iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** III **Month of publication:** March 2023

DOI: https://doi.org/10.22214/ijraset.2023.49595

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue III Mar 2023- Available at www.ijraset.com

Object Surveillance Detection

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Abstract: ***Thefts have increased over the past few years. This creates a dangerous climate where people live in fear. Issues with home security are a worry in the current atmosphere. The current generation of intrusion detection systems is very expensive and prone to false alarms. Open CV and mobile devices are used to find a solution to this issue. Intruders can be precisely detected using this framework, which filters the motion of moving objects. An API by the name of Twilio will notify the user when an intrusion is made, and the video will be saved locally. This application's main purpose is to act as a surveillance system that can identify persons, recognise faces, and display user information. This lowers the possibility of future system penetration by people. This project gathers camera photos and using image comparison methods to identify intruders using the Open CV library. The streamed video will be delivered from the server to the remote administrator via the Android phone if an intrusion is found after comparison. The administrator can then take the necessary steps and locally notify her security. Users are notified by MMS, SMS, or email when notifications are sent and pertinent data is recorded. able to display videos relevant to the user. This approach improves social stability, keeps your house secure, and lowers burglaries.***

Keywords: Surveillance System, Security Surveillance And Real Time Security Surveillance, Face Detection.

I. INTRODUCTION

Video surveillance is a current field of image processing research. Analog CCTV systems were first used to observe and record people, events, and activities as well as collect information. The infrastructure for capturing, storing, and distributing video is all that is provided by the current digital video surveillance systems; humans are still totally responsible for identifying threats. Monitoring security camera footage takes a lot of time. Given how challenging it is to manually examine video material, multiple activity detection in real-time video is becoming more and more challenging. Analysis software processes video flow images while automatically identifying objects (people, equipment, and vehicles) and related events for security purposes. Alarms are set off when video surveillance systems detect security hazards in real-time. Video surveillance cameras are used because of worries about security and criminality. Banks, businesses, ATMs, retail malls, and public spaces all use video surveillance cameras. Over the past few years, network surveillance has continued to expand, according to researchers. This is a result of the unsettling events that keep happening all around the planet. Hence, we require an intelligent surveillance system that gathers data in real-time and sends, processes, and comprehends information about the subject of the surveillance. Video evidence can be used as a forensic technique to track out criminals. As a result, these systems guarantee a high level of security in public areas a feat that is typically quite difficult.

II. PROBLEM STATEMENT

It is common to find out after an incident has occurred. A recent incident in our society involved home theft, despite the presence of surveillance cameras on the premises. I was robbed. We take measures to protect and protect your home and important places from accidents such as theft and fire. We expect our homes and belongings to be safe while we are away for certain reasons. In most cases, you won't learn about an incident until after the damage has occurred. We need to find ways to deal with what is happening around our property. Install the necessary systems for the property and provide an application that facilitates the management and maintenance of the property by the user. The motivation to develop this system was because the previous system had some loopholes, such as: SMS or notification when unwanted activity is detected.

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III. LITERATURE SURVEY

To solve the security issue of house invaders, a number of intrusion detection systems (IDS) have been proposed over the past ten years. These IDSs actively identify homeowners while detecting intrusions from strangers and burglars.

1) In Paper[1], An IoT-based solution for intruder detection and monitoring was suggested by Taryudi. That detects moving objects in front of a door using an Arduino-Nano as a controller. Your home is monitored with PIR sensors. Entry into the home is restricted to those with RFID access cards. Closed Circuit Television (CCTV), a common type of home security system, can only record and capture footage; it is unable to notify you when something looks suspicious. Hence, more item identification and warning techniques are required.

2) In Paper[2], Designing a motion sensor and camera detection system was suggested by Nico Surantha. The Raspberry Pi can be reached through that. SVM recognises suspicious items or individuals who enter close to the door.

3) In Paper[3], Mrunal Khedkar recommended installing a home security system. In which a motion sensor will only turn on a camera when there is an intruder. The camera immediately activates and starts recording visual information after being triggered. With the aid of a Bluetooth or Zigbee transmission module, this recorded image data is sent serially to the base station. To collect visual data, base stations decode the information they have received.

4) In Paper[4], A burglar alarm system was Nwalozie's suggestion. to increase home security by notifying the owner through SMS when the PIR sensor detects movement at the front door. Also, a microcontroller is linked to a switch close to the entrance to display a message on an LCD monitor installed inside the house and send the user an SMS.

