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RFID Based Vehicle Entry System

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Abstract: ***Each organization provides transportation vehicles and employs people to keep records of the entry and exit of those vehicles. The entry and exit times of vehicles are recorded using RFID. Radio frequency identification (RFID) is a wireless technology system consisting of her two components of a tag and a system. Radio frequency identification (RFID) is also used for vehicle monitoring. How the use of electromagnetic or capacitive coupling in the high-frequency portion of the electromagnetic spectrum draws attention to objects, animals, or people. An RFID chip contains a radio transmitter that transmits a coded identification number when interrogated by a reader. Some of his RFID tags can be inspected from a few meters away, out of sight of the reader. Bulk reads allow near-parallel analysis of tags. This small type is incorporated into customer products for identification and even implanted in pets.***
RFID has many uses in our daily life. Tags can be attached to any object and used to track and manage inventory, people, and more. For example, it can be attached to vehicles, laptops, books, cell phones, etc., and the owner or student can use her Google spreadsheet to track the vehicle by location. User can scan her QR or access Google Sheets.
Keywords: Transportation, Vehicle monitoring, (RFID) Radio frequency identification, (LOS) Line of sight, web apps, Google sheets.

I. INTRODUCTION

Each organization contains vehicles for transporting people and goods. So we hire people to document the entry and exit times of these error-prone vehicles, and we can't track the vehicle's location in an emergency. The team's solution: using RFID (Radio Frequency Identification). , records the time of entering and exiting the vehicle, saves the data so that it can be called up at any time, and uses a fingerprint module attached to the vehicle door. Authorized persons have access to the vehicle. The
Gate Access Control can automatically identify vehicles and drivers using RFID. The ability to grant or deny access based on vehicles equipped with RFID tags is a valuable way to provide a perimeter or increase security levels. These systems prevent unauthorized vehicles from occupying spaces and people from entering secure buildings and IOTs. RFID technology is therefore perfectly suited for use in secure vehicle applications. B. High security vehicle access at airports, seaports and mines. It also relates to parking lots, gated communities, staff parking, and quick and convenient access for vehicles to campus.
As the number of private and commercial vehicles increases rapidly by the day, vehicle identification becomes an increasingly complex task. This is especially true when vehicle movements on and off the premises need to be identified and recorded. Such tasks have typically been accomplished primarily through human intervention.
DAPHNE's vehicle identification solution offers a much higher level of automation and efficiency for such situations by using RFID-based vehicle identification technology that largely eliminates the need for human intervention. increase. By attaching a RFID tag to the vehicle, the solution is robust, faster and more accurate than traditional methods.

II. LITERATURE SURVEY

[1] created an RFID-based vehicle access system. This is used to access the vehicle if the vehicle details match a database of vehicles already registered. The system also records data such as vehicle details, vehicle entry time, vehicle exit time, vehicle current location and capacity. There is no human involvement in this system. In
[2] they developed a system that is very useful in many organizations in today's society. Because all organizations provide transportation. The proposed model is not only used for vehicle access, but also provides more information about the vehicle, such as vehicle capacity, live location, vehicle entry time and vehicle exit time.
A system combining an Arduino microcontroller and an RFID module, a servo motor was designed and manufactured [3]. Used to develop vehicle access control using RFID to automatically identify vehicles and drivers already registered in a database. This design was created for added security.

In this system [4] when the bus arrives, it goes through the gate level. His RFID tag on the bus is scanned in the second step. The RFID reader reads RFID tags in the third step. When the RFID matches the list on the bus, the servo opens the gate. Data read by RFID stored in an Excel sheet.

[5] Bus details will be displayed via web once the driver updates the location details. Update data from the web is reflected in Google Spreadsheet

From Google Sheets, users can access the QR or click a link to access the data. A user's current location can be easily retrieved via Live Location.

[6] The details of the RFID tag attached to the vehicle are scanned by the RFID reader and stored in a database so that the RFID tag details match those already available, then the servo motor is used to drive the gate is opened and the vehicle details are also entered into the database.

