

Review on Automatic Number Plate Recognition Techniques

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Abstract- Automatic Number plate recognition (ANPR) is the main module of advanced driver assistance system and has been employed in many security applications by government of different countries. This paper presents the review on several number plate recognition techniques implemented. The ANPR module is playing a vital role in different applications such as traffic monitoring, detection of stolen vehicles, automatic payments of tolls and parking etc. A number of tasks can be accomplished with the ANPR systems. This paper describes some ANPR techniques.

Keyword : ANPR, Segmentation, Recognition, Preprocessing, SVM.

1. INTRODUCTION

The development of Intelligent Transportation system has grown rapidly over the last two decades with the progress of the computer vision technologies. PC vision is the science and advancement of machines that see and get it. As an exploratory order, computer vision is apprehensive with the counterfeit frameworks that concentrate data from pictures and recordings. The picture information can take numerous structures, for example, video groupings, sees from different cameras and so forth. Computer vision is comprehended as a sub space of the computerized reasoning furthermore software engineering fields. Alternate ranges most firmly identified with computer vision are picture handling, picture examination and machine vision.

Major applications of computer vision are: Surveillance systems, Gestures understanding, Sign Language understanding, Face Recognition, Road Monitoring, Biometrics, Planetary Exploration, Industrial Inspection, Autonomous Driving, Robotic Control, Medicine, Docking, Military, Remote Sensing, Automatic perusing of information or data from archives, Objects recognition and so on. The other important area of computer vision application is open for research is Automatic Reading of Number plates from vehicles.

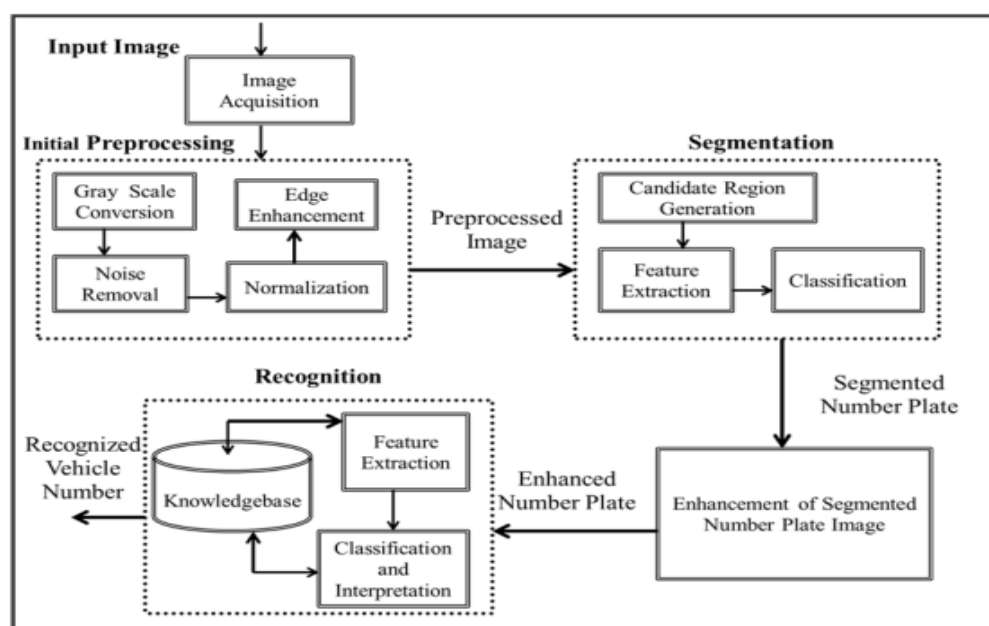


Fig.1 Block diagram for Automatic Number Plate Recognition System

2. ANPR SYSTEM

An ANPR system consists of three stages: Number plate extraction, character extraction and character recognition. The purpose of this review paper is to provide researchers a survey of existing ANPR approaches.

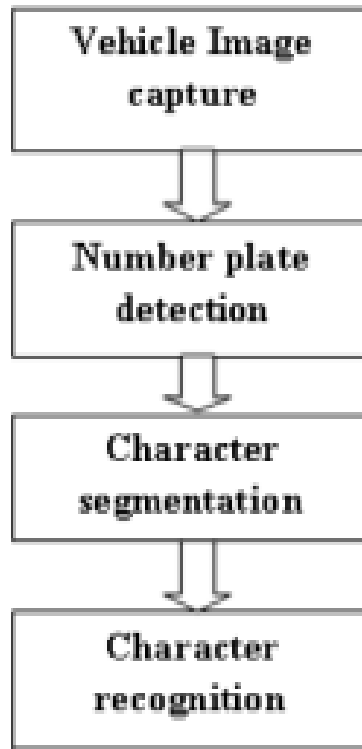


Fig. 2 ANPR System

3. LITRATURE SURVEY

Literature Survey For the past several years, there has been an increasing interest among researchers in the problem related to extracting text from video. Intensive research has been carried out in this area, which is evident from large number of technical papers.

