



NUMBER PLATE DETECTION USING OPENCV

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Abstract

Vehicle License plate detection systems have a variety of applications in day to day life such as finding a theft car, checking of unauthorized entry, filling the tools, parking system etc. The vehicle detection API is built by first capturing the image from a source and then this captured image is loaded into our java API which preprocesses that given image to give us the required plate area. There are a lot of detection techniques available which gives the accuracy of certainly around 85-90%.

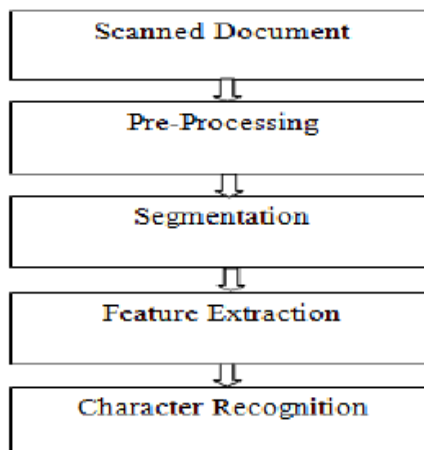
Keywords: License plate detection, API.

Introduction

Number plate reorganization is used in order to identify the vehicles precisely. Each vehicle has their different number which makes them distinguishable. The vehicle identification number is actually their license number which states to have a legal license participate in the public area. Therefore the technique of detection of a number plate plays a very important role. One of the most important tool for doing this is given by open source community is opencv which is a computer vision tool. All the vehicle should have the license number and the license plate should be properly mounted, readable and visible in order to recognize it clearly.

1. Proposed System

In country like India we have two types of number plate i.e. one is a white background with black colored numbers and other one is yellow background with black numbers. The block diagram for the system proposed by us is as follows:



1. A) Image Acquisition

With the help of certain cameras of high quality an image is captured and then fed into the API tool to further processing.

The best possible number plate location is found out by comparing width by height factor of actual Indian number plates to the same factor of plate like areas found by this method. Maximum efficiency is shown by the system when the width by height factor is set between 3 and 7.

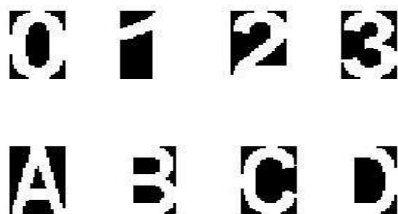
1. B) preprocessing of the Image

The main operation of this process is to perform the scanning on the input image. This process actually enhances the input image for the segmentation. The role of this process is to segment the patterns from the background such as removing noise, smoothing, filtering. These steps are followed in this

1. C) Segmentation

In the segmentation process, the long string of image which contains characters is divided into the number of images which contains the individual characters. The input image which is

pre-processed is converted into individual characters and assigning the numbers using a labelling process. And this labelling process provides the information the character of the image. After extracting the image we have to normalize the size of the image.



Templated used for template matching. Template matching method is used for classifying objects these are generally used for identifying the printed numebners. Generally in templates method are correlated in the source image. Correlation is the measure of degree in which two variable agrees. The correlation is between -1 and +1. Higher the correlation stronger is template matching.

TEMPLATE MATCHING

The used templates are given in the figure below:



1. D) Feature extraction

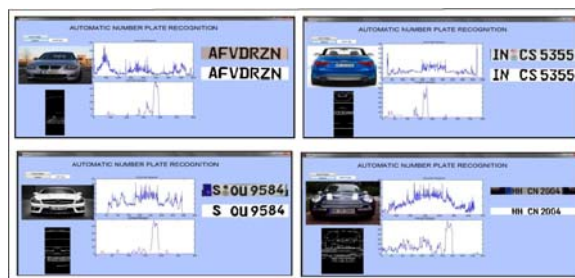
The most important step of the number system is to extract the characters from the plate. It is necessary to visualize the basic characteristics of the image but also to minimize the number of dimensions and also to reduce the computation. The main purpose of feature extraction is to identify the various characters and the high dimensional features.

1. E). Character reorganization

The character reorganization is the last step of license plate recognition. The main part of the reorganization process is the accuracy and the recognition. It gives 85-90% accuracy to the

system and it recognize the character of the license plate number. Before reorganization the license plate number the characters has to be normalized. Generally we use normalization in order to improve the image character into the block with the white space in all four sides of the character. In this stage license plate character are taken from the license plate to recogninze. It is the actual process to recognize the character.

2. Result



3. Conclusion

License plate reorganization play an important role in our life as it avoids many crime like vehicle theft, parking congestion, burglary. In LPR image of the vehicle plate is captured and is recognized by using various algorithms so that the information can be easily detected the identity of the owner. The image of the license plate is captured and noise reduction is done in order to get a better result. Segmentation and reorganization is done using the template matching. In this way we can detect the number plate.

4. References

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