

Recognition of Indian License Plate Number from Live Stream Videos

Pradeep Avale¹, Prof. S.G. Bari², Prof. Priti Rajput³

^{1,2,3}Department of electronics and telecommunication, D.Y.Patil school of engineering Academy Ambi, Talegaon, Maharashtra, India

Abstract - In recent times there is vast amount of increase in number of vehicles and road networks. Due to this need for monitoring traffic has become major issue. A number of different techniques on traffic management and surveillance are employed for traffic management. In this context the quantity plate reputation is one of the most important strategies for dealing with the traffic using digital techniques. Automatic Number Plate Recognition (ANPR) system as a one of the solutions to this problem. In India often License plates with regional fonts are also used which adds to complexity of detecting license plate as system needs to be trained for each region. In this provided work a survey on automated quantity plate recognition technique is presented. In this paper we do a study of the existing ANPR systems. Additionally Open ALPR, k-NN and Convolutional Neural Networks (CNN) based techniques are selected for accurate estimation of number plate recognition.

Keywords - Traffic Management, Image Processing, Open ALPR, k-NN and Convolutional Neural Networks (CNN)

1. INTRODUCTION

India is a developing nation and headway is pondered various things. In most recent 10 years the way of life and way of life of each Indian in quickly changed. What's more of that so as to coordinate with the present way of life various things are additionally associated with our way of life. Among these way of life items the vehicle is turned out to be a standout amongst the most fundamental piece of our life. Be that as it may, the effect of this quick and rich way of life is happened in various territories, for example, leaving spots and traffic around us. So as to manage this expanding traffic and the up and coming traffic various methods and the executive's abilities are utilized. Among them the programmed vehicle number plate acknowledgment is a necessity of new age traffic the board and control.

Closed Circuit Television Camera (CCTV) cameras are used for monitoring traffic which increases efficiency compared human monitoring. The drawback with CCTV cameras is low resolution. ANPR give a way to beat the downsides and insufficiency of fruitful observation of the CCTV cameras. — Automatic license plate recognition system involves extracting the license plate from a vehicle and using it for various purposes. ANPR algorithms consist of Vehicle image capture, Number plate detection, Character segmentation and Character recognition. ANPR is an advanced machine vision technology used to identify vehicles by their number plates without direct human intervention. ALPR is also known as automatic vehicle identification, car plate

recognition, automatic number plate recognition, and optical character recognition (OCR) for cars. The vast majority of the number plate identification calculations fall in more than one class dependent on various methods. To distinguish vehicle number plate following variables ought to be considered: (1). Plate measure: a plate can be of various size in a vehicle picture. (2). Plate area: a plate can be found anyplace in the vehicle. (3). Plate foundation: A plate can have diverse foundation hues dependent on vehicle type.

2. PROBLEM STATEMENT

License plates are carefully kept up in developed countries. A specific layout for license plate is pursued and summed up where it is obligatory to pursue a similar layout for each vehicle. In India frequently License plates with territorial textual styles are likewise utilized which adds to multifaceted nature of identifying license plate as framework should be prepared for every district. Each vehicle has unique number represented by license plate characters. It includes information about the state, state code for district within particular range followed by two letters and four digits. License plate recognition system can be influenced by weather conditions, vehicle movement, damage caused to license plate, movement of vehicle, lighting condition, the location of license plate within an image. In this paper some techniques of number detection techniques are explored and finally a new model for accurate recognition is proposed.

3. Literature survey

In this section, we present a brief literature review describing ALPR work.

Badr et al. [1] It consist of Automatic License Plate Recognition System (ALPR) using Morphological operations, Histogram manipulation and Edge detection techniques. Artificial Neural Networks are used for character classification and recognition Drawback is that it has worse recognition rate for blurry and skewed snapshots

Sundaraman et al. [2] this paper proposes ALPR using Raspberry Pi. It makes use of multimedia based approach for both localization and recognition of license plate. This introduces a Completely Automated License Plate Recognition system using the Optical Character Recognition (OCR) The image of the Vehicles License plate is captured and is processed by the segmentation of the characters and is verified by the Raspberry Pi. Difficulty with this approach is that amount of processing time it takes.

Khushboo Chhikara, Dr.Pankaj Tomar[3] proposed multimedia approach for both localization and recognition of license plate. In this details of the image are being retrieved using the character segmentation which is done by optical character algorithm. The system is executed on Raspberry Pi and imitated in MATLAB .Result showed the system fast enough but disadvantage is it cannot be implemented on large scale because of processing power of Raspberry Pi. Garcia et.al [4] describe an approach which relies on analysis and extraction of contours formed due to vision surrounded by environment. The benefit is image based self-navigation but on account of drift in flight time.

Sarbjit and Sukhvir [5] presented a method of recognition of license plate based on thresholding and sobel edge detection. Drawback was to identify for license plate at an angle. Wawage and Oza [6] proposed recognition system to detect license plate using classification algorithm. Character recognition based on neural network approach also works well for license plate [7], [8], and [9]. Neural Network directly operates on image pixels involves unified approach that integrates localization, segmentation and recognition steps, while traditional approach separates these steps. CNN's can be fine-tuned to work under different conditions i.e. robust under variations in lighting, occlusion etc. Ortiz et.al [10] proposed an approach to detect license plates and recognition using deeply learned convolutional neural network for localization and recognition of license plate. It can work across different variety of license plate templates (e.g. Background, font, size. The system is compared with Open ALPR which result in more accuracy.

