International Journal of Future Generation Communication and Networking
Vol.14, No. 1, (2021), pp. 4777 - 4783

# Number Plate Detection and Parking Allocation

**Shivram Patkulkar[1], N.M. Wagdarikar[2], N.S. Kawathekar[3], Akhouri Nishant Sinha[4], Sagar Sonkamble[5]**

*[1,2,3,4,5,] Dept. Of E&TC Engg., Smt.Kashibai Navale College of Engineering, Pune, Savitribai Phule Pune University, Pune*

*[1]spatkulkar31@gmail.com*
*[2]nmwagdarikar@sinhgad.edu*
*[3]nachiketkawathekar_skncoe@sinhgad.edu*
*[4]akhourinishantsinha@gmail.com*
*[5]sagarsonkamble8055@gmail.com*

**Abstract**

*Due to the different types of number plates being used, the requirements of an automatic license plate recognition system are different for each country. In this paper, a number plate localization and recognition system for Indian vehicles. This system is developed based on digital images and can be easily applied to car park systems for the use of documenting access of parking services, secure usage of parking houses and also to prevent car theft issues. Automatic license plate recognition system is to extract vehicle license plate from a video. The paper based on a combination and Image Processing filling up the holes approach method with area criteria test for the number plate localization. Segmentation of the plate characters was achieved by horizontal and vertical scanning method. The character recognition was accomplished with the aid of optical characters by the process of Template matching. We mainly concrete on three steps: one is to locate the number plate, second is to segment all the number and to identify each number separately, third is recognize each character.*

## I. INTRODUCTION

Automatic license plate recognition system plays important role in real life applications such as automatic toll collections, traffic law enforcement, parking lot access control, and road traffic monitoring. VLPR system recognizes a vehicle's plate number from an image by digital camera. It is fulfilled by the combination of a lot of techniques such as image acquisition i.e. capturing the image of real image of plate localizing the license plate character segmentation i.e. locating and identify individual character on the plate, optical character recognition.

The recognition problem is generally sub-divided into four parts are Image acquisition i.e. capturing the image of the license plate, Pre-processing the image i.e. localizing the license plate, Character segmentation i.e. locating and identifying the individual symbol image on the plate, Optical character recognition.

A guiding parameter in this regard is country-specific traffic norms and structure. This helps to fine tune the system i.e. number of characters in the license plate, text luminance level (relative index i.e. dark text on light background or light text on dark background) etc.

## II. LITERATURE SURVEY

Parul Shah, Sunil Karamchandani, Taskeen Nadkar, Nikita Gulechha, Kaushik Koli, Ketan Lad, "OCR-based Chassis-Number Recognition using Artificial Neural Networks"[1],As presented,



ISSN: 2233-7853 IJFGCN

The automatic detection and recognition of car number plates has become an important application of artificial vision systems. Since the license plates can be replaced, stolen or simply tampered with, they are not the ultimate answer for vehicle identification. The objective is to develop a system whereby vehicle identification number (VIN) or vehicle chassis number is digitally photographed, and then identified electronically by segmenting the characters from the embossed VIN. In this paper we present a novel algorithm for vehicle chassis number identification based on optical character recognition (OCR) using artificial neural network. The algorithm is tested on over thousand vehicle images of different ambient illumination. While capturing these images, the VIN was kept in-focus, while the angle of view and the distance from the vehicle varied according to the experimental setup. These images were subjected to pre-processing which comprises of some standard image processing algorithms. The resultant images were then fed to the proposed OCR system. The OCR system is a three-layer artificial neural network (ANN) with topology 504-600-10. The major achievement of this work is the rate of correct identificati on, which is 95.49% with zero false identification.

