IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 6, April 2023

Vehicle Number Plate Detection

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Abstract: *This study introduces an enhanced version of a previously published genetic algorithm based technique to allow fast and accurate detection of the vehicle plate number independently of the used application. 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.*

Keywords: OCR

I. INTRODUCTION

VEHICLE plate detection and recognition appear in vast variety of applications, including travel time estimation, car counting on highways, traffic violations detection, and surveillance applications [1]–[3]. Traffic monitoring cameras are mounted four to seven meters above the street level. Plate recognition range, where the cameras are able to capture the vehicles plates with sufficient resolution, starts from 20 to more than 50 meters away from the camera location. This range depends on the camera resolution and the lens mounted on the camera Optical character recognition (OCR) which plays chief role in automatic number plate recognition is among the main aspect of research in artificial intelligence and computer vision and have evolved greatly since its inception.

This paper presents a feed-forward Artificial Neural

Network (ANN) based OCR algorithm that is specially designed to meet the requirement of an ANPR system. The system is then implemented and tested on MATLAB.

The paper is organized as follows: After Introduction, Related work is produced in section

II. RELATED WORKS

A. Licence Plate Localization Techniques

Efficient licence plate localization is a difficult task as vehicle used under various conditions makes plate dirty, moreover different weather conditions and light condition challenges the efficiency of LP localization. The algorithm proposed in [3] fight against this challenges where localization using sobel edge detection technique is proposed. The drawback of previous algorithm is that unwanted areas are also displayed in intensity images thus making detection difficult. This ideally occurs in images having complex background where intensity variations of background dominate the number plate region

B. OCR Methodologies

8] Provides novel OCR technique which authors claims 100 accuracy for digital fonts. It involves partial segmentation of character using features and correlating segment set with the ASCII characters. OCR based on matrix matching is proposed in [9]. OCR using non determined solution using fuzzy set and fuzzy equations is presented in [10]. OCR is proposed for low resolution character image or low quality images using structural analysis in [11].

III. PREPROCESSING AND LOCALIZATION

For efficient output the image is altered intensely in this stage. Color image is converted to HSV color space which is two dimensional in nature. The advantage of HSV color model is we can neglect the effect of shadow in an image as

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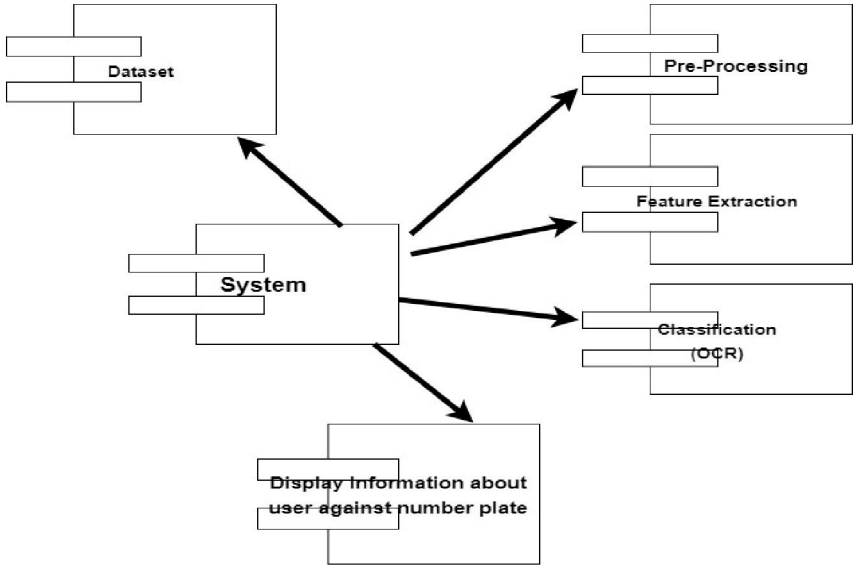
shown in fig, 1. The Saturation value is extracted that gives us the image by neglecting the shadows. It is then transformed to binary image using edge detection technique for better processing.

IV. OPTICAL CHARACTER RECOGNITION

Character recognition using feature extraction This algorithm uses the fact that every character have unique set of features such as corners, ending and bifurcations. Inheriting this features makes the algorithm fast and less complicated. The input character is converted to edge image and the features are extracted from it in iterative process. These features are then stored in the feature vector with the number, direction and state of the features

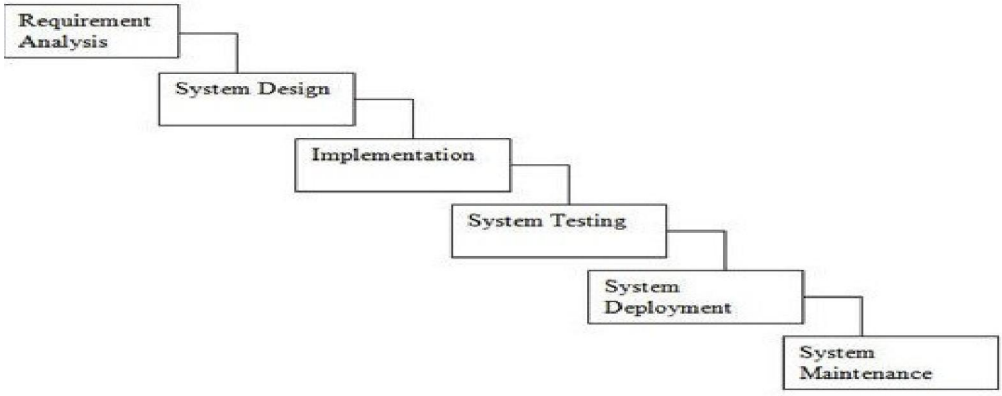
4.1 Deployment Diagram



4.2 SCLC Model

SDLC Models stands for Software Development Life Cycle Models. In this article, we explore the most widely used SDLC methodologies such as Agile ... Each software development life cycle model starts with the analysis, in which the Also, here are defined the technologies used in the project, team load.

One of the basic notions of the software development process is SDLC models which stands for Software Development Life Cycle models. SDLC – is a continuous process, which starts from the moment, when it's made a decision to launch the project, and it ends at the moment of its full remove from the exploitation. There is no one single SDLC model. They are divided into main groups, each with its features and weaknesses.



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V. CONCLUSION

This project presents a novel and efficient approach to vehicle detection .The proposed approach consists of three components: image pre-processing, character extraction and number plate verification. These systems have been tested day and night over a year and presented robust and reliable performances, in different weather conditions, such as rainy, snowy, and dusty. The character recognition part of our system has been tested separately over the mnistdata set and achieved 98.5% accuracy, with comparably low computational requirement. The presented techniques, algorithms and parameter setting procedures, along with our data sets and related evaluations, provide a complete set of solutions to issues.

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