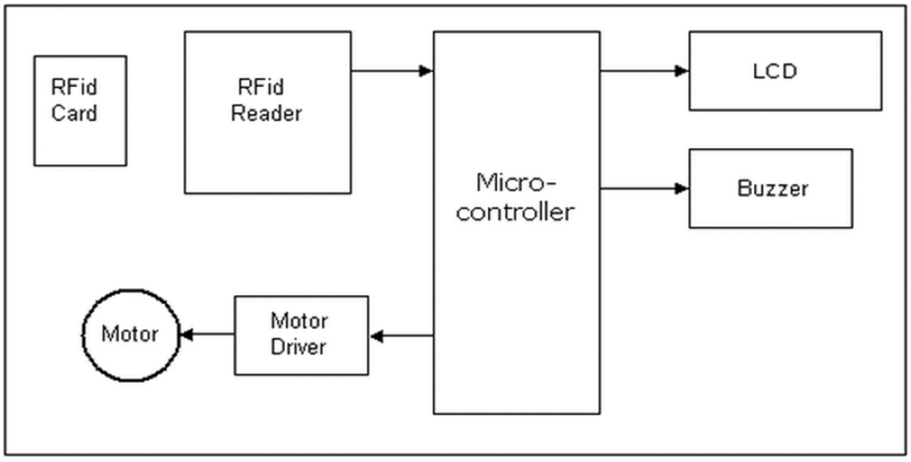
[7] Created a system using RFID to improve security. RFID technology is therefore perfectly suited for use in secure vehicle applications. B. High security vehicle access at airports, seaports and mines. It also relates to parking lots, gated communities, staff parking, and quick and convenient access for vehicles to campus.

[8] In the future, for further development and improvement of the project, new features should be added to the design, including, first of all, additional RFID readers for exit gates. Long-range RFID readers should also be considered. Second, the design should have a larger display to fully display the information of vehicles entering campuses and other organizations, eliminating the need to check-in to a database. Third, the system should use a high-end database that can store data and images directly. And finally, future researchers could incorporate a vehicle counting system for more convenient vehicle monitoring.

III. PROPOSED METHODOLGY

The proposed system is used to address this issue. It solves the problems of current systems and focuses on RFID-based vehicle access and surveillance systems. And since RFID was used to collect access databases, the technology has grown even more. His one key input is his RFID reader, which recognizes tags from vehicle owners, and an ultrasonic sensor, which recognizes vehicles. When you register the driver, the LED lights up and the servo motor opens the barrier gate at the same time. However, if the driver is not registered, the barrier remains closed. This method also provides details of bus capacity and allows you to enter the area at any time using RFID. You can also get information on bus pick-up and drop-off times with easy access to bus locations via Live Location**.**

IV. BLOCK DIAGRAM



V. PRINCIPLE OF OPERATION

A. Arduino Uno

The Arduino Uno is an open source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board has a set of digital and analog input/output (I/O) pins that can be connected to various expansion boards (shields) and other circuitry. The board has 14 digital I/O pins (6 with PWM output), 6 analog I/O pins, programmable with Arduino IDE (Integrated Development Environment) via USB type B cable.

It can be powered by a USB cable or an external 9 volt battery, but accepts voltages between 7 and 20 volts. The also offers various communication interfaces including two I2C and SPI ports, three UARTs, a USB port and a CAN port. The Arduino bootloader is pre-flashed with this development board.

B. RFID Fixed Reader

Each reader contains a radio frequency transceiver, antenna, and reader logic board in a weatherproof unit. The reader collects data from the antenna, processes the data, and connects to VehicleTrack software.

1) Multi-tag reade
2) Integrated antenna
3) Up to 10m read range
4) ISO18000-6C EPC Class 1 Gen 2
5) Weatherproof housing

C. RFID Tag

You can save or overwrite information about the vehicle. Windshield tags are optimized to attach to the windshield of a vehicle and are primarily used to identify vehicles in campus/community parking lots.

1) 860-960MHz band
2) Tamper-proof
3) Protocol ISO 18000 6C EPC Class 1 Gen 2

D. Servo Motor

A servo motor is a rotary or linear actuator that provides precise control of angular or linear position, velocity, and acceleration. It consists of a suitable motor coupled with a position feedback sensor. Use a servo motor to control the gate, scan the RFID tag, and the gate will open automatically.

A servo is a feedback mechanism that rotates (0-180 degrees) based on incremental rotation feedback. Based on user input, it rotates in the form of stripes. The

used an MG95 servo motor with plastic gears instead of metal gears.

E. Power Supply

A 9-volt battery or 9-volt battery is an electrical battery that provides a nominal voltage of 9 volts. Actual voltage is 7.2 to 9.6 volts depending on battery chemistry. Batteries of various sizes and capacities are manufactured. A very common size is known as PP3 and was introduced for early transistor radios. The PP3 is a prism with rounded corners and at the top he has two snap polar terminals. This type is commonly used for many applications including household applications such as smoke and gas detectors, watches and toys.

