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Authenticating Machines by Using Human Biometric

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Abstract*: The main aim of this paper is to design and implement authenticating machines by using human biometric which can be organized in bank, secured offices and homes. In this system only authorized person can be used bank locker for recovery money. We have implemented a bank locker security system based on RFID card and GSM technology. In biometrics basic feature of human is matched to the existing data and depending on result of matching identification of a human being is traced. A face recognition system using the space invariant features transformation (SIFT) algorithm was implemented. The algorithm is based on image features approach which represents a SIFT space invariant features transformation method in which a small set of significant features are used to describe the variation between face images. The biometric and GSM security has more advantages than other system. Because biometric is stored individual identity of a person and GSM system is used for sending and receiving message.

Keywords: GSM, SIFT, RFID, camera, speakers.

I. INTRODUCTION

Biometric authentication used to detect and identify human face which is referred as characteristics of a person face image input through camera which measures all part of body. This camera can be wireless or wired. This system used sensors by scanning face or body parts. This system required digital camera to develop facial image of user for authentication.

For example: facebook uses facial recognition Software to help automate user tagging in friends.

Now a days attendance taken on attendance sheet given by a faculty member. But taking attendance of all students manually is a difficult task in large class rooms (or long list in bank locker registered book). These methods are monotonous and time consuming. It is very difficult to keep a recorded of each and every student. So there are more chances of mistake. To avoid this king of mistake we proposed this project call facial recognition referred to as a although analysis of personae face through camera. It measure overall facial structure distance between eyes, nose, mouth, and jaw edge. Proposed system consists of high resolution digital camera to monitor the class room (or registered book in bank locker). It has microcontroller based system which helps it to rotated in left and right direction. Data or images taken by the camera send to the computer for further analysis. Obtained images compared by the data of student and employees and mark the attendances. Camera can be wireless and wired system. And we introduced a new approach that gives report by SMS to parents or principles mobile using GSM modem. And also speaker created voice message.

There are two steps are required for Facial recognization.

Facial detection is related to object class detection. In object class detection it recognize location and size of all object in an image that belong to this class. Face detection algorithms focus on frontal human face. It is analogies which is detect bit by bit .That image matches the image that is already stored in the data base. If any feature is not match with the image stored in data base, it invalided the matching process. Face detection algorithm proceed based on genetic algorithm and eigen face technique. In this technique first eye region is detected by testing all valley regions in gray level image. Then genetic algorithms generate all possible face regions which include eyebrows, the iris, nostrils, and mouth corners.

Face recognition system is a computer application which is capable of identifying and verifying a person from digital image or video frame from a video source. This technique mostly used in the security system and compare with the other biometric such as finger print and eye iris recognition system. Facial recognition recognizes a facial feature such as facial landmark. An algorithm may analyze the relative position, size, and/or shape of the eyes, nose, cheekbones, and jaw. This technical is useful for searching other image with same features. Other algorithms normalize a gallery of face images and then compress the face data. Recognition technique is then divided into two approaches one is geometric which looks for distinguishing feature or photometric.

II. LITERATURE SURVEY

A. *FINGER PRINT BASED DOOR LOCKING SYSTEM(4)*

Author name:-A.Aditya Shankar1, P.R.K.Sastry2, A. L.Vishnu Ram, A.Vamsidhar4

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It uses owner fingerprint as a security password this technology is mostly used in bank lockers initially RFID verification and PASSWORD is needed. This system can be used for door locking as can be used for the attendance at any organization .As this system is used for door lock it can be used for one person only and in case of the attendance it efficient but time consuming the employees for giving these attendances have to scan these finger and if the crowed of employees is hung it will be more hectic than book registration.

III.FINGERPRINT BASED SECURITY SYSTEM FOR BANKS(3)

A. Author Name: Atar Nasrin1, Awatade Vidya2,Hegadkar Rani , Bansude Vijaysinh4

Safety has become a necessary issue for most of the people. People have become more concern about their expensive belongs. For this we can the GSM and a finger print scanning process. As we know that by using fingerprint scanner only the authenticated person can only for open the bank locker. In this when the after scanning the finger we can enter the password to open the locker and same we do to close the locker and if the finger print do not match then the message will be send by using GSM .The basic work of this system is based on the fingerprint scanner and GSM technology in this we can use different fingerprint for different lockers handled by various and different persons. The controller will be used for controlling the scanning. In the process after scanning we can enter the password using keyboard if the password is correct the locker will be opened instantly and again when the password is entered the locker will be locker. Again when any unknown person tries to open the locker the warring message will be sent to the holder/person mobile by the GSM.