5) In Paper[5], Anwar suggested a design for employing IoT devices to connect an alarm to the security system. Anyone can use a smartphone to remotely access and control the front door of the property. A PIR motion sensor and a camera module are used, respectively, to detect motion and take pictures in order to bring the security system online when requested. The electromagnetic door lock module has been created and developed to operate with door accessibility.

IV. EXISTING SYSTEM AND DRAWBACKS

The market for security automation systems in offices and homes is diverse. These systems carry out a range of tasks from which you can select in accordance with your needs and tastes, taking into account the cost of purchasing these systems as well. These security systems' components cost a lot to create. To secure your assets and loved ones, make sure your home has a security system. Money has been spent by people on their personal security. Second, you should always keep your valuables secure at home. Security systems, including his CCTV cameras for continuous streaming surveillance, have been put in place to that aim. In wealthier civilizations, video surveillance is carried out with additional staff. This will unknowingly eat up your time by keeping you continually focused on your screen. Video cameras saved on external storage devices deployed in surveillance systems are used to identify intruders. But, installing, storing, and maintaining this system will cost a lot of money. After getting permission from the owner, the video content should be withdrawn in cases of low activity. As you must view the entire film and risk missing important details during analysis, this can result in lost labour hours. Direct video streaming monitoring was not possible. There are numerous intruder detection systems for security and surveillance systems now in use. Intruder detection involves human participation, costs installation time, and is susceptible to false alarms.

V. PROPOSED SYSTEM

As the previous system had various loopholes such as unauthorized access and non-immediate notifications, we developed this system to notify you by email, SMS or what is happening in and around the premises. Now you can find out. Notifies you as soon as the system detects unwanted activity. Instead of using a CCTV camera, this application converts the mobile phone camera itself into an IP webcam. It can be either the primary or secondary camera even when the phone is in on (or) off mode. The IP webcam will continue to work and all video recordings, snapshots and audio will be stored in the user's system database. Users can watch live streams even if the user and the application device are not on the same network.

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An additional feature and usage of this application is that when an unauthorized person enters your home or office, an alert message will be sent to the user's specific mobile number. This is done through an API called the Twilio API. All of these proposed works can be done using the OpenCV library and Python software.

VI. ALGORITHM

We employ a variety of algorithms to detect objects from a distance, including

A. Object Detection

Identifying instances of specific classes of semantic objects in digital photos and videos is the goal of object recognition, a field of computer science connected to computer vision and image processing.