This project used a 9V power supply for the Arduino. This helps power the circuit and the components within the circuit. The primarily provides devices with battery chargers, lithium-ion batteries, 12V power adapters, and can also use laptop power adapters.

F. Jumper Wires

A hookup wire (also known as a jumper, jumper wire, or Dupont wire) is a group of wires or cables that have connectors or pins at each end, usually connecting components on a breadboard or other connector. used to connect. Prototype or test circuit. Do not solder in or on other devices or components. A jumper wire is a simple wire with pins on each end that he can use to connect two points without soldering. Jumper wires are commonly used on breadboards and other prototypes to make it easier to modify the circuit if necessary.

G. LED

A light emitting diode (LED) is a semiconductor device that emits light when an electric current is passed through it. At this time, holes from the p-type semiconductor and electrons from the n-type semiconductor recombine to generate light.

Uses an LED that lights up when an RFID tag is read. Lights up when the RFID reader successfully reads the RFID tag.

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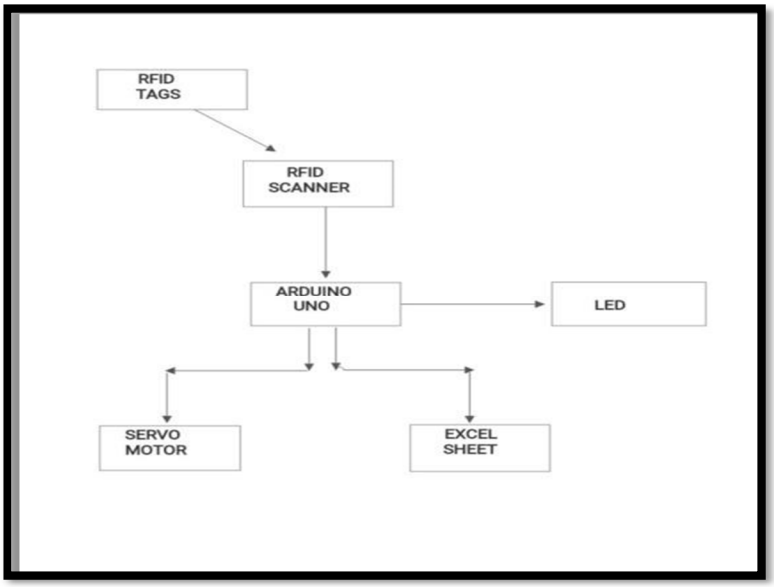
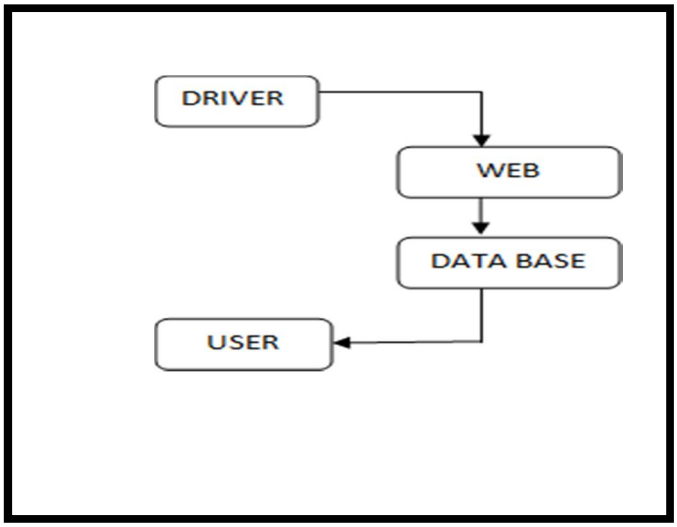
VI. WORKING



1) Step 1: When the bus arrives, pass through the gate level.
2) Step 2: In the second step his RFID tag on the bus is scanned.
3) Step 3: In the third step the RFID reader reads her RFID tag.
4) Step 4: If the RFID matches the list on the bus, the barrier is opened with the servo.
5) Step5: The data read from RFID is saved in the Excel sheet.



Use this block when the user needs the location of the bus so that it can be easily accessed. This block diagram can be explained in four steps.

1) Step 1: If the driver updates his location details, bus details via his web.
2) Step 2: The updated data from WEB is transferred to Google Spreadsheet.
3) Step 3: From Google Sheets, the user can access her QR or click a link to access the data
4) Step 4: The user's location can be easily retrieved from the live location.

