

VEHICLE NUMBER PLATE DETECTION & ITS APPLICATIONS

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Abstract - Enormous number of vehicles around us in every day life makes aggravations like hefty traffic, taking of vehicles at the spots like cost courts, leaving regions, substantial traffic streets. The board of vehicles transportation is drawn-out and tedious undertaking on the off chance that it is totally done physically and which brings about tremendous blunders and blames. In this way, propose a number plate recognition system using image processing technique with GSM technology based automatic alert. The image processing steps of OCR based segmentation used for number plate extraction. The corresponding number matched with data base and security alert send in case of any theft happened.

KeyWords: OCR segmentation, Localisation, Template matching, character recognition, GSM

1. INTRODUCTION

License Plate Recognition (LPR) is a PC vision strategy used to differentiate automobiles with the number plates. During late years, LPR have been broadly utilized as a center innovation for security or traffic applications, for example, in rush hour gridlock reconnaissance, parking garage access control, and data the board.

Automatic license/number plate recognition is a particular use of optical character recognition. Normally utilized by law implementation organizations, the utilizations for automatic license plate recognition have developed hugely since its presentation. Automatic license plate recognition might be utilized to refer to people who abuse traffic lights or drive in abundance of as far as possible, as a strategy for electronic cost assortment, to put a suspect at a scene, or recognize uninsured driver.

Additionally there is a test in its application in light of the fact that various nations have various kinds of license plates where configuration, shading, text style and size of textual styles fluctuate and Latin characters and numerals have various blends.

2. Related Work

Islam et al 2015 presents a prosperous strategy to distinguish vehicle number plates. The proposed method is based on morphological tasks dependent on various organizing components to maximally bar noninterested district and improve object territory.

Huang et al 2018 proposes another system for vessel plate number location and acknowledgment in common scene pictures. This paper presents a brought together start to finish teachable profound organization, which can at the same time find and perceive the vessel plate number.

Yuan-yuan, et al 2009 have proposed a technique for number-plate characters acknowledgment utilizing AdaBoost calculation, which dependent on layout coordinating is introduced to improve acknowledgment rate and diminish acknowledgment time.

Lin et al 2019 have proposes a lightweight and superior multi-point tag character acknowledgment model, which lessens the intricacy and computational intricacy of conventional tag acknowledgment. This paper likewise gathers countless tag pictures from various conditions, points and sizes as preparing information.

Astawa et al 2018 have study the character affirmation of vehicle number plates using Convolutional Neural Network (CNN) is one of the significant learning systems. The character affirmation measure is recognized by the division collaboration, which is taking the characters in the number plate.

Liu Ying et al 2008 plans a total tag acknowledgment framework. It is made out of picture preprocessing, the tag situating and division, characters cutting, highlight extraction and character acknowledgment.

Tejas et al plan a structure which gets the image of the number plate of a vehicle using a camera and the nuances are being recuperated using the character division which is done by a component extraction optical character affirmation estimation (OCR).

Ghosh et al 2018 have propose a 'locale of-interest (ROI)'- based separating strategy to find the up-and-comer areas of number plate (NP) event. In the proposed separating technique, competitor areas are situated in the NP picture by recognizing vertical edges, eliminating long edges and fixed locales.

Gorovyi et al 2015 have proposed a novel calculation. The methodology depends on the discovery of text territories utilizing the stroke width change. More plate up-and-comers are identified utilizing the explicitly evolved picture preprocessing plan dependent on set of morphological administrators and form examination.

Yim et al 2018 have propose an incorporated arrangement of recognizing a vehicle's plate number and connecting it with its quick speed. Test results represent a moderately higher level of plate number recognizable proof and acknowledgment and over speeding recognition.