IV.LOCKER OPENING AND CLOSING SYSTEM USING RFID, FINGERPRINT, PASSWORD, AND GSM(6)

A. Author Name: RaghuRam.Gangi1, Subhramanya Sarma.Gollapudi2

The main purpose of this system is to design and implement a locker with high security system based on RFID, fingerprint, password and GSM technology. Fingerprints are one of many form of biometrics used to identify individuals and verify their identify. The main advantages of this system using the RFID, fingerprint, password and GSM is more secure than other systems. This technology can be used to identify, track, sort or detect a wide variety of objects. This system consists of microcontroller, RFID reader, GSM modem, fingerprint scanner keyboard and LCD. The RFID reader read the id number and sends to the microcontroller, if id number is valid it gives access to the fingerprint scanner otherwise it stops the process and if the fingerprint is matched the microcontroller send the password to the person mobile number and then the person will enter both password and if the password is matched the locker will open and if the password is not matched an error message will be sent on the persons mobile phone and the locker will remain locker. When the fingerprint is matched the microcontroller will send a password to the authenticated persons mobile. When the person enters both the passwords and if the passwords match then the lock will open and if the passwords do not match it will remain in the locker position. RFID fundamental means RFID is an effective automatic identification technology for variety of object. The important function of RFID its ability to track the location of item the RFID tags can be classification into three categories active tags, passive tags and semi passive tags and the RFID can be read and write tags. They operate in three frequency ranges low frequency, high frequency and ultra high frequency.

V. ADVANCE LOCKER SECURITY SYSTEM (7)

A. Author Name: Prof R. Srinivasan,2T.Mettilda, 3D.Surendran, 4K.Gobinath,5P.Sathishkumar

In bank her that person or employee which is free at that time it causes fraud. Many time, and it is time wasting of both costumer and employee. There is robbery causes in bank, or fake people try to access others account. So to reduce such action and for the safety of locker this project is made called “ADVANCE LOCKER SECURITY SYSTEM”. This system requires RFID, PASSWORD, CONVEYER, HEAT SENSOR and GSM. This system allows only authentic person to recover money from locker. This security system consist of automatic movement of locker , easily activate , authenticate , validate the user manual in real time for secured locker system. With RFID we can sort, track and detect verity of object and GSM send password to the mobile of that person. If that password accept by the locker then that person access that locker, otherwise alarm is on-again in addition to that heat sensor can senesce the heat if any one try to access locker by electric machine which produce heat. No reliability on the person and time wasting is the drawback of this system. In this technology RFID used is used for holding users information like locker number, user name etc… the Locker have a keypad to enter password which is receive by a that person by GSM system. Locker access if passed entered is correct, if not the alarm is turn on. If anyone tries to access that locker by machine, then heat sense or essence heat which is produced by that machine.

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VI. SMART ATTENDANCE USING REAL TIME FACE RECOGNITION (SMART – FR)(7)

Author Name: J. G.. Roshan Tharanga 1*, S. M. S.C. Samarakoon 2, T. A. P. Karunarathne2, K. L. P.M. Liyanage 2, M. P. A. W. Gamage2, D. Perera.2

Smart –FR is the information system which is used for the attendances using real time face recognition. This system is used in companies so they can recognize these companies. The techniques used in this system are principle component analysis (PCA) and haar cascade. This system consists of standalone application which is linked with centralized database the process consist of capture frame from live camera, detecting faces, adding to training list, Store in database matching with facial image I'd etc. The system was developed in such a way that the employees should face directly at the camera. The employee should look as same as what he had given as ID. If these are few changes like glass as bearded they have to change these ID as per new look. As per the study done for this system the system works 68% accurately with the proper photo ID with system which is relatively low as compare to awn system.