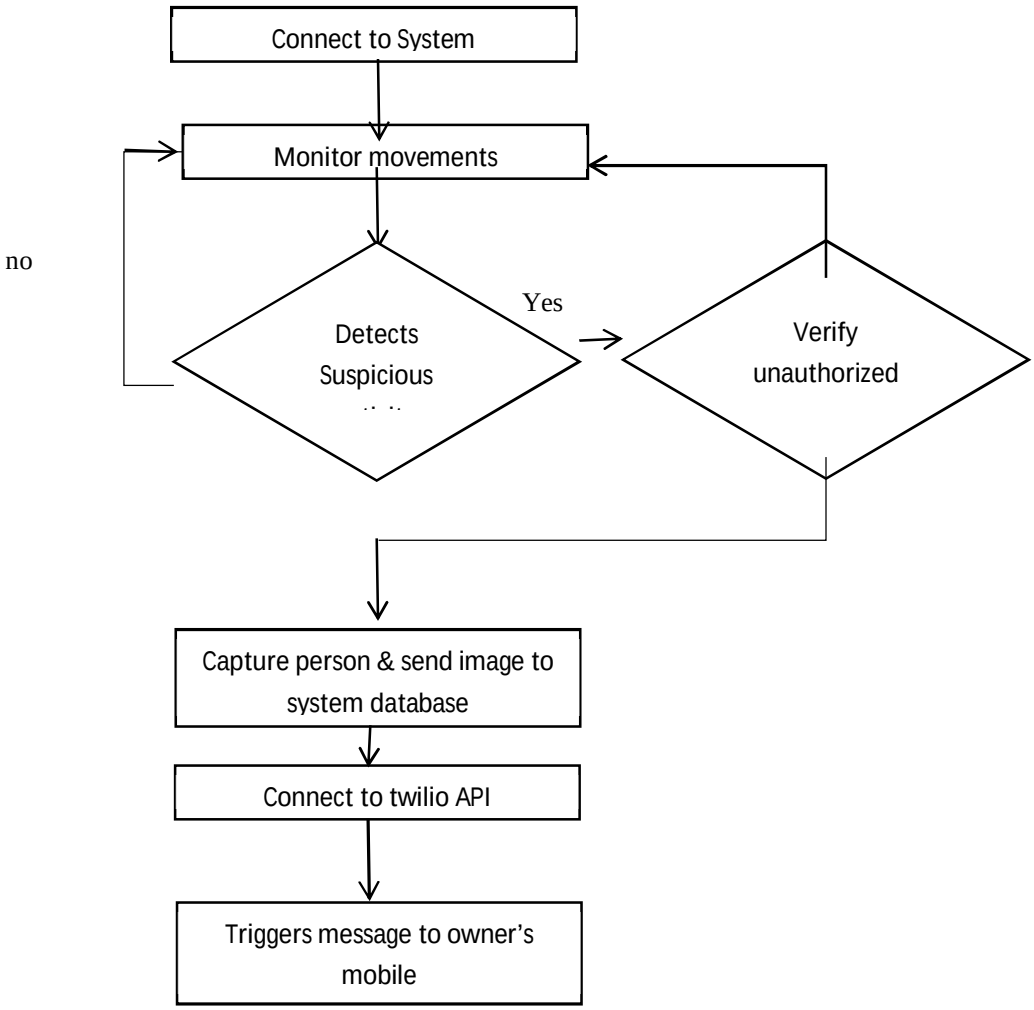
B. Motion Detection

The technique of identifying changes in an object's position in relation to its surroundings or changes in the environment in relation to an object is known as motion detection..

C. Yolo

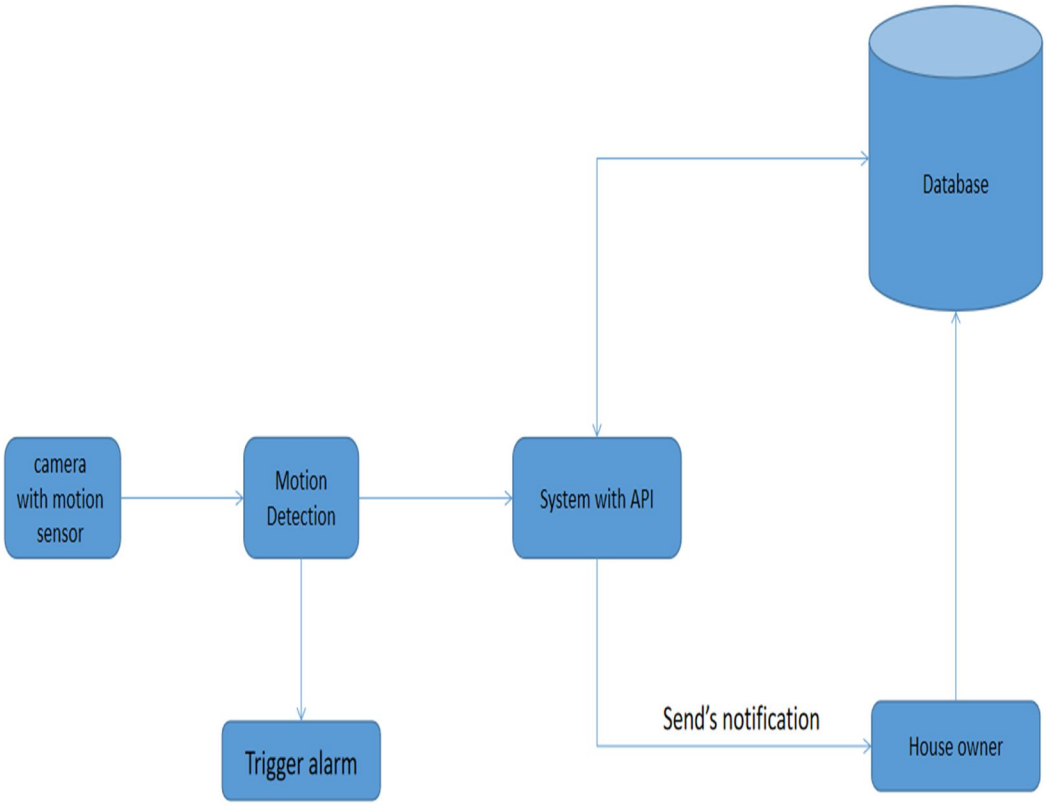
"You Only Look Once" is referred to as YOLO. This method identifies and recognises various things in an image in real time. Regression analysis is used to perform YOLO's object detection and offer class probabilities for the detected photos.

