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Virtual Valet

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Abstract: ***Virtual Valet is an image processing technology which is used to retrieve the registered number of vehicles from its number plate to identify the vehicle. The main objective is to design an efficient vehicle identification system with the help of its number plate. This system will help in reducing crime, it will help in improving road safety, deterring terrorism. It can be implemented in automatic parking systems, border control. It is useful to detect the stolen cars. This app is also useful in traffic management. It can be used by various police forces and by electronic toll collection.***
Firstly, the system will ask for the vehicle's image. After that the region of interest that is number plate is extracted using image segmentation in an image. For character recognition we have used the optical character recognition technique. Optical character recognition is the last step in vehicle number plate detection. After this the resulting data will be used to compare with the database so that we can get specific information like the owner's name, registration number, address etc.
Keywords: (OCR)Optical Character Recognition, Pytesseract, OpenCV, Django

I. INTRODUCTION

This is a prototype for digital image processing. Image capture, pre-processing, number plate segmentation, and then OCR are the procedures employed (Optical Character Recognition). Using the OCR approach, the plate number shows on the terminal as text. Parking is an issue that many cities face. The technology can photograph automobiles in parking lots and save their licence plates in a database (or the cloud, if connected to the internet). This technology removes the need for unnecessary and unpleasant physical work, reduces labour expenses, and outperforms people on a regular basis.
The number of any car can be shown, saved in the database, or searched for details throughout the database once it has been received as text.
Although video surveillance systems are used for security monitoring, detecting moving objects is a difficult task. In situations where a certain car is assigned a parking space, the incorrectly parked vehicle can be identified. It should be noted that car number plates come in a variety of shapes, sizes and colour. Theft recovery, car parking management, and vehicle identification in traffic all benefit from number plate recognition.
Most number plate localization methods involve many steps, resulting in a lengthy computation (and hence execution) time (which can be shortened by using fewer, simpler algorithms). In the event of sophisticated, noisy photos with a lot of information, the approaches' reliability is severely hurt. The output is heavily influenced by image quality. Regrettably, the different techniques only give a partial solution to this issue; the only way to cure it is by careful camera adjustments. This implies that the automobile must be photographed with as little background as possible, and the number plate captured must be as large as feasible.

II. LITERATURE SURVEY

Many developments in Digital Image Processing have been utilized in various fields with advances in Optical Character Recognition Technology as well. In recent years, a number of ways for using digital image processing have been created. OCR became offered as a service (WebOCR) in the 2000s, as well as in cloud computing and mobile apps such as real-time translation of foreign-language signs on a smartphone. Vehicles are now treated as conceptual resources in information systems as a result of the huge integration of information technologies across several elements of the modern world. Because an autonomous information system is useless without data, it is necessary to reorganize vehicle data between reality and the information system. Human agents or special intelligent equipment can accomplish this, allowing automobiles to be identified by their registration plates in real-world settings.
Intelligent equipment includes systems for detecting and recognising vehicle licence plates. The system of vehicle number plate detection and recognition is used to identify plates and subsequently recognise them, which entails extracting text from an image. This is because calculating modules employ plate segmentation, location algorithms, and character recognition. License plate recognition and reading is a sophisticated technology with multiple applications.

A. Background

This project is a prototype based on Digital Image Processing. Image acquisition, pre-processing operation, number plate segmentation, and then OCR (Optical Character Recognition) are all used. Using the OCR principle, the plate number appears as text on the terminal. Parking is a problem that many communities encounter. The system can be used in parking lots to capture pictures of cars and log their license plates in a database (or the cloud, if connected to the internet). On every busy day, this technology reduces the need for unnecessary unpleasant manual labour, saves labour costs, and is far more efficient than humans. The number of any car can be shown, saved in the database, or searched for details throughout the database once it has been received as text. Although video surveillance systems are used for security monitoring, detecting moving objects is a difficult task. In situations where a certain car is assigned a parking space, the incorrectly parked vehicle can be identified. It should be noted that car number plates come in a variety of shapes, sizes and colour. Theft recovery, car parking management, and vehicle identification in traffic all benefit from number plate recognition.

B. Aim and Objectives

The main purpose of this project is to create an app that leverages Python's EasyOCR and Tesseract to allow users' devices to automatically record license plates of cars, allowing them to learn more about the vehicle. Django will be used to integrate the backend with the frontend.