VII. AN EFFICIENT MULTISTAGE SECURITY SYSTEM FOR USER AUTHENTICATION(2)

A. Author Name: PRERNA MEDHI

Today security is the most important issue of all people in our daily life. By using this system we will have a reliable security system by using this we would be able to verify the correct and incorrect person. The security system that we used consists of with the RFID technology .At the first stages in these types of security systems we used the security cards when we punch this cared the serial number is read by the RFID reader and then it is given to the microcontroller. Then the microcontroller then compares the data with the existing data. After comparing the data is this data matches with the existing data then the person is authorized uses and if the data do not matches with the existing data that means the user is unauthorized. Becomes of this the buzzer starts ringing and a message is sent to the authorized person through GSM module. Again the second step in this steps we enter the specific passwords. When the person enter the password through keyboard if the entered password is correct then it will reach to the third stage and if again the password is wrong then a message will be given to the authorized person using GSM module. Again at the third stage if the password or his RFID tag is correct then he have to scan this fingerprint onto the fingerprint module and if it matches to the existing fingerprint that is stored in the system then the lock opens and the person gets the access otherwise it will be denied.

VIII. PROBLEM DEFINITION

A biometric is a unique measurable character of human being can be used automatically recognize an individual or verify individual. A major stage which is used to generate set of image features:

A. SCALE SPACE EXTREME DETECTION

The first stage of computation searches over all scales and image locations. It is implemented efficiently by using a difference-of-Gaussian function to identify potential interest points that are invariant to scale and orientation.

B. KEY POINT LOCALIZATION

At each candidate location, a detailed model is fit to determine location and scale. Key points are selected based on measures of their stability.

C. ORIENTATION ASSIGNMENT

One or more orientations are assigned to each key point location based on local image gradient directions. All future operations are performed on image data that has been transformed relative to the assigned orientation, scale, and location for each feature, thereby providing invariance to these transformations.

D. KEY POINT DESCRIPTOR

The local image gradients are measured at the selected scale in the region around each Key point. These are transformed into a representation that allows for significant levels of local shape distortion and change in illumination.

This approach has been named the Scale Invariant Feature Transform (SIFT), as it transforms image data into

Scale-invariant coordinates relative to local features. An important aspect of this approach is that it generates large numbers of features that densely cover the image over the full range of scales and locations. A typical image of size

500x500 pixels will give rise to about 2000 stable features (although this number depends on both image content and

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choices for various parameters).

Global System for Mobile (GSM) is a second generation cellular standard developed to cater voice services and data delivery using digital modulation.

IX. OBJECTIVE

Face recognization is integral part of biometrics. A face recognization system using scale invariant feature transformation (SIFT) algorithm was implemented. Algorithm based on image features using SIFT method in which small set features are used to describe variation between face images this system also focuses. Management information system (MIS) of student using biometric (face detection) technique for safety it gives SMS to parents using GSM.

X. DISCRIPTION OF PROPOSED WORK

A. Face detection is a part of biometric

1) Camera is used for capture image.
2) Pc MATLAB, GUL tool implement.
3) External feature is MATLAB; we connect MATLAB to electronic IC.
4) Max 232 IC circuit is required for standard voltage this IC provide best noise rejection.
5) It referred (max 232 IC chips) as line drivers.

B. Major stages of computation used to set image features.

1) Scale space extreme detection.
2) Key point localization.
3) Orientation assignment.
4) Key point descriptor.

XI. BLOCK DIAGRAM

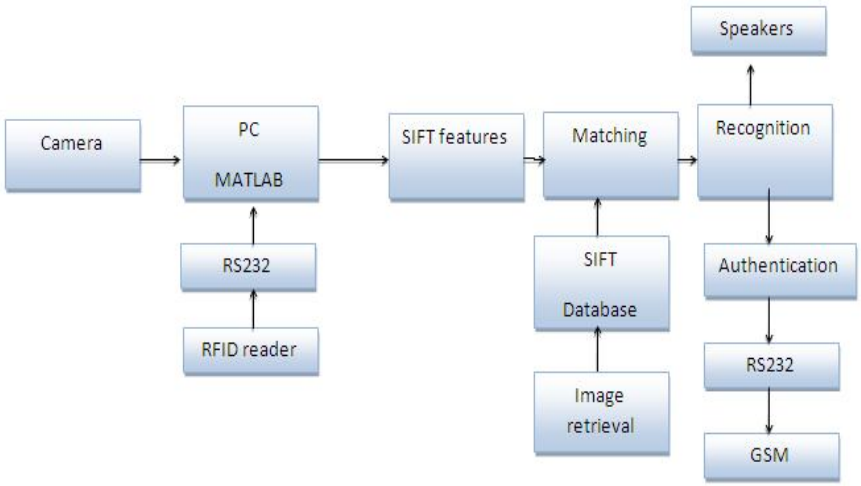

figure1: multi access control system by face image using SIFT Algorithm.