Flow Chart



ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
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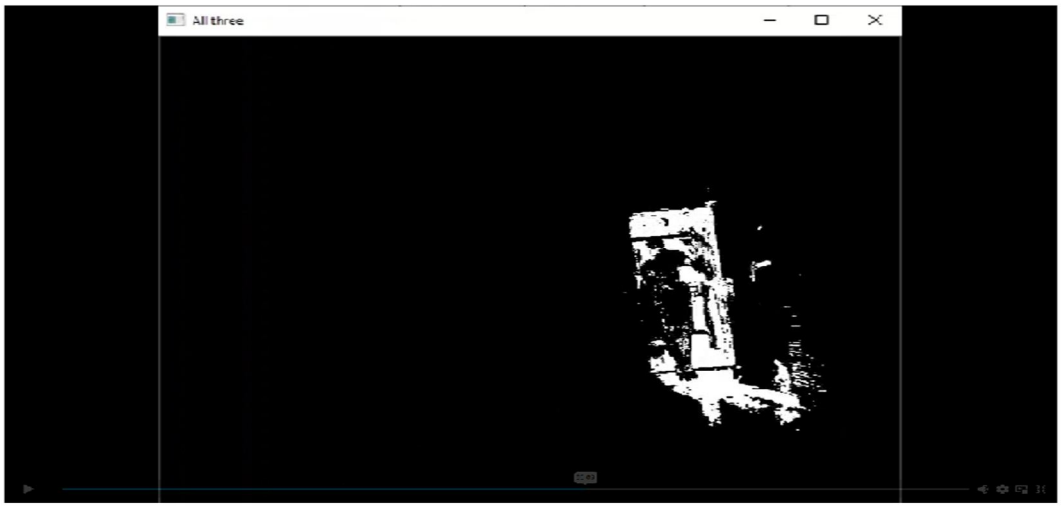
System Architecture



VII. RESULTS

A. Background Subtract

Here in figure , it is used for the background subtraction of the video. Identify the person without the background.

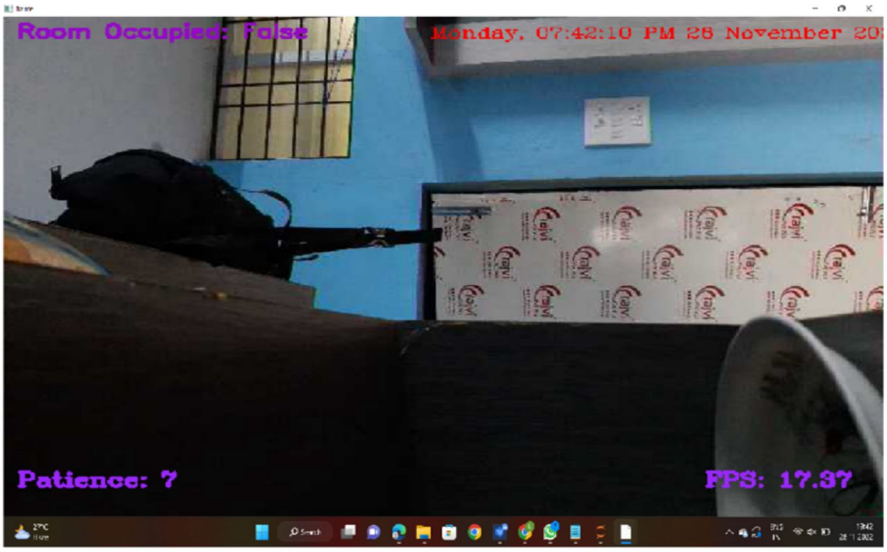


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B. Final Application Video

In this figure , this is the final application of our project where the video recording will be started and then we go for background subtraction and counter detection.

Here we can see the date and time in the video, with that we can also observe the patience value if a person enters the room the intruder wait for some time and if the patience value reaches 0 an alert message will be sent to the user mobile number



C. Sending Message To User

Here in figure, this is the final stage of our project, if a person is detected the application send an alert message to the user mobile number.this process is done by an api called TWILIO.after that the user take necessary actions on it.