III.PROPOSED METHODOLOGY

A. Block Diagram

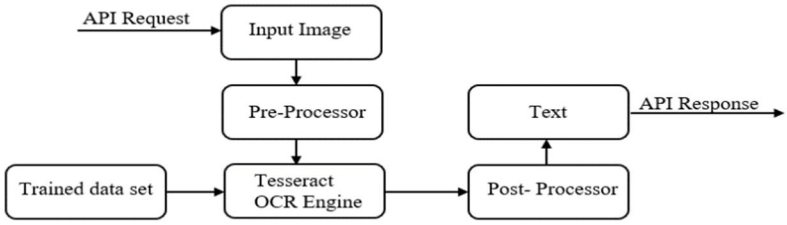

Fig 1 Block diagram

B. Flowchart

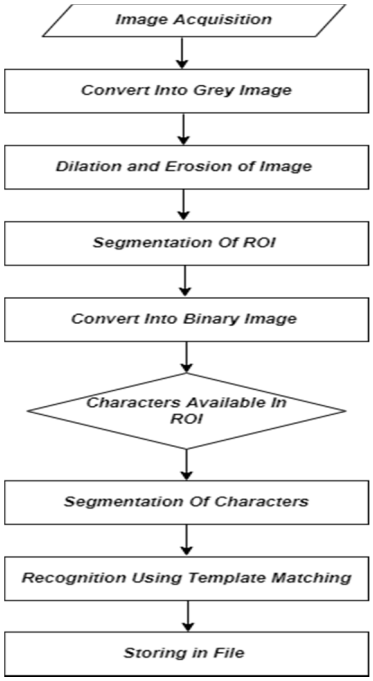

Fig 2 Flowchart

C. Implementation

1) First, the user will be able to view the home page where they can see the options to either create a new account or log in.

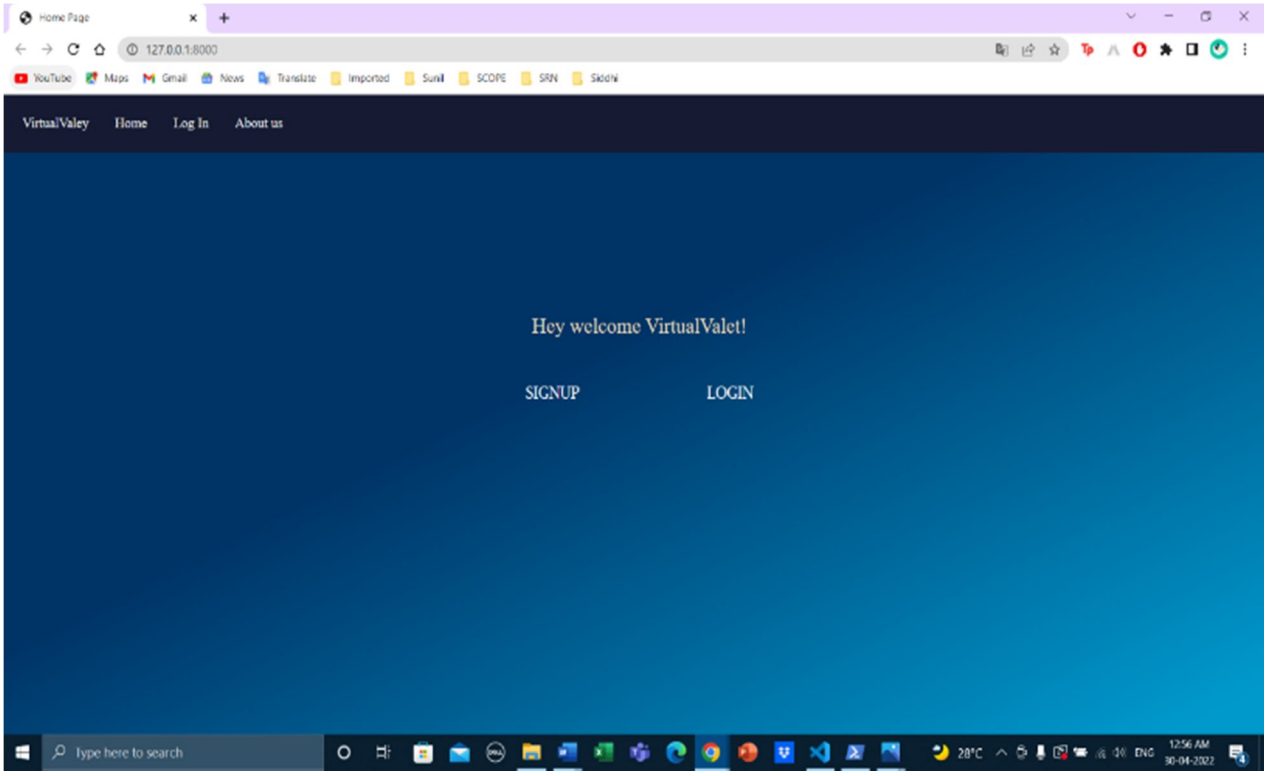

Fig 3 Homepage

2) All the new user users must create an account and register by providing some details.

