Parking Allotment Using ML

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Abstract **– In recent years, parking has become an important concern in densely populated places. It causes lot of traffic on road which leads to noise pollution, road rage. Also it wastes the time if the parking is not available in that area. Our application is to provide the parking lot and tell how many parkings are available. Through number plate detection, it uses deep learning technology to read the license plate and display the vehicle owner's information. The project aids in displaying the parking spaces that are available on campus before designating a specific parking space.**

Keywords — Open cv, pytesseract, easy OCR, Android Studio, Webcam

I.INTRODUCTION

Vehicles have always been an essential part of civilization. They have revolutionized the way we commute, offering convenience and mobility to people around the world. The rising affluence of urbanization in India has made vehicle ownership a necessity for many. However, with this increase in vehicle ownership, a pressing issue has emerged: finding an available parking spot in today's cities.

In present-day cities, the challenge of securing a parking spot has become increasingly daunting for drivers. This problem is exacerbated by the ever-growing number of private car users, a trend that shows no sign of slowing down [5]. Now, in urban areas where the demand for parking spaces far outweighs their availability [2], overcrowding in parking areas has become a common sight.

Recent surveys have shed light on the severity of the issue, revealing that more than 30% of traffic congestion can be attributed to the search for vacant parking spaces [1]. The essential need for a more sophisticated and efficient parking system is shown by this statistic. Innovative solutions that can notify drivers in advance about the availability of parking spots at and near their intended destinations are needed to address issues linked to parking and traffic congestion. [5].

This is where the Automatic Number Plate Recognition (ANPR) system comes into play, offering a promising solution to these pressing urban challenges. The ANPR system plays a pivotal role in addressing parking and traffic congestion issues by providing users with real-time information about parking space availability [5].
The evolution of parking systems from manual implementations in older systems to fully automated and computerized systems [2] demonstrates the potential for technology to revolutionize the way we manage parking. In this paper, we delve into the exciting realm of parking allotment using Machine Learning (ML), exploring how ML algorithms can optimize the allocation of parking spaces, reduce traffic congestion, and enhance the overall urban commuting experience.

II.METHODOLOGY/EXPERIMENTAL

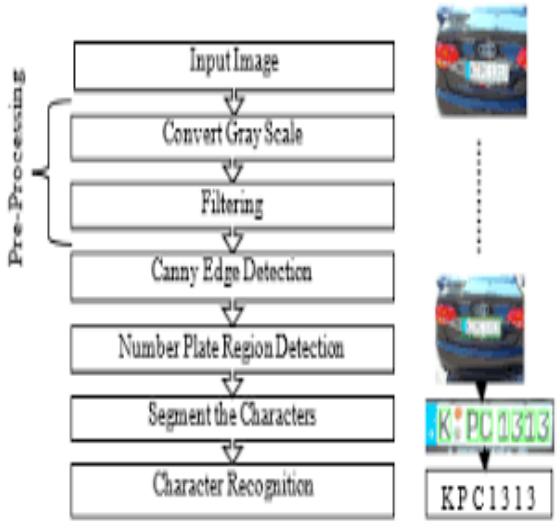
Number Plate Detection: The first step is to detect the no. plate from the vehicle. A camera takes a picture of the car, which is then supplied to the processing unit. OpenCV is used to detect the rectangular objects.

Character Segmentation: Once the Number plate is detected, it is cropped out and saved as a new image.
Character Recognition:

Optical Character Recognition (OCR) is used to detect the number and characters in the number plate.

Data Acquisition and Transmission:

The Vehicle no. is used to collect the details of the detected vehicle. The details are collected from the database using SQL.



Upon the successful detection of a vehicle's license plate, our system seamlessly proceeds to allocate a parking spot through an Android application specially designed to enhance user experience. The application offers a comprehensive set of features, including user login and new user registration functionality, which ensures that both registered and first-time users can access the service effortlessly. By leveraging our meticulously designed application, our system swiftly identifies an available parking spot tailored to the specific vehicle's dimensions and then guides the user through a secure and user-friendly payment process. Subsequently, the system efficiently allocates the selected parking spot, ensuring a smooth and hassle-free experience for users in their quest for parking convenience.