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VIII. CONCLUSION

Situational awareness is considerably enhanced by the usage of intelligent video surveillance systems. With the use of such a technology, video monitoring can now be used to acquire information and gather intelligence. Intelligent surveillance systems can respond instantly thanks to real-time video analytics. Our technology recognises intrusions and notifies authorised people so they can take appropriate action. Users are promptly informed of internal scenarios through our technology, which also provides live streaming. The security module increases comfort and convenience by using both wireless and wired technologies to send notifications when an intruder is detected. This enables the owner to take any further necessary actions, preserve energy effectively, and enjoy total security**.**

IX. FUTURE WORK

The Smart-IDS that we suggest can identify burglars at the door entrance. You've received an alert about this discovery.

Because Smart-IDS has fewer parts, it is less expensive, simpler to use, and easier to operate. Future iterations of this work might incorporate mobile phone surveillance and facial recognition with cameras. For further action, send a live stream of your camera to a nearby police station.

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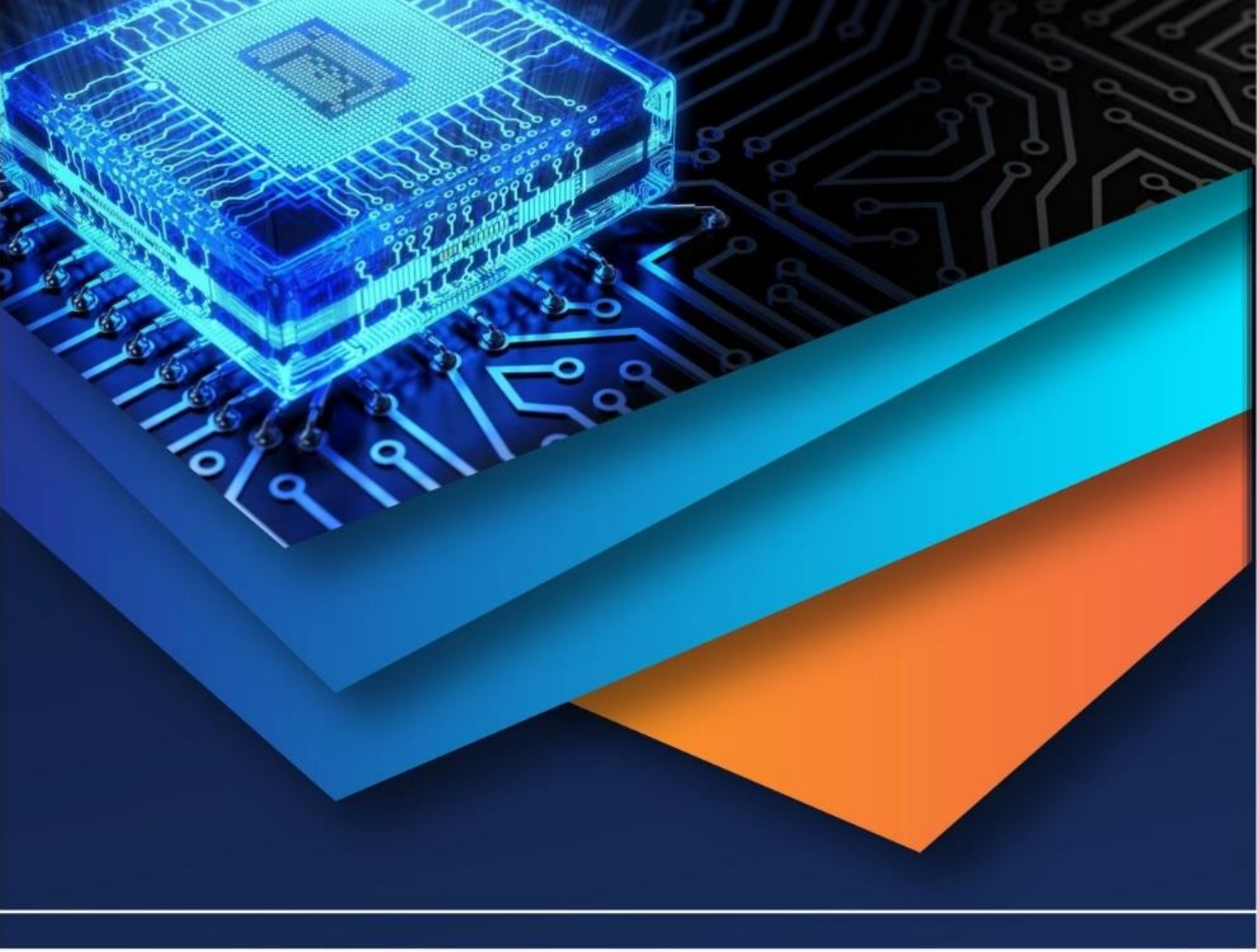
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