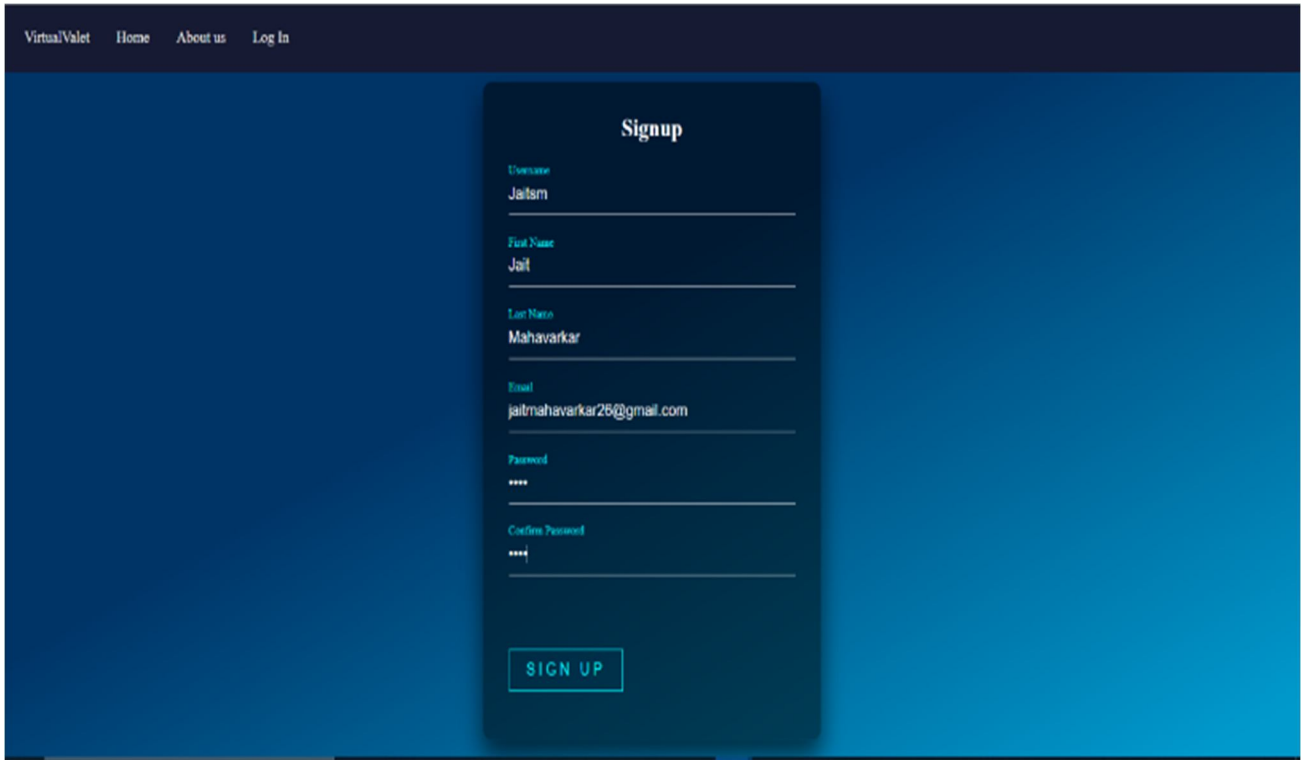

Fig 4 Sign up Page

3) Once the users have successfully registered, they are re-directed to the login page where the can log into the system by just providing the username and password.

