International Conference on Advances in Materials, Computing and Communication Technologies
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 1 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

License Plate Recognition Based On Probabilistic Neural Network

N. Sangeetha[1], Dr. A. Anitha[2]
[1]Department of IT, Francis Xavier Engineering College, Tirunelveli, Tamil Nadu, India
[2]Professor, Department of IT, Francis Xavier Engineering College, Tirunelveli, Tamil Nadu, India

ABSTRACT

This project presents a novel image processing system for Indian number plate detection and recognition that can deal with, noisy, low illuminated, cross angled, non-standard font number plates. This work employs several image processing techniques such as, morphological transformation, Gabor smoothing, and Gabor thresholding in the pre-processing stage.
Next, for number plate segmentation, contours are applied by border following and contours are filtered based on character dimensions and spatial localization.
Finally, after the region of interest filtering and Probabilistic neural Network algorithm is used for character recognition. The proposed methods demonstrated promising results using Matlab software.
Keywords: Probabilistic Neural Network classifier, Gabor filter, Fuzzy C

I. INTRODUCTION

License Plate Recognition (LPR) is a computer vision method used to detect vehicle using the license plate. During recent years, License Plate Recognition have been widely used as a core technology for security or traffic applications such as

- Traffic surveillance
- Parking lot access control
- Information management.

This thesis targets at the problem of detecting and recognizing United States license plates from images and videos in real time. This project deals with the Problem of Detecting, Recognizing License plate, Reference for further vehicle tracking, Vehicle activity analysis. Our license plate detection approach has two major steps.

1. First, we need to extract certain features which encode the images or frames from videos.
2. Second, we need develop a detector, which is a classifier in our case, to determine whether a certain region in the images or frames is license plate.
3. Third, ALPR system involves capturing the image from a digital camera, pre-processing of the image to remove noise and make the image suitable for character segmentation and thereby character recognition.
4. An image of the vehicle is captured and the license plate is extracted. Once the characters are recognized, the user is allowed to manage the system using a GUI.

II. LITERATURE SURVEY

1. **'Multinational License Plate Recognition Using Generalized Character Sequence Detection' & Chris Henry et al ' [2020] IEEE.**

Methodology used in this paper is Automatic license plate recognition (ALPR) is generally considered a solved problem in the computer vision community. Advantage of this paper by using YOLO algorithm layouts bounding boxes can effectively extract the correct sequence of LP number from an image. Drawback of this paper Increase time consumption

2. **'Faster R-CNN Towards real time objects detection with region proposal networks' & S.Ren,K.Hee,R.Girshick [2017] IEEE.**

This project based on RPN network and faster RCNN neural network for object detection. Advantage of this paper RPN is efficient and accurate region in proposal generation It improves region proposal quality and t overall object detection accuracy .Drawback of this paper is R-CNN do not encode the position and orientation of object. Lack of ability to be spatially invariant to the input data.

3. **'Automatic Vehicle License Plate Recognition Using Optimal K-Means With Convolutional Neural Network for Intelligent Transportation Systems' & Irina Valeryevna Pustokhina et al [2020] IEEE.**

An effective DL based VLPR model using optimal K-means clustering based segmentation and CNN based recognition . Benefits are by using optimal k means algorithm detected and recognized LP has over all accuracy 0.981% . Drawback are Sensitivity to illumination, higher computation time, and absence versatility.

4. **'Visualizing and understanding convolutional netorks' &T.Y.Lin and S.Maji[2016] IEEE.**

The Novel Visualization technique determine Image Net Classification Benchmark by using large convolutional network . Benefits are Visualization Image Net Classification used PASCAL training datasets to obtain better results. There is no clear understanding on ImageNetbenchmark

5. **'A Robust and Efficient Approach to License Plate Detection' & Yule Yuan et al [2017] IEEE.**

Cascaded license plate classifier based on linear SVMs using color saliency features is introduced to identify the true license plate from among the candidate regions. Benefits are Detection accuracy and run-time efficiency, increasing the detection ratio from 91.09% to 96.62%. The license plate is not found among the candidate regions. When the neighborhood of the license plate contains false characters the candidate region is too large.