VII. RESULTS

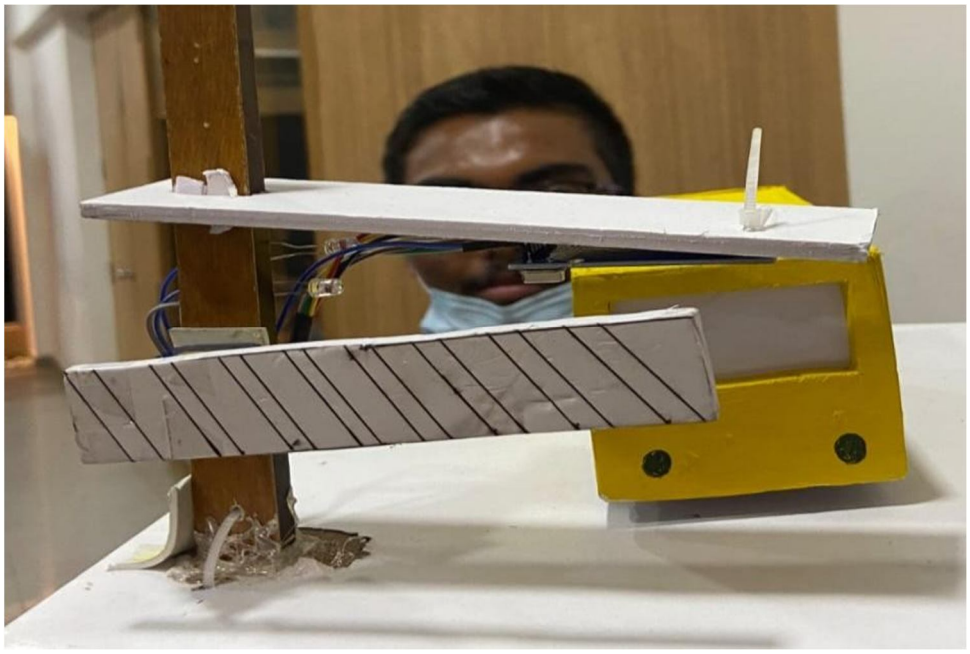


Fig1: Design of the project

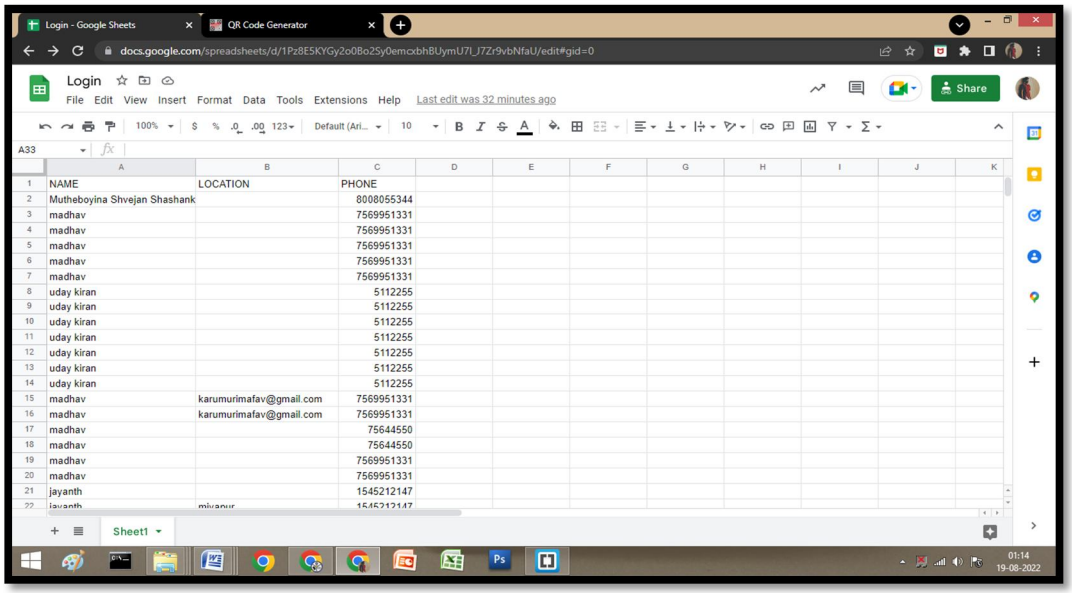


Fig4: Driver location

VIII. FUTURE SCOPE

Use this block when the user needs the location of the bus so that it can be easily accessed. This block diagram can be explained in four steps.