I have two input in this paper first is RFID card and second is MATLAB through data base capture the image and save this image. And this paper to have four output first is speaker voice created the message and second is GSM through message goes to security section and third is LCD display message on a screen. And fourth is text to message display on a screen authenticating or un authenticating.

RFID reader card this is the smart card. We perform the operation with RFID reader card and then RS232 IC is connected to software with series communication. Then camera capture the image and verify this matlab software and then these measurements are retained in a SIFT database and used as a comparison when a user stands before the camera.

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Working:-first a for matlab through capture the image and then database save this image. Then software to SIFT features check the fully facial expressions and RFID card are scanning then going to software. SIFT database compare the image with camera image when this image are matching then perform the next process recognition authenticating otherwise un authenticating. RS232 IC series communicating then GSM service send to message security services and if any condition is false then alert message goes to security section.

XII. APPLICATION

A. Commercial use

1) Security such as banking, public area, mall.

2) Business area, industry.

B. Government use

1) Counter terrorism, legislature.

XIII. FUTURE SCOPE

A. Fingerprint module

B. IRIS scanner for best securities.

XIV. ADVANTAGES OF FACE RECOGNITION

A. Non instruction: Other biometrics required subject co-operation and awareness.

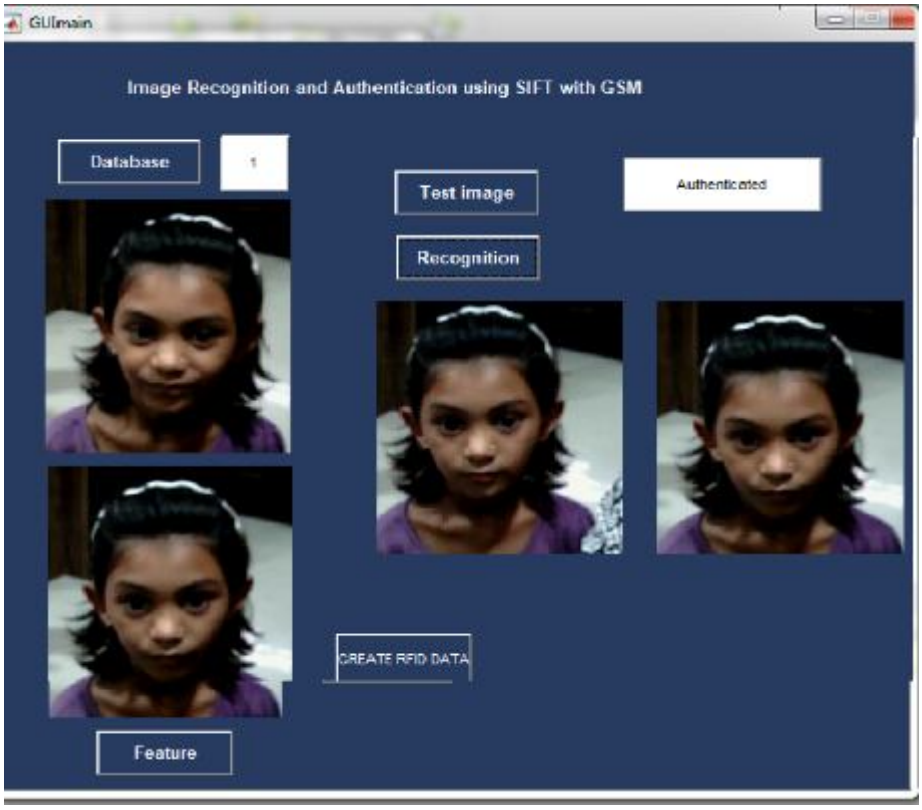
B. Biomertric data readable and can be verified human.

C. No association with crime.

XV. EXPERIMENTAL RESULT

Whose id will be registered will get register id card. The locker will be opened using this card and current image. Image and facial fully experience will be saved in data base and after that through speaker voice message LCD recognition if will be matching authenticating otherwise non matching face is a un authenticating.