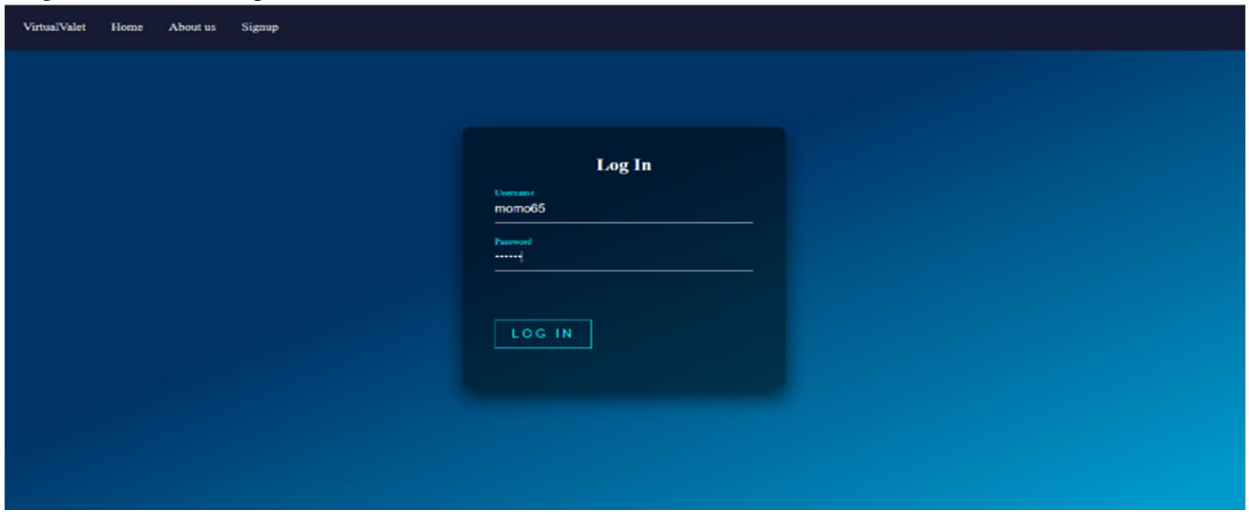

Fig 5 Log in Page

4) Then, when the user logs in, they will get an option to click the image or upload the image

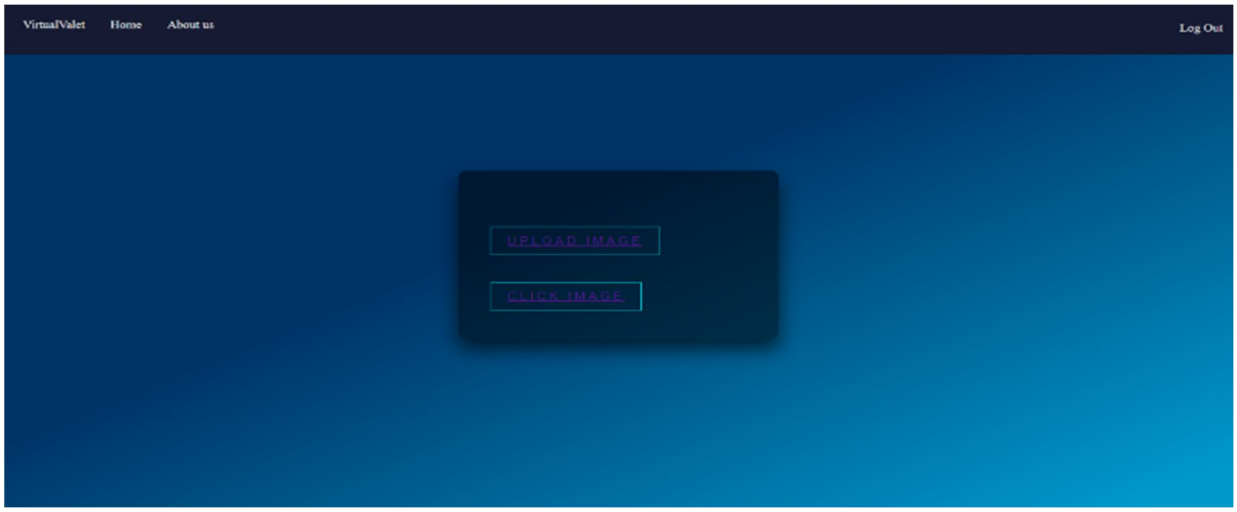

Fig 6 Upload or click image

5) Once the user chooses to upload the image the system will ask for the car image.