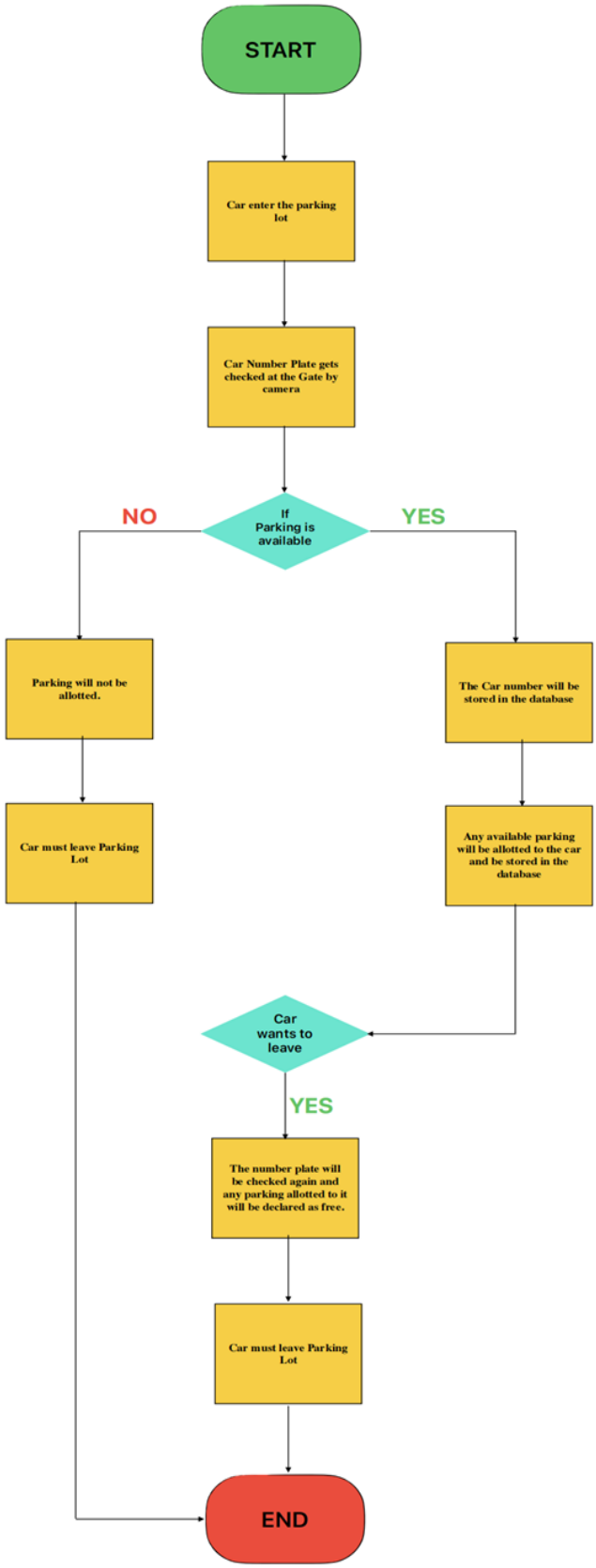


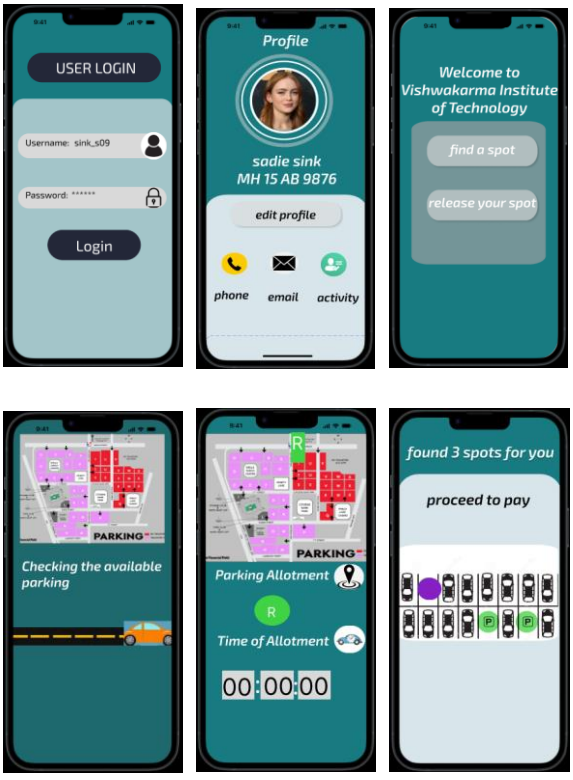
Fig.1 Flowchart

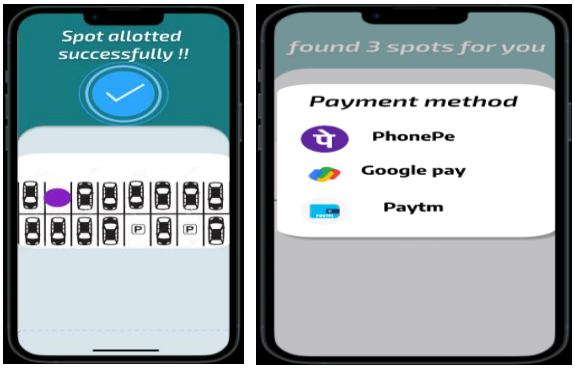
This is the flowchart of how our application would work. When the car will enter so at the gate the number plate will be checked by the camera , then if the parking is available then the number will be stored in database and the parking will be allotted. If the parking is not available then the person will be informed immediately. When the car wants to leave the number will be again checked and the parking allotted will be declared free. The UI design is created in figma app which helps to design application in easier way.

III.RESULTS AND DISCUSSIONS

The need for intelligent parking systems is rising dramatically. [4]. The system designed was able to detect the number plate on a vehicle. The system was successfully scanning and recognizing the alphabets from the detected number plate. After checking with previous entries system checked whether any parking spot can be allotted or not. This enables the user to access parking space availability in real time.[4].

UI desgin for the allotment application:





According to the results parking spot is allotted. The system developed made the parking system much easier, efficient and organized. The system has high potential with wide scope hence can be used in relatively bigger organization.

IV. CONCLUSION

- In conclusion, the development of the crowd control management has shown positive results.
- The system provides monitoring of details of vehicle, available parking.
- This avoids unwanted parked cars on roads which causes heavy traffic.
- It has a systematic set up as the time of allotment of parking and the time of departure is also noted, so that we know that there are how many parking available. As a result, the user's waiting time while looking for a parking spot is reduced.[4].
- The project offers a new solution to the evolving technology such as: saving time and manual effort, problem of illegal parking, reduction of traffic jam and more safety parking high[1].
- The parking space information and process are provided in real time by the system.[4].
- Regarding the upcoming construction, users will be able to reserve a parking spot from a distance.[4].
- The purpose of this article is to improve a city's parking facilities, with the ultimate goal of improving the people's quality of life. [5].

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