A. REGISTERED ID OUTPUT



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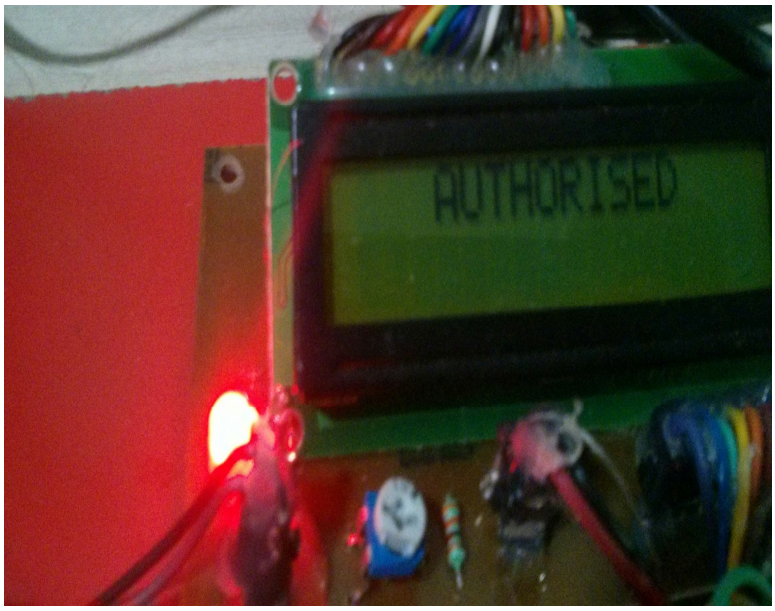
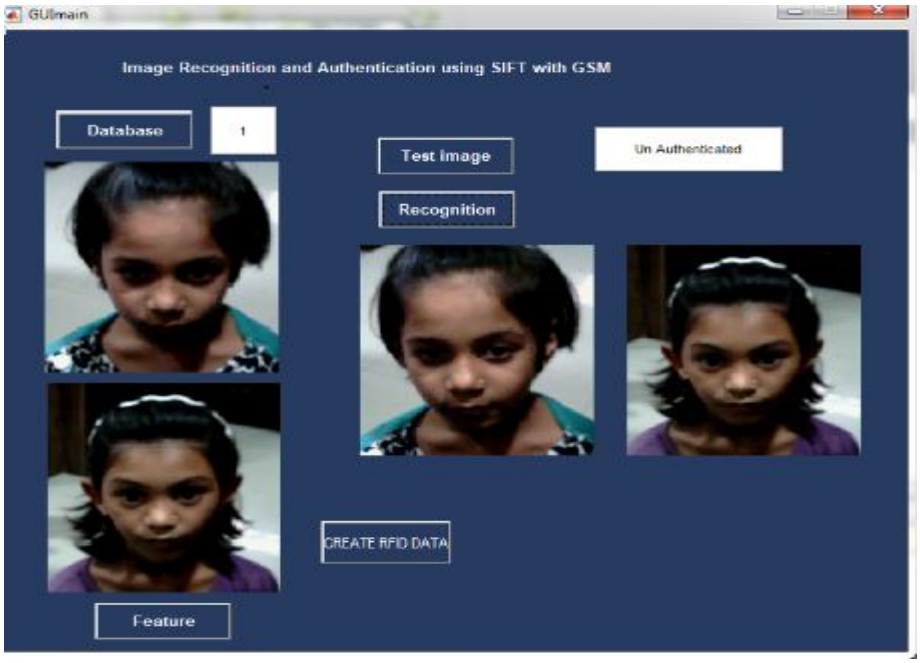
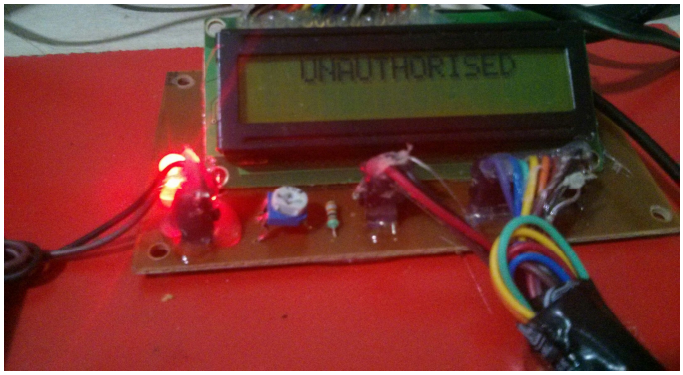
B. REGISTERED ID TO LCD DISPLAY ON A SCREEN MESSAGE



C. UN REGISTER ID OUTPUT



D. UNREGISTERED ID TO LCD DISPLAY ON A SCREEN MESSAGE



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XVI. CONCLUSION

In this paper, we first detect and identify the human face. Then this face is recognized based on the comparison of characteristics of the face already stored in database and facial fully expressions stored in SIFT features. Finally, an SMS alert is sent and speaker created voice message is given to authorize the person. And the implemented project provides a locker system with RFID, password verification, GSM technology. It provides more security facilities. In this the future extension can be made by adding the Digital Image Processing for face recognition. It will ensure high security. This paper presented an approach for enhancing security of the multibiometric systems as the system is equipped with the SIFT descriptor which improves the performance of image matching in the sense of achieving higher efficiency and This study provided a new approach to fetch the fraudulent persons.