6) Pytesseract output

Fig 7 Pytesseract output

7) Once the car's number plate is verified the information of the car owner will be displayed

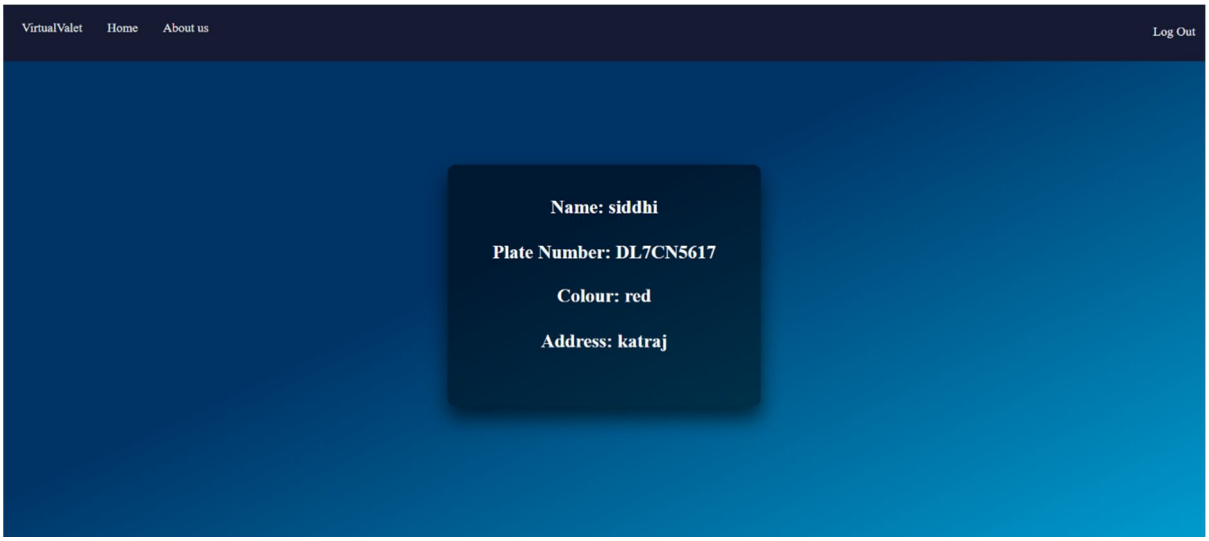

Fig 8 Information page

8) If the user chooses to click the image, then the system will start the camera and then upload the image after clicking

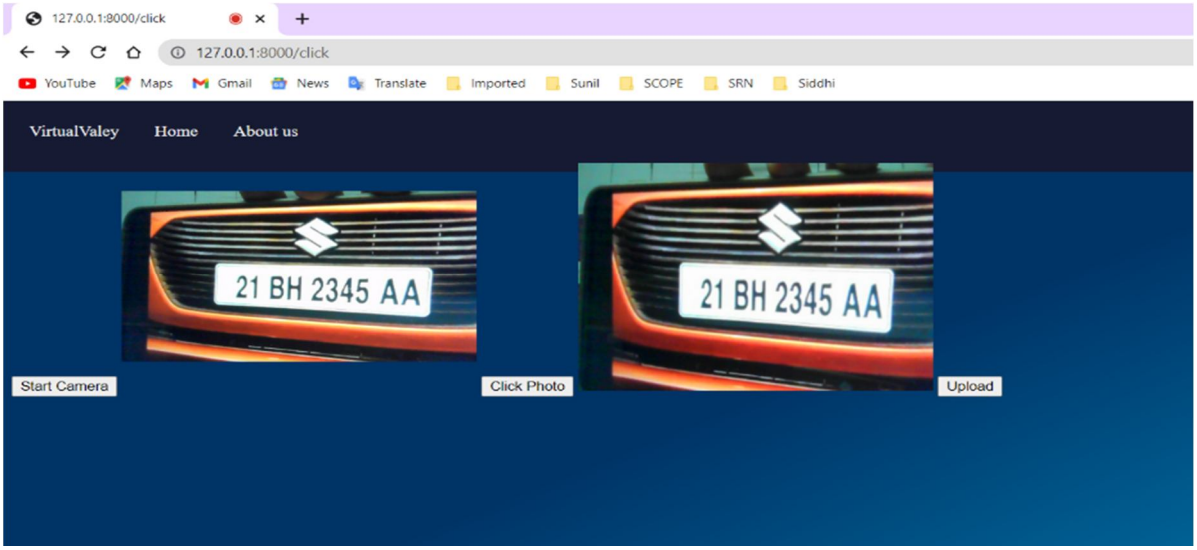

Fig 9 real time capture

9) Pytesseract output

Fig10 Pytesseract output

10) If verified it will show the details

IV. CONCLUSION

This project shows an app that uses cameras to capture a vehicle plate image and then processes it to extract number plate information. A vehicle's back picture is taken and analyzed using a variety of algorithms. Number plate extraction, character segmentation, optical character recognition, and other techniques will be applied to the image. We also intend to research the characteristics of the automatic number plate system to improve its performance.