6. **'Object detection with discriminatively trained part based models' & P.F.Felzenszwalb,R.B.Girshick,D.Mcallester [2010] IEEE.**

In this project they represented high object classes and PASCAL object detection by using latest SVM Both system is efficient and accurate by representing highly variable object classes .SVM model is difficult to understand It is very high., You need a lot of memory to store database size

7. **'Application Oriented license plate recognition' &G.S.Hsu,J.C.Chen and Y.Z.Chung[2013] IEEE.**

This paper represents vehicle license plate recognition by detecting character segmentation & plate detection using MSER detector By using bilayer classifier MSER is proven effective in character

segmentation and improving LPR performance. MSER have limited performance on blurred textured images

8. **'Multigraph matching through affinity optimization with graduated consistency regularization'& J.Yan,M.Cho,H.Zha,[2016] IEEE.**

This project represent multigraph matching method by using Composition Based Affinity Optimization algorithm. Multigraph matching algorithm is effective based optimization procedure achieves higher accuracy They have not presented a definition for consistency.

9. **'Adaptive discrete hyper graph matching'& J.Yan,C.Li,Y.Li[2018] IEEE.**

This paper describes Hypergraph matching method by using high order affinity information cost-effectiveness of our discrete approach methods for high order case These methods cannot ensure a convergence to a fixed discrete solution.

10. **'A new CNN-based method for multi-directional car license plate detection'& L. Xie, T. Ahmad, L. Jin, [2018] IEEE.**

Multidirectional car license plate detection by using CNN based MD-YOLO framework YOLO framework yields new state-of the-art accuracy .It can handle challenging real-world scenarios It occurs poor conditions such as low resolution, terrible illumination, accidental occlusion .

III. PROPOSED SYSTEM

Our proposed system presents a novel image processing system for Indian number plate detection and recognition that can deal with

- Noisy
- Low illuminated
- Cross angled
- Non-standard font number plates.

LPR system consist of three main parts:

1. license plate detection
2. character segmentation
3. character recognition.

Among these three parts the license plate detection (LPD) is the most challenging and crucial stage and also the most difficult part of an LPR system. This is mostly because during this stage we need to overcome various undesired input image conditions such as

- out of focus (blur) images
- undesired illumination
- small size plates
- rotations
- shadows
- different weather conditions.

An automatic number plate recognition solution typically addresses four key issues: 1. Vehicle presence: Is a vehicle present? 2. Plate location: Where is the number plate in the image? 3. Glyph location: Where are the number plate glyphs within the plate? 4. OCR (Optical Character Recognition): What are the characters on the plate? Each of these issues can be addressed in many different ways, and some approaches may address more than one issue at once. In this paper, a novel technique using Finite Ridgelet Transform is presented. The proposed technique can detect plates of different sizes, different illumination conditions, rotations, scales, shadows, and the real world noise. Moreover this procedure was successful for many blurred images.

IV. CONCLUSION

This paper has presented a new technique for effective detection and recognition of LPs. The proposed model operates on three main stages. In the first stage, LP localization and detection process take place using IBA and CCA model. Subsequently, FCM based clustering technique gets executed to segment the LP image and finally, characters in LP recognition. The proposed model can be employed as a major element of intelligent infrastructure like toll fee collection, parking management and traffic surveillance. The proposed model has offered a maximum overall accuracy of 0.981 on the applied dataset.

V. REFERENCES

[1]. 'Multinational License Plate Recognition Using Generalized Character Sequence Detection' & Chris Henry et al ' [2020] IEEE.

[2]. 'Faster R-CNN Towards real time objects detection with region proposal networks' & S.Ren,K.Hee,R.Girshick [2017] IEEE.

[3]. 'Automatic Vehicle License Plate Recognition Using Optimal K-Means With Convolutional Neural Network for Intelligent Transportation Systems' & Irina Valeryevna Pustokhina et al [2020] IEEE.

[4]. 'Visualizing and understanding convolutional netorks' &T.Y.Lin and S.Maji[2016] IEEE.

[5]. 'A Robust and Efficient Approach to License Plate Detection' & Yule Yuan et al [2017] IEEE.

[6]. 'Object detection with discriminatively trained part based models' & P.F.Felzenszwalb,R.B.Girshick,D.Mcallester [2010] IEEE.

[7]. 'Application Oriented license plate recognition' &G.S.Hsu,J.C.Chen and Y.Z.Chung[2013] IEEE.

[8]. 'Multigraph matching through affinity optimization with graduated consistency regularization'& J.Yan,M.Cho,H.Zha,[2016] IEEE.

[9]. 'Adaptive discrete hyper graph matching'& J.Yan,C.Li,Y.Li[2018] IEEE.

[10]. 'A new CNN-based method for multi-directional car license plate detection'& L. Xie, T. Ahmad, L. Jin, [2018] IEEE.