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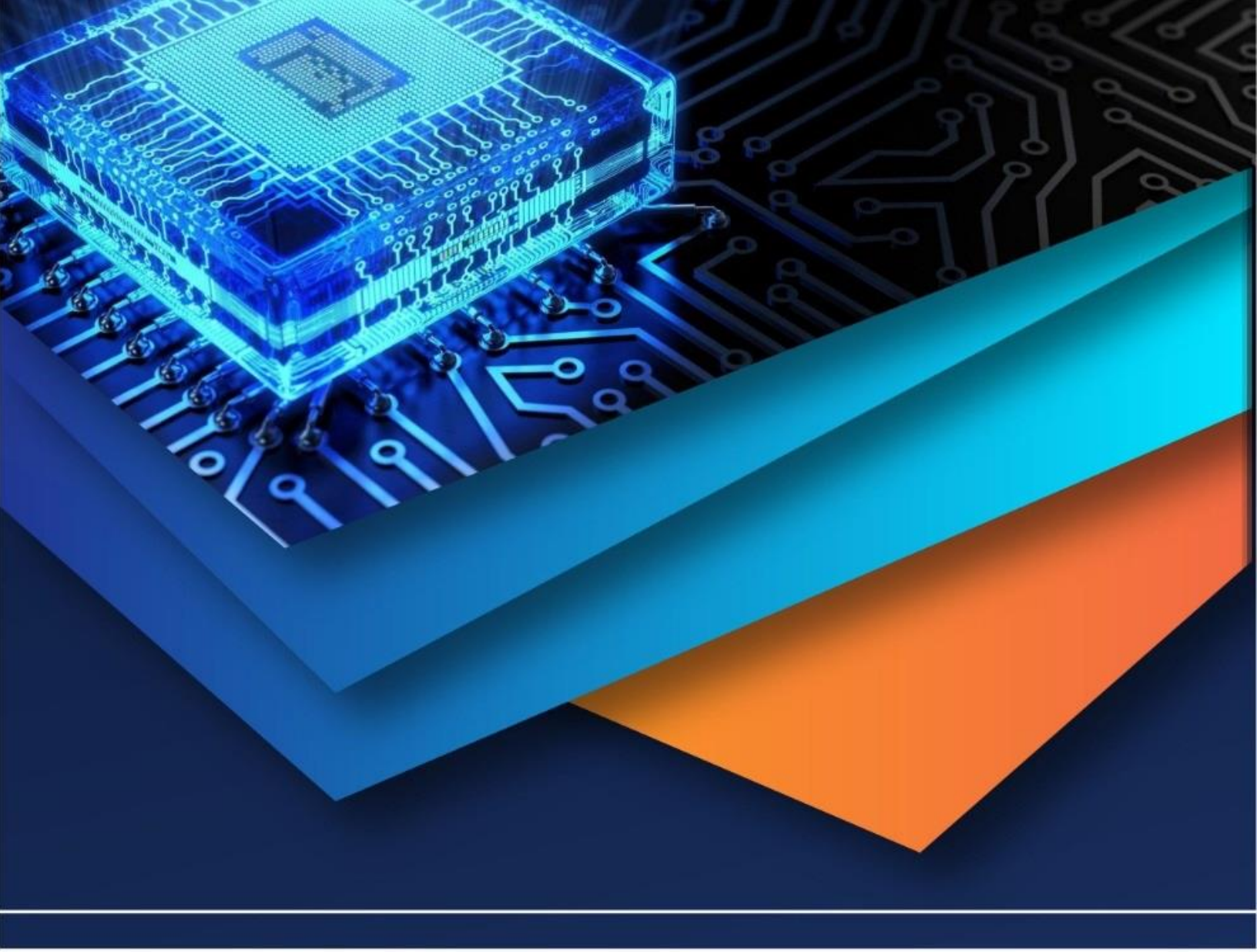

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