Weng Hong The, Duane S. Boning, Roy E. Welsch, “Anonymous Vehicle Detection for Secure Campuses: A Framework for License Plate Recognition using Deep Learning”[2],As presented, We report the development of multistrata subsurface IR (1.342 μm) nanosecond pulsed laser die singulation [stealth dicing (SD)] on high backside reflectance (up to 82%) Si wafers. We study the microstructural properties and formation mechanisms of the subsurface Si dislocation belt layer with respect to laser scanning speed, pulse laser energies, and interstrata distances. We optimize and exploit the multistrata interactions between generated thermal shock waves and the preceding dislocation belt layers formed to initiate frontal crack fractures that separate out the individual dies from within the interior of the wafer. A new partial-SD before grinding (p-SDBG) integration scheme based upon the tandem use of three-strata SD for controlled crack fracture toward the frontside of the wafer followed by static loading from backgrinding to complete full kerf separation is demonstrated. The optimized three-strata SD process and p-SDBG integration scheme can be used to compensate for the high backside reflectance wafers to produce defect-free eight die stacks of 25-μm-thick mechanically functional and 46-μm-thick electrically functional 2-D NAND memory dies.

Asmita Jondhale, Gautami Das, Samadhan Sonavane, “OCR and RFID Enabled Vehicle Identification and Parking Allocation System”[3],As presented, The available parking management systems require human efforts for recording entries of coming and leaving vehicles from parking in sheets. For huge parking it is difficult to keep track of the information. Use of Radio Frequency Identification known as RFID technology reduces human efforts and Optical Character Recognition known as OCR, enabled system will provide an automated system for parking management. And also it will provide the control over the access of parking space by the use of boom barriers. For huge parking it will be an effective system. Parking can be a commercial one or can be a Very Important Person (VIP) parking. Depending on the usage system can be used. Vehicle cannot be parked in parking if it is not registered. OCR acts as a solution for vehicles which are not registered. To keep track of the happenings in parking cameras are used. Places where automated systems are required, the proposed system is an answer. System combines the two strong technologies RFID and OCR.

Bhavin V Kakani, Divyang Gandhi, Sagar Jani, “Improved OCR based Automatic Vehicle Number Plate Recognition using Features Trained Neural Network”[4],As presented, Significant



ISSN: 2233-7853 IJFGCN

research and development of algorithms in intelligent transportation has grabbed more attention in recent years. An automated, fast, accurate and robust vehicle plate recognition system has become need for traffic control and law enforcement of traffic regulations; and the solution is ANPR. This paper is dedicated on an improved technique of OCR based license plate recognition using neural network trained dataset of object features. A blended algorithm for recognition of license plate is proposed and is compared with existing methods for improve accuracy. The whole system can be categorized under three major modules, namely License Plate Localization, Plate Character Segmentation, and Plate Character Recognition. The system is simulated on 300 national and international motor vehicle LP images and results obtained justifies the main requirement.

Pankaj Singh, Bhavya Patwa, Rohit Saluja, Ganesh Ramakrishnan, "StreetOCRCorrect: An Interactive Framework for OCR Corrections in Chaotic Indian Street Videos"[5],As presented, Obtaining a high-quality OCR output in smart cities, with human-in-the-loop, is an interesting problem for surveillance and other similar applications. Achieving high accuracy while reading license plates in the real world videos is cumbersome due to complexities like multiple vehicles, highdensity traffic in spatial and temporal domains, varying camera angles and illumination, occlusions and multiple resolutions. We present a modular framework for OCR corrections in the chaotic Indian traffic videos that especially involve complex license plate patterns. Such patterns are obtained from a state-of-the-art deep learning model trained on video frames. Since such a model reads the text from videos (instead of images), we incorporate multiframe consensus for generating suggestions in our framework. To ease the correction process, our human-interactive framework first breaks down the multi-vehicle videos into multiple clips, each containing a single vehicle from the video using an object detector and a tracker. Our framework then provides suggestions for an individual vehicle using multi-frame consensus. Our framework then selectively presents these extracted clips to the user to verify/correct the predictions with minimal human efforts via interactive suggestions. Such high-quality output can be used to continuously update a large database for surveillance and can be further used to improve the accuracy of deep models in the complex real-world scenarios.