Because ANPR systems rely on extensive optical, computational, and digital capabilities, plate identification may be delayed. The available ANPR solutions do not provide a consistent set of features for all nations; rather, each company must be provided with a well-optimized system for various parts/regions of the world, as the same system developed is insufficient and must be designed according to the region where it will be deployed, taking all influencing factors into account. OCR engines are commonly customized for specific regions. It must be ensured that the camera's installed library or engine supports the required countries. Each ANPR solution from a different manufacturer has its own set of pros and limitations. The finest of these is the one that meets the needs of the region in terms of identified system-effecting conditions.

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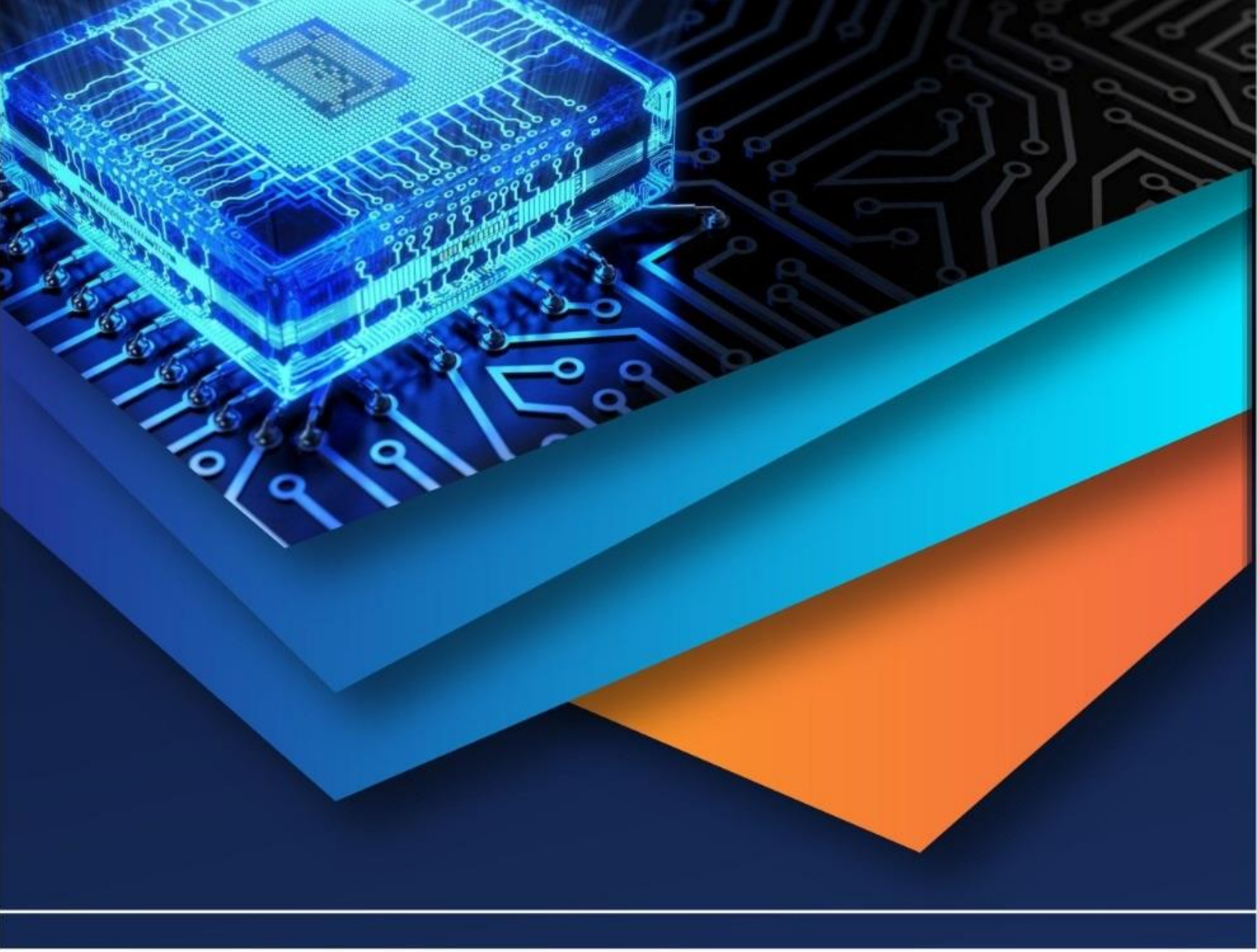

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