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A SINGLE NEURAL NETWORK FOR MIXED STYLE LICENSE PLATE DETECTION

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ABSTRACT

The goal is to create and put into use a reliable vehicle identification system that uses the licence plate to identify the vehicle. The created system takes a picture of the front of the car, finds the licence plate, and then reads the plate. Using image processing, the automobile licence plate is retrieved from the image. Character recognition is accomplished via optical character recognition (OCR). The system is created with OpenCV, and numerous images are used to test how well it performs. It has been noted that the system built detects and recognises the car licence plate successfully.Utilising the Python programming language, to recognise licence plate numbers. For this project, OpenCV will be used to recognise the licence plate numbers. and To extract the characters and numbers from the plate, Python Pytesseract will be used We'll create a Python application that can read licence plates automatically. the creation of an optical character recognition (OCR)-based intelligent vehicle identification system for use with intelligent transportation systems. The SPANS system uses computer vision algorithms to determine whether or not the parking spaces are open. The suggested system uses the SPANS captures images of parking spaces and recognises licence plate numbers of cars passing through the lot as well as those parked there.

Keywords: OpenCV, pytesseract OCR, licence plate recognition, photos of vehicle licence plates

1.Introduction

To offer a method for detecting licence plates on vehicles used to control entry and keep an eye on vehicles using the entrance ramp to enter the parking lot. A camera on the entry ramp is keeping an eye on the vehicles. The ability to access can be granted after video processing. The answer's aim is to identify the licence plate number and locate the licence plate area in this video file.[1] Because of the increased number of cameras in cities—the majority, if not all, of which are online—automatic License Plate Recognition has become a popular study topic. The video traffic generated by the cameras can be examined to obtain useful information for the transportation sector. This article describes the creation of an optical character recognition (OCR)-based intelligent vehicle identification system for use with intelligent transportation systems. The suggested method takes use of the Smart Parking Service (SPANS), an intelligent parking system for managing both public and private spots. The SPANS system uses computer vision algorithms to determine whether or not the parking spaces are open. The suggested system utilises SPANS.[2] We suggested a novel and efficient method for learning a RICNN model by optimising a new objective function that requires training samples before and after rotation to share similar features in order to achieve rotation invariance. The conventional

CNN model is adapted for object detection in optical remote sensing images in this technique. The proposed approach outperforms state-of-the-art methods, as evidenced by quantitative comparison results on a publicly available ten-class VHR object detection data set..[3]The LPR technique has been successfully applied in numerous fields. The OCR serves as the LPR system's brain. An OCR system based on hardware has been implemented in this study. The right configuration and selection of the network size, as well as the efficient and effective setup of the neuron activation function, are to blame for the higher recognition accuracy. An incomplete data set of Ontario licence plates was used to train and test the network, and it was able to correctly identify the images 98.2% of the time.[4]The segmentation of VLP characters will be dealt with using a novel strategy. LSM is used to make the fragmented portions of Chinese characters into a linked region in order to rectify the tilt in the tilted VLP images. Following the fusion of two source photos, PM character segmentation is utilised to create the final character images. A machine can recognise and interpret text characters thanks to Tesseract, an optical character recognition (OCR) library. The library is compatible with the operating systems Windows, Linux, and MAC OS, and it supports numerous programming languages, including Python. It is possible to read text characters from more than 100 different languages, and the output of the recognition can be stored as a txt, pdf, hocr, or tsv file. Object detection from input images is an image processing step in which appropriate strategies for enhancing the quality of the image and the object features are used.Algorithms and mathematical principles that guarantee accurate character segmentation, normalisation, and recognition processes for number plate detection. Comparatively, work focuses on techniques for making systems invariant to image skew, translations, and varied lighting conditions during capture .

Objective:

The Tesseract library was used to implement the recognition of licence plate numbers. A machine can recognise and interpret text characters thanks to Tesseract, an optical character recognition (OCR) library. The library is compatible with the operating systems Windows, Linux, and MAC OS, and it supports numerous programming languages, including Python. It is possible to read text characters from more than 100 different languages, and the output of the recognition can be stored as a txt, pdf, hocr, or tsv file. Object detection from input images is an image processing step in which appropriate strategies for enhancing the quality of the image and the object features are used.

2.LITERATURE SURVEY

1.“NDalarmelina. do V., Teixeira, M. A., & Meneguette, R. I “ Meneguette It was suggested that the system store the identification number so that public organisations like traffic departments may access it.

2.’’Cheng, G., Zhou, P., & Han, J.’’ claimed that when compared to state-of-the-art methods, the VHR object detection data set has significantly improved performance.