## III. PROPOSED SYSTEM

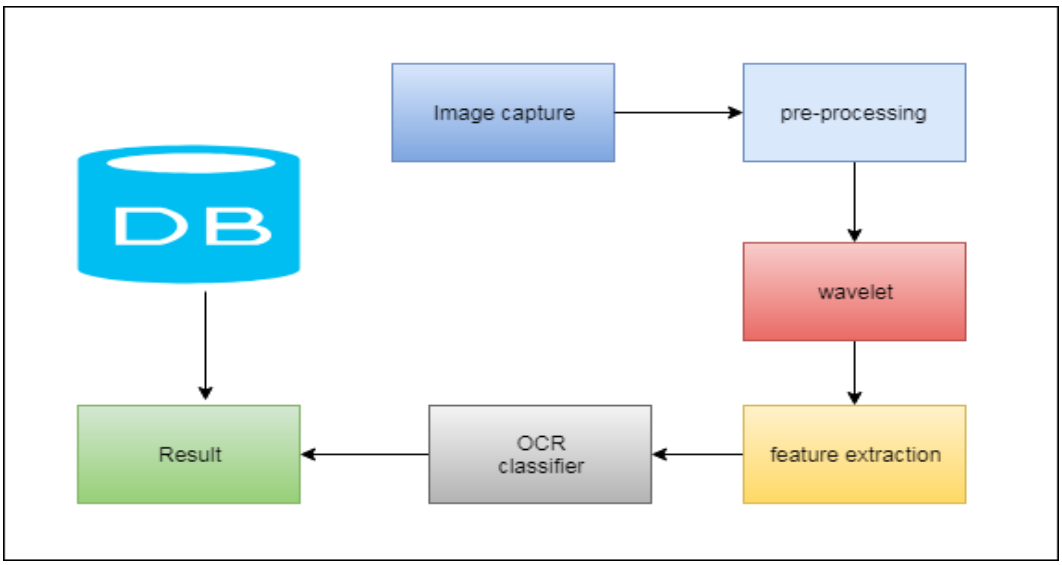



Fig. 1 Processing on Vehicle Image



ISSN: 2233-7853 IJFGCN

## IV. Methodology:

1. *Pre-processing of Image*: Pre-processing refers to the transformations applied to our data before feeding it to the algorithm. Data Pre-processing is a technique that is used to convert the raw data into a clean data set. Some of the point processing techniques include: contrast stretching, global thresholding, histogram equalization, log transformations and power law transformations. Some mask processing techniques include averaging filters, sharpening filters, local thresholding, etc.

2. *OCR Algorithm*: Optical character recognition (OCR) algorithms allow computers to analyze printed or handwritten documents automatically and prepare text data into editable formats for computers to efficiently process them. It is another way to extract and leverage business-critical data.

3. *Detection and Classification of Image*: In Machine Learning Decision Tree is one of the predictive modelling approaches used in statistics. Decision trees are constructed via an algorithmic approach that identifies ways to split a data set based on different conditions. Decision tree builds regression or classification models in the form of a tree structure. It breaks down a dataset into smaller and smaller subsets while at the same time an associated decision tree is incrementally developed. The final result is a tree with decision nodes and leaf nodes.

Any suspected image of leaf is provided as input to proposed system. Further pre-processing on that image carried out in the following manner:
*1. RGB to Grayscale conversion of image*: A grayscale image is one in which the value of each pixel is a single sample representing only an amount of light, that is, it carries only intensity information. Grayscale images, a kind of black-and-white or gray monochrome, are composed exclusively of shades of gray. The contrast ranges from black at the weakest intensity to white at the strongest.

*2. Edge Detection*: The Canny edge detector is an edge detection operator that uses a multi-stage algorithm to detect a wide range of edges in images. It was developed by John F. Canny in 1986.

*3. Thresholding*: Image thresholding is a simple, yet effective, way of partitioning an image into a foreground and background. Thresholding is used to create a binary image from a grayscale image.

*4. Noise Reduction*: Noise removal algorithm is the process of removing or reducing the noise from the image. The noise removal algorithms reduce or remove the visibility of noise by smoothing the entire image leaving areas near contrast boundaries. Types of noises are salt and pepper , Gaussian noise, Shot noise, etc.
take and repurpose data from camera images or image-only PDFs, you need OCR software that will take the letters from those images to create words, then sentences, to access and edit the original content on the page. This is done through looking at each line of the image, with the OCR scanner figuring out if the black and white dots represent a certain letter or number.