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3) Step 3: From Google Sheets, the user can access her QR or click a link to access the data
4) Step 4: The user's location can be easily retrieved from the live location

IX. CONCLUSION

The project proposed a computerized system that would automatically identify an approaching vehicle, record the number and time that the vehicle belongs to an authorized person or group, and automatically open the toll gates. is further development. As an overall conclusion of theproject, we have successfully prototyped the robot as shown. A computerized system automatically identifies approaching vehicles and records the vehicle number and time. If the vehicle belongs to an authorized person or group. Automatically open the tollgate. We have successfully developed the prototype shown in the figure and are investigating the prototype within our organization to test its recognition of RFID tags and the fingerprints of enrolled individuals. Based on the results of the investigations, it was concluded that the developed RFID vehicle access system was successfully tested and proven. This is achieved by providing a database for all registered vehicle owners using the RC522 RFID module. Additionally, the developed RFID-based vehicle surveillance system has been tested and works as intended. I have found it to be functional and reliable.

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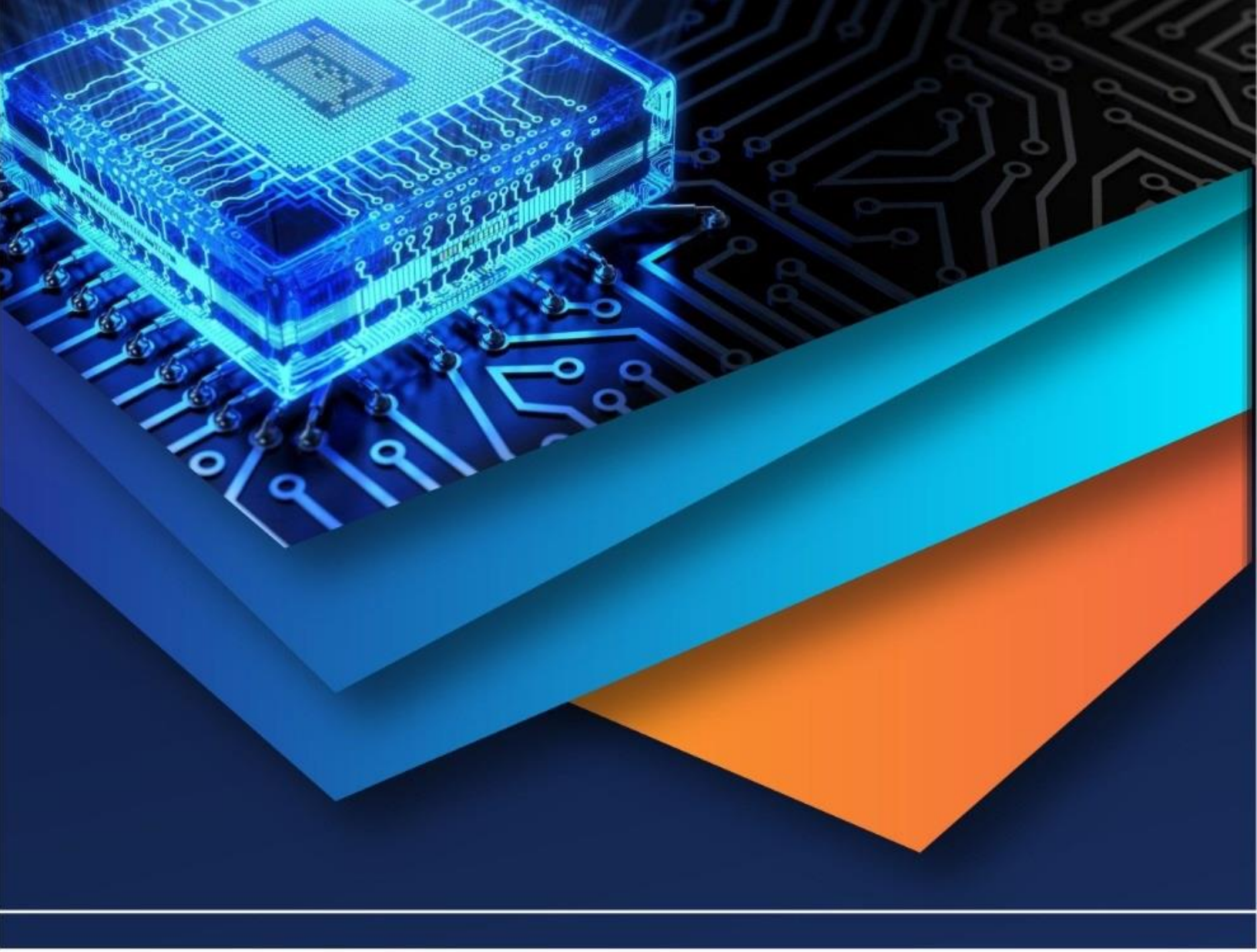

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