Number Plate Extraction from Vehicle Front View Image using Image Processing

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Abstract — *As the population increases, the drastic growth in the transportation also increases. While increasing vehicle there is a possibility of occurring accident due to huge traffic zone. To overcome this problem certain measures has to be taken. Many automatic auditing systems are gone through for precaution. By this faulty drivers who drive rashly, brake the law of traffic rules, invoke to accident those people can be identified and punished. This paper presents algorithms for vision-based detection and classification of vehicles in video sequences of traffic scenes recorded by a stationary camera. Different from other shape based classification techniques, we exploit the information available in multiple frames of the video. This approach eliminates most of the wrong decisions which are caused by a poorly extracted silhouette from a single video frame. The decision boundaries in the feature space are determined using a training set, whereas the performance of the proposed classification is measured with a test set. To ensure randomization, the procedure is repeated with the whole dataset split differently into training and testing samples.*

1. INTRODUCTION

Application of computer vision paves the way for vehicle detection and identification from a digital forensic video since it allows the identification of individual vehicles and extract the parameters related to each vehicle such as location, registration number, colour, type simultaneously. In general, the information that can be extracted through this system can be used effectively to find the suspect vehicle in a high traffic flow and also recognize the number plate of the vehicle.

Due to recent progress in object detection, tracking and detection has become the leading paradigm in multiple object tracking. Within this paradigm, object trajectories are usually found in a global optimization problem that processes entire video. The number of on-road motor vehicles has increased with the rapid growth of world's economy and with this augmentation the need for security and monitoring of vehicles has also increased. Many successful commercial systems that employ dedicated camera systems, providing video input captured under control environments to ANPR algorithms. However, application scenarios in video surveillance and forensics such as tracking down a stolen vehicle or searching for a vehicle involved in a crime, as identified by a bystander to be of a particular registration number, requires the painstaking task of manual search, because the existing ANPR systems are not capable of efficiently working on video footage obtained via non-dedicated (for ANPR) CCTV systems.

There is interest in vehicle tracking and identification due to its applications for identifying the suspect vehicle and for public safety. There is interest in vehicle tracking due to its applications for public safety and traffic monitoring. Vehicle tracking can be used by law enforcement to track criminals in cases of Amber Alerts and also suspect involved in other criminal activity.

This main objective of this project is to provide efficient and robust framework that can perform tracking, identification and recognition of multiple vehicle and their license plates in a real-time scenario (i.e., incoming video stream from CCTV surveillance cameras). Also, this technology is used in suspecting criminals, obtaining information about the criminal vehicles from a captured forensic video.

2. PROPOSED SYSTEM

For each feature, it finds the best threshold which will classify the Vehicle to positive and negative. But obviously, there will be errors or misclassifications. We select the features with minimum error rate, which means they are the features that best classifies the vehicle and background images. The process is not as simple as this. Each image is given an equal weight in the beginning. After each classification, weights of misclassified images are increased. Then again same process is done. New error rates are calculated.

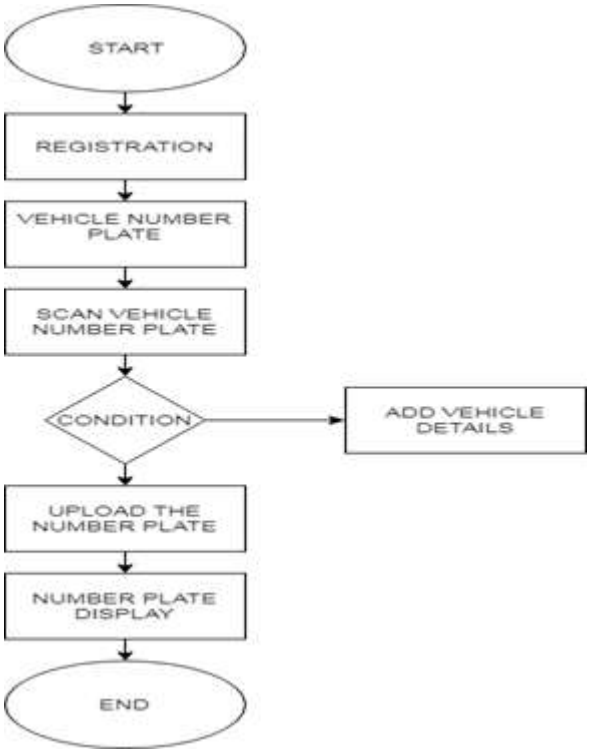

Fig – 1: Flow chart

The process is continued until required accuracy or error rate is achieved or required number of features are found).