There are several OCR tools available to convert image-based documents to PDFs, .docx, or other



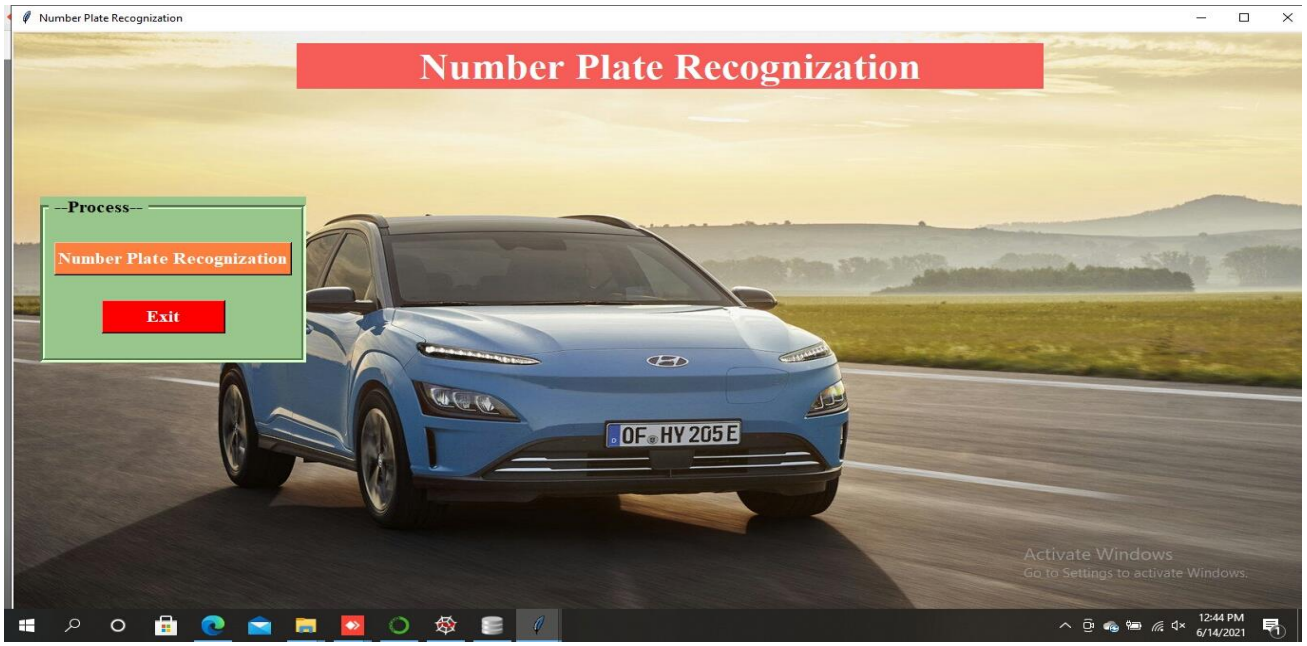
ISSN: 2233-7853 IJFGCN

formats. The main features that differentiate OCR application tools, according to TechStic, include character recognition accuracy, page layout reconstruction accuracy, multi-engine voting technology, support for languages, support for searchable PDF output, speed, and user interface (UI).

