extracting the license plate from a single image, isolating the characters of the plate and identifying the individual characters.

The proposed system has been implemented using Vision Assistant 8.2.1 & Labview 11.0 the recognition of about 98% vehicles shows that the system is quite efficient.

Keywords: Image Acquisition; License Plate Extraction; Segmentation; Recognition.

I INTRODUCTION

ANPR is an image-processing innovation which is used to perceive vehicles by their tags. This expertise is ahead of time ubiquity in security and traffic installation. Tag Recognition System is an application of PC vision. PC vision is a technique for using a PC to take out abnormal state information from a digital image. The useless homogeny among various tags for example, its dimension and the outline of the License Plate. The ANPR system consists of following steps:-

i Vehicle image capture.
ii Preprocessing.
iii Number plate extraction.
iv Character segmentation.
v Character recognition.

The ANPR system works in these strides, the initial step is the location of the vehicle and capturing a vehicle image of front or back perspective of the vehicle, the second step is the localization of Number Plate and then extraction of vehicle Number Plate is an image.

The final stride use image segmentation strategy, for the segmentation a few techniques neural network, mathematical morphology, color analysis and histogram analysis. Segmentation is for individual character recognition. Optical Character Recognition (OCR) is one of the strategies to perceive the every character with the assistance of data base stored for separate alphanumeric character.

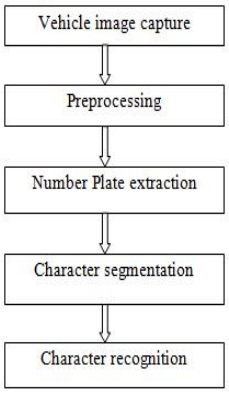


Fig1.1:- flow chart of ANPR system

II. PROPOSED METHOD

A. **Extracting color planes from image**: Since the color information is redundant so we extract color plane from the acquired 32-bit color image to make it an 8-bit greyscale image.

B. **Image mask**: An image mask isolates parts of an image for processing. If a function has an image mask parameter, the function process or analysis depends on both the source image and the image mask. An image mask is an 8-bit binary image that is the same size as or smaller than the inspection image. Pixels in the image mask determine whether corresponding pixels in the inspection image are processed

C. **Optical Character Recognition** (OCR): The exact mechanisms that allow humans to recognize objects are yet to be understood, but the three basic principles are already well known by scientists – integrity, purposefulness and adaptability. These principles constitute the core of OCR allowing it to replicate natural or human-like recognition. Optical Character Recognition provides machine vision functions we can use in an application to perform OCR. OCR is the process by which the machine vision software reads text and/or characters in an image.

Steps of an OCR training procedure

The process of locating characters in an image is often referred to as character segmentation. Before we can train characters, we must set up OCR to determine the criteria that segment the characters you want to train. When we finish segmenting the characters, we'll use OCR to train the characters, storing information that enables OCR to recognize the same characters in other images. We train the OCR software by providing a character value for each of the segmented characters, creating a unique representation of each segmented character.

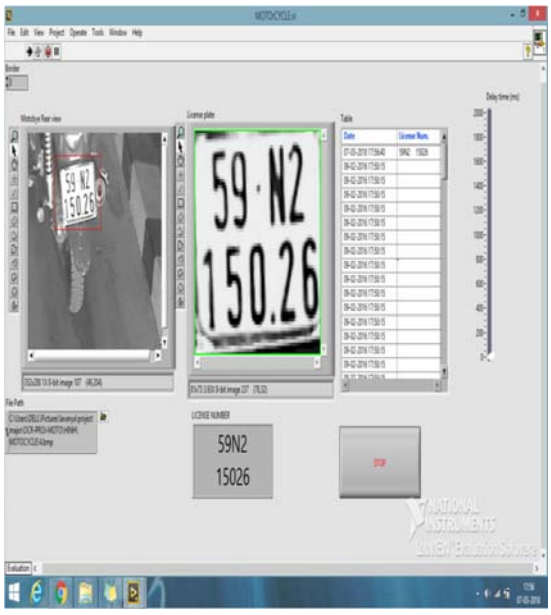
D. **Reading Characters**: When we perform the reading procedure, the machine vision application we created with OCR functions segments each object in the image and compares it to characters in the character set you created during the training procedure. OCR extracts unique features from each segmented object in the image and compares each object to each character stored in the character set. OCR returns the objects that best match characters in the character set as the recognized characters

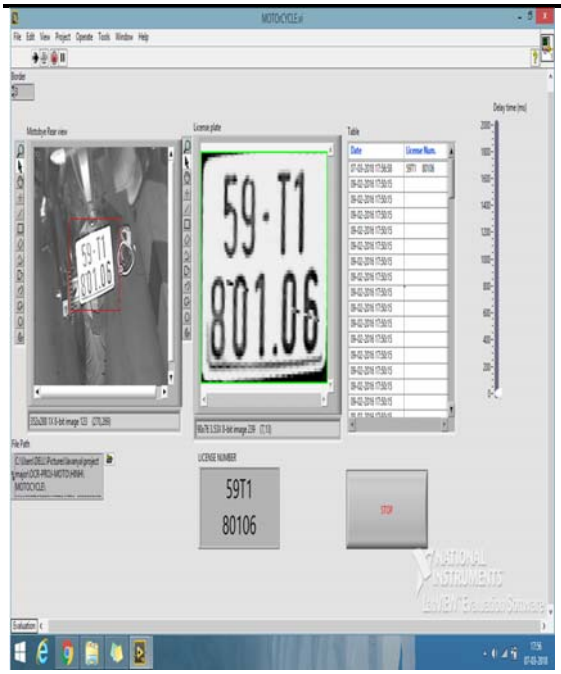
E.**Character Segmentation**: Character segmentation applies to both the training and reading procedures. Character segmentation refers to the process of locating and separating each character in the image from the background

F. **Thresholding**: Thresholding is one of the most important concepts in the segmentation process. Thresholding is separating image pixels into foreground and background pixels based on their intensity values. Foreground pixels are those whose intensity values are within the lower and upper threshold values of the threshold range. Background pixels are those whose intensity values lie outside the lower and upper threshold values of the threshold range. OCR includes one manual method and three automatic methods of calculating the thresholding.

Range: Fixed Range is a method by which you manually set the threshold value.. The following three automatic thresholding methods are affected by the pixel intensity of the objects in the ROI. If the objects are dark on a light background, the automatic methods calculate the high threshold value and set the low threshold value to the lower value of the threshold limits. If the objects are light on a dark background, the automatic methods calculate the low threshold value and set the high threshold value to the upper value of the threshold limits.

III .RESULTS





IV. CONCLUSION

The process of vehicle number plate recognition requires a very high degree of accuracy when we are working on a very busy road or parking which may not be possible manually as a human being tends to get fatigued due to monotonous nature of the job and they cannot keep track of the vehicles when there are multiple vehicles are passing in a very short time .To overcome this problem, many efforts have been made by the researchers across the globe for last many years. A similar effort has been made in this work to develop an accurate and automatic number plate recognition system. We have used Vision assistant 8.2.1 along with LabVIEW 11.0 to obtain the desired results. The setup has been tested for vehicles containing different number plates from different states. In the process of final evaluation after optimizing the parameters like brightness, contrast and gamma, adjustments, optimum values for lightening and the angle from which the image is to be taken. We get an overall efficiency of 98% for this system. Though this accuracy is not acceptable in general, but still the system can be used for vehicle identification.

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