3.“Yuan Jing, Youssefi, B., Mirhassani, M., & Muscedere, R.” proposed that 98.2% of the time, the network could effectively recognise the photos after being trained and tested on a sparse amount of data containing Ontario licence plates

4.“Pan, M.-S., Yan, J.-B., & Xiao, Z.-H.” . Proposed This approach successfully gets around earlier challenges. Yet we must note that this approach is not well suited to photos where there.

3.PROBLEM STATEMENT

To prevent the image of the number plate from being detected, identify the licence plate in the image and use opencv to extract the characters from the detected licence plate. This model focuses an existing technique for recognising a vehicle's licence plate that is created utilising the OpenCV technology. fewer features are compatible, Poor precision

4.PROPOSED SYSTEM

In the intended method, we use OpenCV with the pytesseract OCR method to implement to train the image to several formats. In the grey image format, we crop the image in only the number plate to take

into account the show the text format. We construct a website as the backend. Correct categorization, reduced complexity, high performance, and simple identification.

5.ARCHITECTURE

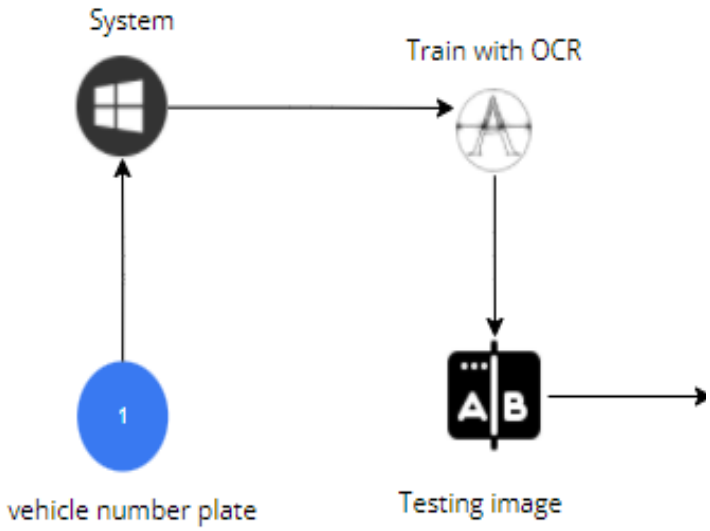

Fig 1-System Architecture

This phase entails reviewing the first phase's specifications and developing the system architecture. This system design assists in determining hardware and system requirements, as well as general system architecture.Create
Dataset,Preprocessing,Train,Classification.

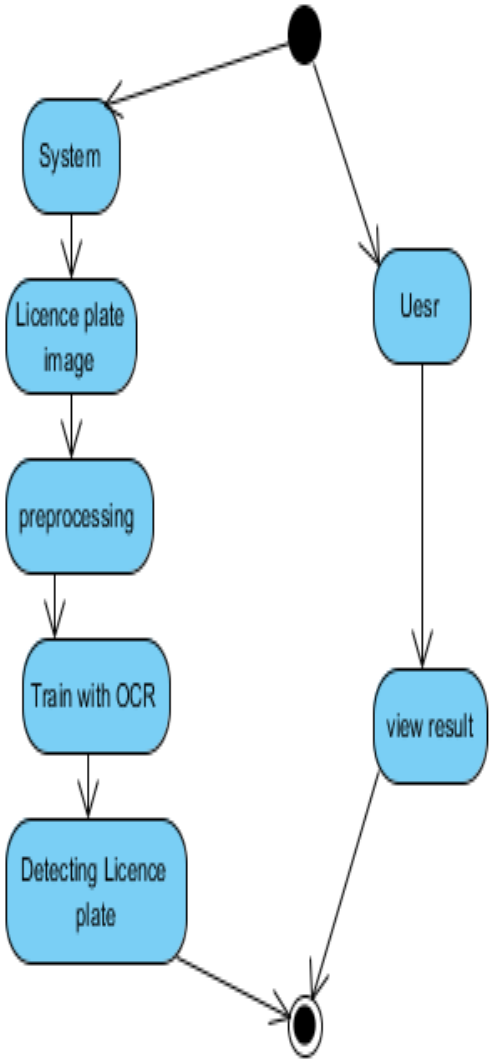

Fig 2-Activity Diagram

Activity diagrams are visual representations of workflows that enable choice, iteration, and concurrency through activities and actions. In the Unified Modeling Language, activity diagrams can be used to represent the operational and business workflows of system components. An activity diagram depicts the overall control movement.