## V. CONCLUSION

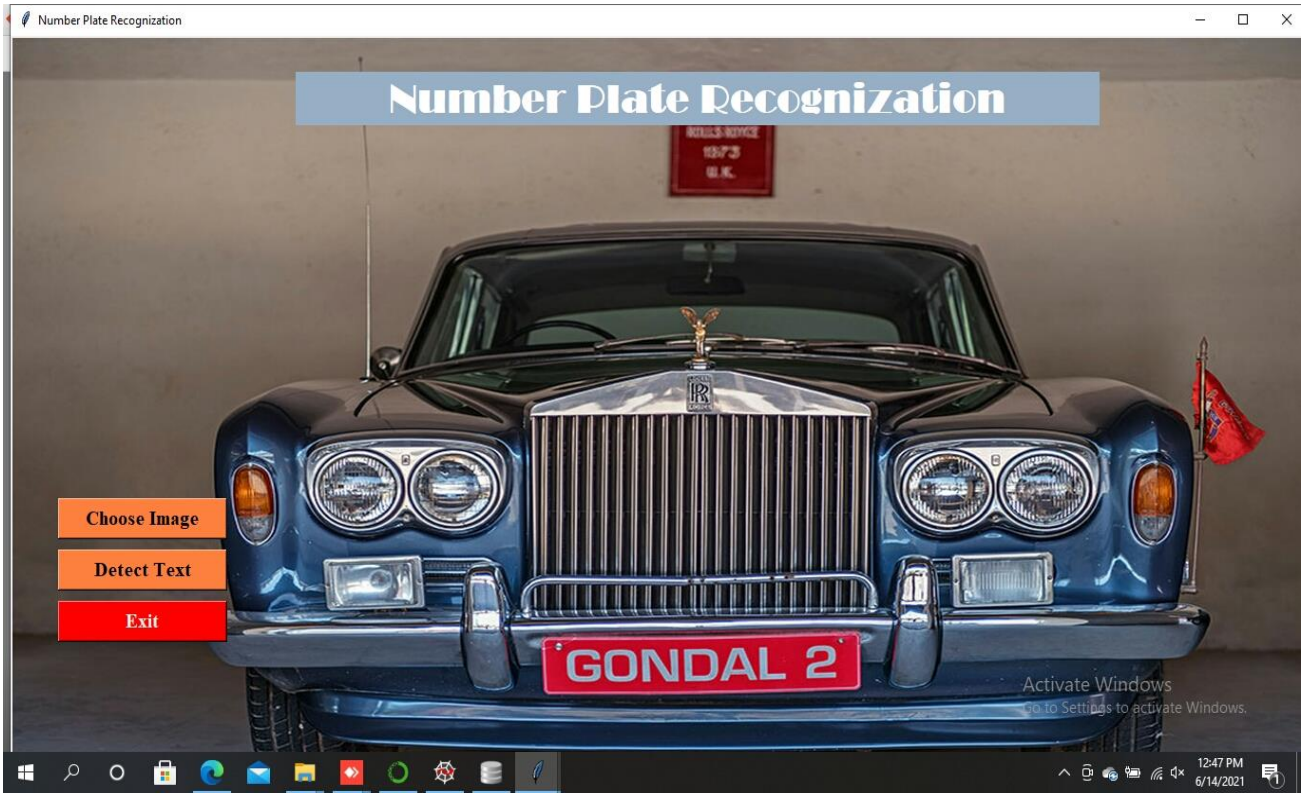
The car number plate recognition software, comprising of the license plate extraction, character segmentation and optical character recognition modules was designed and implemented. A suitable database with hypothetical user data was also incorporated to complement the system. The ANPR achieved an overall success rate of 68% when tested on 100 of the 108 images, with recognition performances for simple visible plates close to 80%.Results may be improved by refining the recognition stage and testing other classifiers. Different character templates could be used for such refinement of the recognition stage.