One such application is locating the number plate in a video.

Zoe Jeffrey, Xiaojun Zhai et al., have proposed a method of Automatic number plate recognition system based on ARM-DSP. The arithmetic capability of digital signal processors (DSPs), the multiple peripheral interfaces and the high frequency execution of the ARM processors make them an attractive choice for real time embedded systems. DSPs are already widely used for applications such as audio and speech processing, image and video processing, and wireless signal processing. Practical applications include surveillance, video encoding and decoding, and object tracking and detection in images and video.

On the other hand, rapid development of Field Programmable Gate Arrays (FPGAs) offers alternative way to provide a low cost acceleration for computationally intensive tasks such as digital signal processing. Most of these applications use ARM, DSPs and FPGAs due to the processing power offered, in order to provide portability and real-time capability, and create custom embedded architectures for different application requirements. The main goal of this work is to design and implement efficient and novel architectures for automatic number plate recognition (ANPR) system using ARM-DSP System-on-Chip platform, which operates in high definition (HD) and in real time. In addition, a separate ANPR algorithm is developed and optimized, by taking advantage of technical features of FPGAs which accelerate digital image processing algorithms. The investigation of the algorithm and its optimization focused on real time image and video processing for license plate (LP) or number plate localization (NPL), LP character segmentation (NPS) and optical character recognition (OCR) in particular, which are the three key stages of the ANPR process. ANPR often forms part of an intelligent transportation systems. Its applications include identifying vehicles by their number plates for policing, control access and toll collection.

The distance at which a vehicle plate could be identified using a specified lens at maximum zoom is provided in the work by Mike Constant [10]. The distance can vary from 100 meters to 300 meters in some cases. The common guidelines suggest that, to read a number plate, the car should be 50% of the screen height. The height of the vehicle is assumed as 1.5 meters and the size of the lens as 7.5-75 mm.

Michael Lidenbaum et al. has concocted a calculation for moving auto tag acknowledgment. He has built up a model framework, which is equipped for perceiving a tag number. The acknowledgment will be performed continuously, watching autos going at low speed before video recording gadget. Initially, a video is gone up against a sunny day with conventional camera settings. Amid the improvement, he finished up, that the present picture quality is astounding for first errand, cutting tag containing outlines, yet the second part, number acknowledgment was practically inconceivable on account of the accompanying reasons: The photos were taken with typical presentation time that caused smoothing of picture when all is said in done and a number specifically. The number was too little and excessively couple of pixels accessible, making it impossible to break down.

The photo with little introduction time likewise was not utilized on the grounds that the dynamic scope of the photo was too little for dependable location of yellow shading. The worthy nature of the photo was accomplished when the tradeoff between introduction time and dynamic fierceness was considered. The articles are indeed, divides from the first picture having a higher normal differentiation measure. Specifically (extraordinary lighting conditions, distinctive hues, diverse separation from the camera, and so on), the zone containing the auto tag number turns out to be one of these articles. Once the intrigue ranges are in this manner divided, they are intelligently binarized (with the guide of some measurable strategies and utilizing a few test focuses), and go for facilitate division to the acknowledgment/preparing subsystem. The acknowledgment/preparing subsystem depends on an exclusive approach in the field of hyper circle classifiers which drove us quite a while prior to a neural like innovation, sufficiently simple to be executed even on moderately moderate PC frameworks. This innovation includes a high level of commotion resistance and speculation control. It basically permits learning and further acknowledgment of any graphical image.

4. METHODOLOGY

There are several methodologies for the number plate recognition. Following are the stages of number plate recognition:

1. Plate Localization
2. Preprocessing
3. Characters and Numbers segmentation
4. Feature extraction from segmentation characters and numbers
5. Recognize the extracted feature
6. Character recognition using template matching.

5. CONCLUSION

The basic techniques for the number plate recognition have been studied in the paper. The future work can be proposed for making it a generalized system for the number plate recognition i.e. training based approach can be applied in the future. Also it can be done for the different environmental conditions.

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