3. Proposed System

The proposed system consist of both image processing steps and hardware units. In image processing steps, the basic steps of preprocessing or noise removal, feature extraction and classification carried out . In hardware step arduino hardware combined with GSM technology used

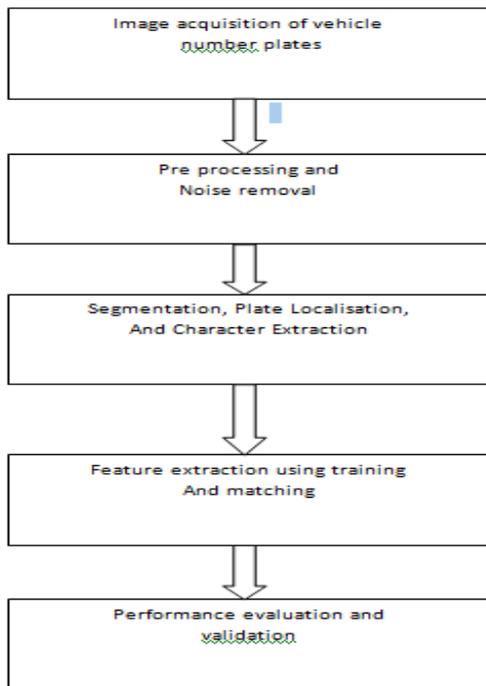


Figure 3.1 Proposed work flow

A) Pre-processing and Noise expulsion

The image obtained from road side offers high noise and less resolution in clarity. In order to improve processing capability, processing of noise removal carried out with filters .

B) Plate Localisation and Segmentation

In image processing , segmentation is process of extracting object or important portion form background. Here , OCR segmentation applied to extract number from number plate.

C) Feature extraction and Matching

Template matching performed to compare extracted number features with stored features.

D) Euclidean distance used to measure distance from extracted number to original numbers.

3.1 Hardware Architecture

The proposed hardware setup consist of arduino controller with GSM technology. The final result processed from raspberry pi allowed to arduino controller. The arduino controller compare the numbers with data base to identify vehicle theft. In case of detection of theft, SMS alert send to stored numbers.

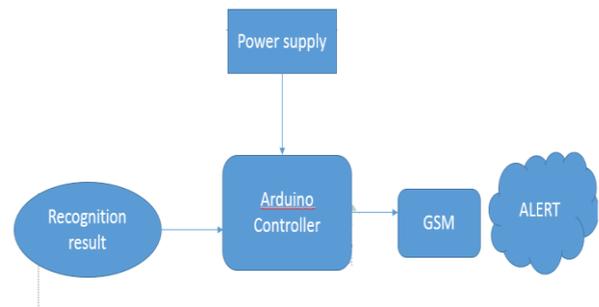


Figure 3.1.1 Proposed hardware architecture

4. Results and Discussion



Fig 4.1 Input image

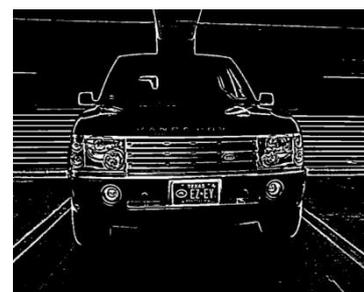


Fig 4.2 Binary image(noise removed)

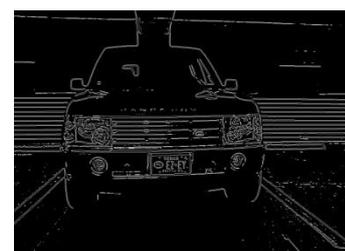


Fig 4.3 Image after segmentation



Fig 4.4 Plate localized image



Fig 4.5 Extracted numbers after template matching



Fig 4.6 Detected numbers from the number plate of car

Thus using the methods such as OCR, segmentation, plate localization, Feature extraction and template matching the number plate is detected.

5. CONCLUSIONS

The proposed arduino based vehicle theft detection system implemented successfully. The proposed system effectively extract number from vehicle image and automatic alert send to predefined numbers. It very well may be utilized in numerous security purposes like speed identification, discovery of criminal traffic offense, cost assortment, stopping framework also as can be introduced at secure regions like at the entryway of the local location, production line doors, parking spot, cost squares, college entrance or other high-got building, for example, guard foundations, atomic plants.

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