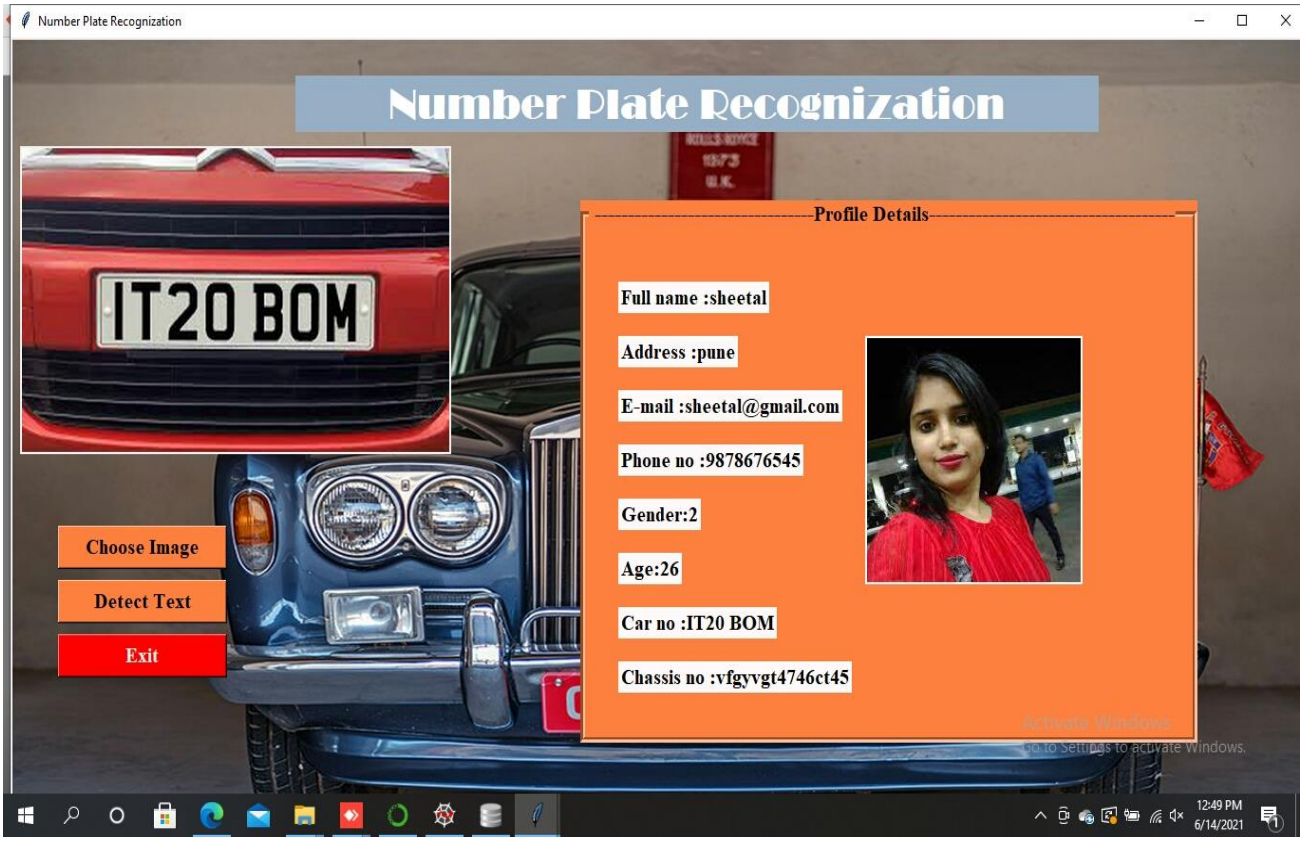
## VI. RESULT




ISSN: 2233-7853 IJFGCN






ISSN: 2233-7853 IJFGCN


REFERENCES

1. DebkumarChowdhurySouraneelMandal Dona Das Soumya Banerjee SourathShomeDevlinaChoudhary*Computer Science & Engineering University of Engineering & Management, Kolkata* Kolkata, India An Adaptive Technique for Computer Vision Based Vehicles License Plate Detection System 978-1-7281-0070-8/19/$31.00 ©2019 IEEE
2. Naaman Omar YaseenSalimGanimSaeed Al-Ali AbdulkadirSengur*Department of Information Technology Duhok Polytechnic University* Duhok, Iraq Development of New Anpr Dataset for Automatic Number Plate Detection and Recognition in North of Iraq 978-1-7281-3992-0/19/$31.00 ©2019 IEEE
3. Khin Pa PaAung, KhinHtarNwe, Atsuo Yoshitaka Automatic License Plate Detection System for Myanmar Vehicle License Plates 2019 IEEE.
4. Wang Dong, Zhou Yang , Wu Ling, Zhang Yonghui , Li Ting, QiaoXiaoliang Research on vehicle detection algorithm based on convolutional neural network and combining color and depth images 978-1-7281-3066-8/19/$31.00 ©2019 IEEE
5. Sizhe Huang, HuoshengXu, Xuezhi Xia, Yi Zhang End-To-End Vessel Plate Number Detection and Recognition Using Deep Convolutional Neural Networks and LSTMs 2473-3547/18/$31.00 ©2018 IEEE
6. PonNithis Kumar V S, Mithun R, ShravanSankar, Ashwin C, M.E.Harikumar*Image Processing based Number Plate Detection Using LabVIEW*978-1-7281-5821-1/20/$31.00 ©2020 IEEE
7. Gizem MUSLU Bülent BOLAT Nighttime Vehicle Tail Light Detection with Rule Based Image Processing 978-1-7281-1013-4/19/$31.00 ©2019 IEEE



ISSN: 2233-7853 IJFGCN