4. PROPOSED WORK

Proposed work is as given below:

The dataset involves still images of Indian license plate vehicles and video of vehicles captured at traffic junction. The given video is spilt into frames for recognition. Synthesize license plates and subjected to training. The License plate within given frame will be recognized with help of trained model. It involves character recognition within License plate.

Each frame is read and stored in file system subjected for license plate recognition. It will consist two steps.

A. License plate recognition with with k-NN (LPRI)

Detect License plates in given Image - Given an image first step is will be find license plates within an image. It is followed by preprocessing, thresholding, edge detection and noise removal. It will find possible number of license plates within image or frame.

Detect Characters in License plate -Once license plate is extracted, next step is to find the characters in the plate. It will result in recognition of license plate along with characters in an image.

B. License Plate recognition with Open ALPR

It uses Local Binary Pattern. Open ALPR will be trained to recognize vehicle depending on country using the pattern of license plate.

C. License Plate recognition with CNN-It will consist sliding window approach with neural network.Next step will be analyze result of each approach. The accuracy of each approach will be measured in terms of characters recognized and time taken for character recognition. It will predict accurate approach among three approaches.

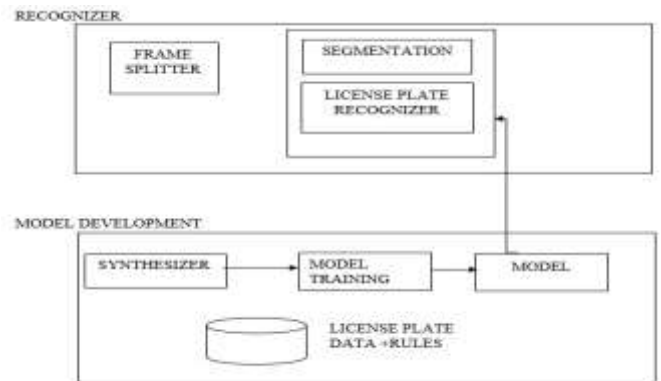


Fig4.1:- Block Diagram

5. Results:

1. Number Plate Recognition:-

In This Section, We Shall Analyze Result For Each Approach Considering Still Images Of 200 And 250 Frames In Case Of Video For Indian License Plates. Still Images of Parked Indian Vehicles Are Considered While Frames Belong To Video Acquired

At Traffic Signal Junction. The Results Involve Two Aspects I.E Localization Of License Plate And Character Recognition.



Fig5.1:- Snapshot of recognized Number

Database--: Create Our Own Database Of 16 different Images Which Can Be Stored In Memory To Identify The Different Number Plates.



Fig5.2:- Database of Synthesized images

6 .Conclusions

The presented work can be concluded using the following points:

1. Paper first includes the different recent contributions placed in order to recognize the number plate automatically
2. Paper also includes the different techniques that are frequently used for automatic number plate recognition systems
3. Different approaches for estimating accuracy of the detection are defined.
4. The Convolutional Neural Network approach is suitable technique for recognition of Indian license number plate's CNN approach recognizes particular fonts.it has maximum Accuracy and adaptable.it also recognizes license plates from CCTV footage.

References

[1] Badr, Amr, Mohamed Mahmoud Abdelwahab, Ahmed Mohamad Thabet, and Ahmed Mohamed Abdelsadek. "Automatic license plate recognition system." *Annals of the University of Craiova Mathematics and Computer Science Series* 38, no.1 (2011):62-71.

[2] Sundararaman, Vijayaraghavan, T. G. Vijayalakshmi, G. V. Swathi, and Sambit Mohapatra. "Automatic License Plate Recognition System Using Raspberry Pi." In *Proceedings of the International Conference on Recent Cognizance in Wireless Communication & Image Processing*, pp. 217- 222. Springer India, 2016.

[3] Khushboo Chhikara, Dr.Pankaj Tomar - " A Smart Technique for Accurate Identification of Vehicle License plate Using MATLAB and Raspberry Pi 2", www.ijetmas.com May 2016, Volume 4, Issue 5, ISSN 2349-4476

[4] Garcia, Adriano, Edward Mattison, and Kanad Ghose. "High-speed vision-based autonomous indoor navigation of a quadcopter." In *Unmanned Aircraft Systems (ICUAS), 2015 International Conference on*, pp. 338-347. IEEE, 2015.

[5] Sarbjit Kaur Sukhvir Kaur - "An Efficient Method of License plate Extraction from Indian Vehicles Image" *International Journal of Computer Applications* (0975 - 8887) Volume 88 - No.4, February 2014

[6] Wawage, Pawan, and Shraddha Oza. "Design Approach for Vehicle License Plate Automatic Detection and Character Recognition System Using Classification Algorithm." *International Journal of Emerging Technology and Advanced Engineering* 2, no. 10 (2011): 132-135.

[7] Kodabagi, M. M., and Vijayamahantesh S. Kanavi. "License Plate Recognition System for Indian Vehicles." *International Journal of advance research in Engineering and technology (IJARET)* 2 (2013).

[8] Goodfellow, Ian J., Yaroslav Bulatov, Julian Ibarz, Sacha Arnoud, and Vinay Shet. "Multi-digit number recognition from street view imagery using deep convolutional neural networks." *arXiv preprint arXiv: 1312.6082* (2013).

[9] Fabian Stark, Caner Haz_rba_s, Rudolph Triebel, and Daniel Cremers "CAPTCHA Recognition with Active Deep Learning."

[10] Masood, Syed Zain, Guang Shu, Afshin Dehghan, and Enrique G. Ortiz. "License Plate Detection and recognition using RecognitiUsing Deeply Learned Convolutional Neural Networks." *arXiv preprint arXiv:*