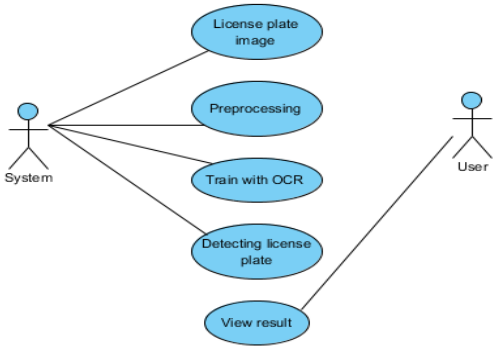

Fig 3-Usecase Diagram

The primary goal of a use case diagram is to identify which system tasks are performed for which actor. The roles of the system's actors can be used to depict them.The UML is an essential part of the software development process and the production of object-oriented software. To convey software project design, the UML mainly uses graphical notations.The user can observe the outcome.

IMPLEMENTATION

• With input from The system design, the system is originally built in discrete programmes known as units, which are then combined. Unit testing is the process of making and evaluating the functionality of each unit.

• To begin with, we've gathered images of licence plates.

• Setting up images in different formats.

. Prior to detecting the licence plate, we train the OCR algorithm over all of the image

ALGORITHMS

Computer vision

A computer is a technique that allows us to understand how images and videos are stored, how they can be changed, and how data can be extracted from them. Computer vision is the foundation or main tool used in artificial intelligence. Computer vision is used extensively in self-driving cars, robotics, and photo-editing apps.

OpenCV

OpenCV is a big open-source library for image analysis, machine learning, and computer vision. It now plays a critical role in real-time operations, which are essential in contemporary systems. It can recognise items, faces, and even human handwriting in pictures and videos. Python can handle the OpenCV array structure for analysis when combined with other libraries such as NumPy. We use vector space and mathematical operations on these features to identify visual patterns and their various features.OpenCV 1.0 was the first version released. OpenCV is free for both research and commercial use because it is distributed under the BSD licence. It supports C++, C, Python, and Java APIs.

Image-Processing

Image processing is the process of performing different operations to a photograph in order to improve it or extract useful information from it. The basic definition of "image processing" refers to the analysis and modification of a digital image, especially to improve its quality.

Digital-Image:An image can be thought of as a two-dimensional function, f(x, y), with x and y being spatial (plane) coordinates and the intensity or grey level of the picture at any given location being the function's amplitude at any given combination of coordinates. (x, y). In other words, an image is merely a two-dimensional matrix (or, in the case of coloured images, a three-dimensional matrix) that is described by the digital image.

6.RESULTS

User Login Page:

The user login page

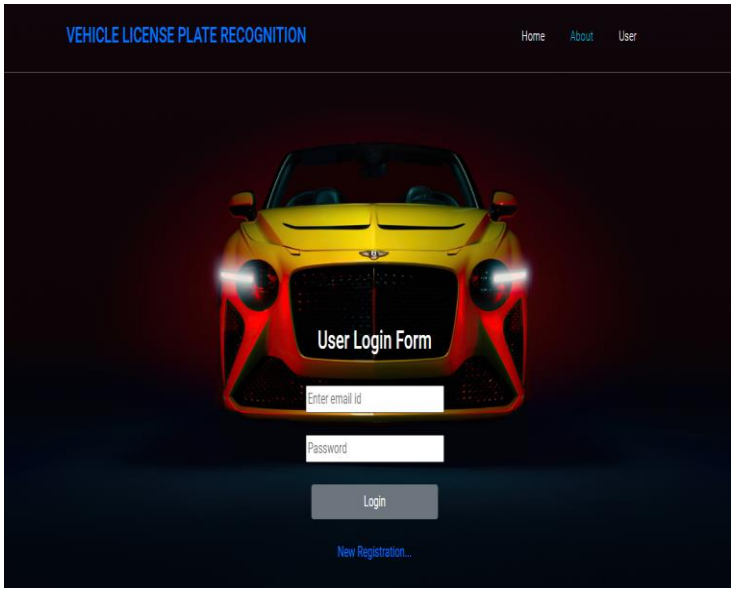

Fig no:1

New Registration:

For the registration of new users.

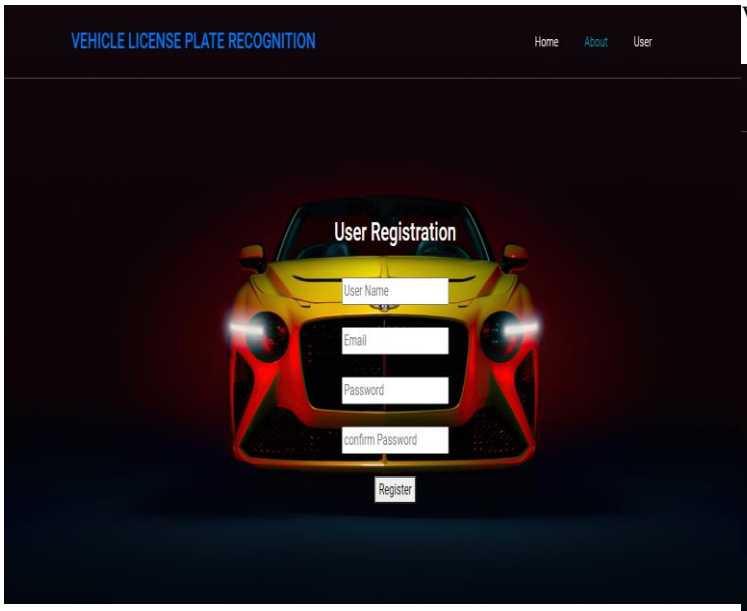

Fig no:2

User home Page:

The new user home page

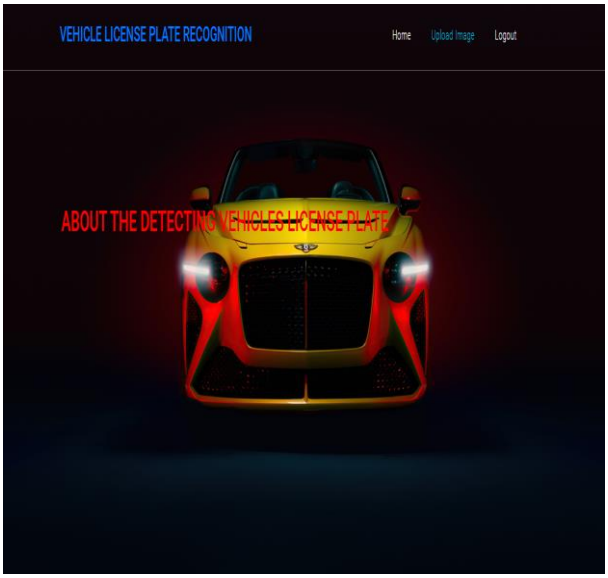

Fig no:3

Upload Image:

we can upload any vehicle image from the dataset

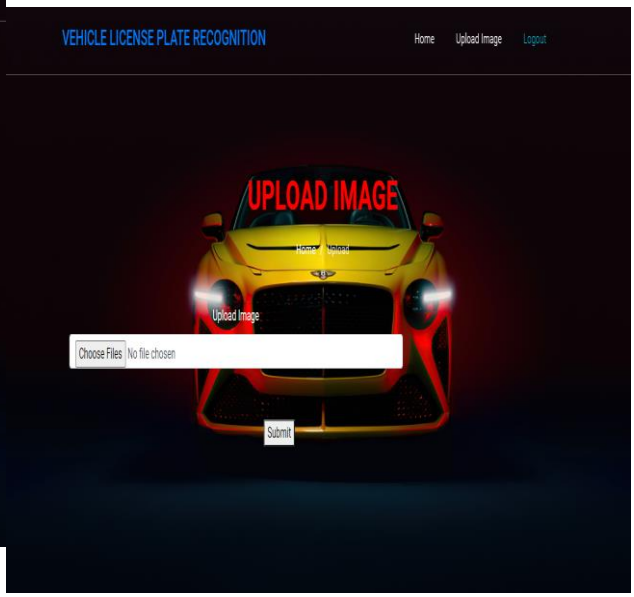

Fig no:4

Result Image:

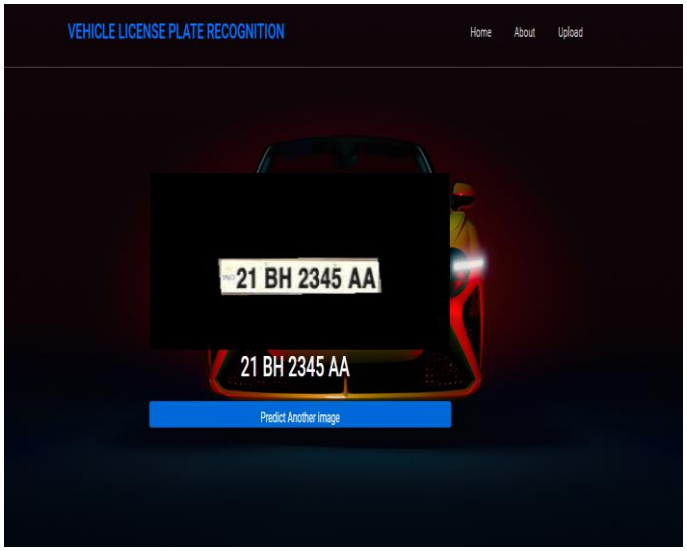

Fig no:5

VII CONCLUSION

We successfully detected a vehicle licence plate in a car image using OpenCV and Tesseract Ocr in this project. In this case, we can create a login page for users so that they can detect any image of a vehicle in the dataset and determine the number. We created a front end and a backend for this.

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