• **Camera(s)** - that take the images of the car (front or rear side)

• **Illumination** - a controlled light that can bright up the plate, and allow day and night operation. In most cases the illumination is Infra-Red (IR) which is invisible to the driver.

• **Computer** - normally a PC running Windows or python. It runs application which controls the system, reads the images, analyzes and identifies the plate, and interfaces with other applications and systems.

• **Software** - the application and the recognition package. Usually the recognition package is supplied as a DLL (Dynamic Link Library).

• **Hardware** - various input/output boards used to interface the external world such as control boards and networking boards.

Fig 1 represents the flow chart of number plate display which describes firstly, all the vehicle number plate is registered in the record. The number plate can be scaned, while scanning the recorded details of the users will uploaded.

3 RECOGINITION OF NUMBER PLATE

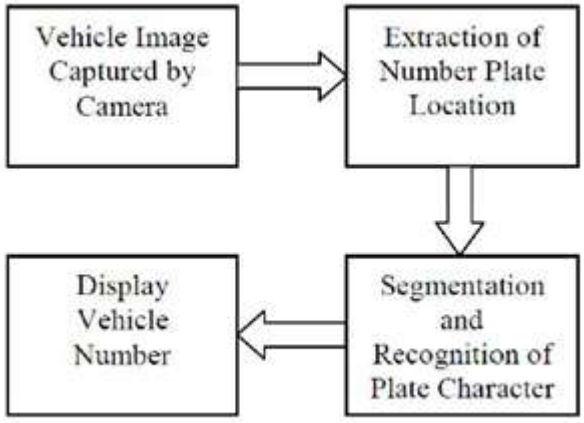

Fig-2: General block diagram of recognition of plate

Fig-3: Image captured by camera. (Input image)

The picture of the vehicle whose number plate shown in image given below as fig 3 is to be recognized is caught utilizing an advanced camera of 13 megapixels. In this progression, the color image which contains a number plate of a vehicle is transformed into Gray-Scale. Here scientific morphology is used to detect the area along with Sobel edge operations that are utilized to calculate the edge boundary. After this, we obtain a dilated picture. At that point, infill function is utilized to fill the gaps with the goal that we get a reasonable binary image.

For segmentation of the characters, the bounding box approach is utilized. It is used to gauge properties of the Image at the region of interest. The essential step in acknowledgment of the number plate is by recognizing the plate features and size. Here the extracted image is multiplied by the grayscale picture with the goal that we only obtain the number plate area in the picture of the vehicle. After performing the above every steps the number plate which is segmented and extracted is converted into thetext from and displayed in MATLAB window.

4. RESULT

We have run our proposed method on desktop computer several vehicle images are taken using 1.3 mega pixel camera as well as 12 mega pixel cameras. In the experiments, we test our proposed method on the different type car image to identify the location exactly.

5. CONCLUSION

An efficient less time consuming vehicle number plate detection method is projected which performed on multifaceted image. By using, edge detection method here detects edges and fills the holes less than 8 pixels only. To removing the license plate we remove connected components less than 1000 pixels. Our anticipated algorithm is mainly based on Indian automobile number plate system. Extraction of number plate accuracy may be increased for low ambient light image.

ACKNOWLEDGEMENT

We would like to thank Dr.Byrareddy C.R, Professor of E & C department, Bangalore Institute of Technology and Santhosh kumar, Senior Research Staff of CRL BEL, for his technical help on this paper.

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