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Advanced Vehicle Monitoring System

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Abstract: ***The Concept of "Advance Vehicle Monitoring System" is only following of the vehicle by utilizing the GPS and the Wi-Fi module gadget. The burglary of the vehicle is expands step by step to take care of these issue, we are building up the idea of the GPS beacon which is set inside the vehicle. Right off the bat we need to pass an extremely little measure of current which function as the detour method for beginning the Engine. As the current is get interfere with our framework can distinguish that the client or individual isn't attempting to begin motor by another path and around then by utilizing the WIFI module we get the message on our versatile that somebody endeavouring to stolen our vehicle. Another idea with respect to the fuel marker works by utilizing the heap cell. Burden Cell help us to identify the accurate dimension and measure of the fuel which is available in the tank and by estimating the amount of that fuel it shows us that in certain sum our vehicle will go specifically separate. For example in 1ltr vehicle will travel 5km. So here by utilizing the GPS procedure it will shows us the closest fuel station yet here and there it happen that some fuel station are shut or no fuel away to them. To take care of above issue GPS encourages us to explore the closest and in working condition fuel station on our vehicles dashboard so client can without much of a stretch came to there. The following utilization of the Load cell for the fuel discovery procedure is that it will assist us with detecting the precise amount of the fuel which is to be appears on fuel station machine while filling the fuel. So the fundamental favourable position of these is to keep the fuel stole at the fuel station. Additionally giving answer for the "Drink and drive" cases we are utilizing the Alcohol discovery sensor which recognize the dimension of the Alcohol and according to the set dimension in the event that it goes high, at that point by utilizing the particular measure of current the vehicle motor get bolted till the clients Alcohol level is low as indicated by the predefined level.***

Keywords: **GPS, Alcohol, Wi-Fi, Load cell, etc**

I. INTRODUCTION

The propelled vehicle following framework is produced for following of the vehicle by utilizing the GPS module gadget. This proposed framework won't just ready to follow the vehicle yet additionally ready to find the remaining just as voyaging position of the vehicle. The actualized framework comprises of a fuel pointer which works utilizing the heap cell. The reason for utilize the Load cell for the fuel identification system is that it will distinguish the careful amount of the fuel accessibility in vehicle. With is load cell sign framework will ready to show the separation which will be canvassed in present fuel. For these we are having another idea that it likewise demonstrates the closest and working fuel station on the dashboard of the vehicle. With the goal that client can without much of a stretch figure out how to achieve that fuel station. At that point as an answer for the "Drink and Drive" case the liquor identification sensor has been utilized which will contrast the dimension of the liquor and set dimension. On the off chance that it goes high, at that point the Engine gets bolted. It opened simply after when client is thoroughly steady or beneath the set dimension of liquor.

A. Need of Project Work

The need of the GPS following framework is exceptionally important step by step in light of the fact that the sudden increment in populace there is additionally the expansion in the robbery since a few people don't have capacity to learn and satisfy there prerequisite so they pick the way like burglary. To shield our vehicle from cheat's we are utilizing the following framework. The motivation behind burden cell to demonstrate fuel which we are utilizing in our framework is that there are such a large number of individuals which leave there just city, town for a specific reason. Again there are such a large number of explorers over the world; so there are more odds of fuel level abatements. By utilizing load cell individual can see how far he can travel and how far he's from next fuel station so there are less odds of ceasing of vehicle.

B. Objectives

1) To prevent our vehicle from thief.
2) To Measure the exact Quantity of fuel.
3) To Navigate the Nearest Working fuel station.
4) To reduce the rate of Accidents which are caused by “Drunk& Drive”

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II. LITERATURE SURVEY

Since the introduction of GPS Navigation systems in the marketplace, consumers and businesses have been coming up with innovative ways to use the technology in their everyday life. GPS Navigation and Tracking systems keep us from getting lost when we are in strange locations, they monitor children when they are away from home, keep track of business vehicles and can even let us know where a philandering partner is at all times.

An advanced vehicle monitoring and tracking system is designed for monitoring the vehicle from any location A to location B at real time and provide safety environment to the traveller. The proposed system works on Global Positioning System (GPS) and Global System for Mobile Communication (GSM) which is used for vehicle tracking and monitoring mechanism. [1]

GPS is one of the technologies that are used in a huge number of applications today. One of the applications is tracking your vehicle and keeps regular monitoring on them. This tracking system can inform you the location and route travelled by vehicle, and that information can be observed from any other remote location. It also includes the web application that provides you exact location of target. [2]

This system enables us to track target in any weather conditions. This system uses GPS and GSM technologies. The paper includes the hardware part which comprises of GPS, GSM, At mega microcontroller MAX 232,16x2 LCD and software part is used for interfacing all the required modules and a web application is also developed at the client side. Main objective is to design a system that can be easily installed and to provide platform for further enhancement.[2,5] A safe driving system of vehicle for drunk and driving cases, In this project we have used an alcohol detecting sensor in vehicle which senses and detects alcohol gases and sends messages continuously to their relatives within every 5 minutes. In this process arm7 microcontroller is connected with GSM and GPS modules. GPS module gets the position of vehicle with longitude and latitude then via GSM it sends the messages to the relative of the driver until he reaches home safely. We have also used car accident prevention technology with ultrasonic sensor which also sends messages via GSM to relatives of the driver while accident happens of vehicle. [1, 4]

III.SYSTEM DEVELOPMENT

The figure 1 shows the block diagram is the basic working Module of the “Advanced Vehicle Monitoring System”. In the above block diagram we are using the Arduino Uno Board. The reason behind these is nothing but it’s a Modern version on processor. It can support number of sensors and gives the output than later microcontroller’s versions.

In this system we are Interfacing the GPS module to the Arduino and GSM to the Arduino Board for the main purpose of vehicle Tracking system In these the working of our propose system is like when any vehicle is parked far away from user then there are lot of chances of the vehicle get stolen .If thief is trying to start engine by the another way i.e using bypass way then the small amount of current will be passed by using the GSM system it can be texted to that registered user. By doing all of these is still vehicle got stolen then it may be possible to track the current position of that vehicle.

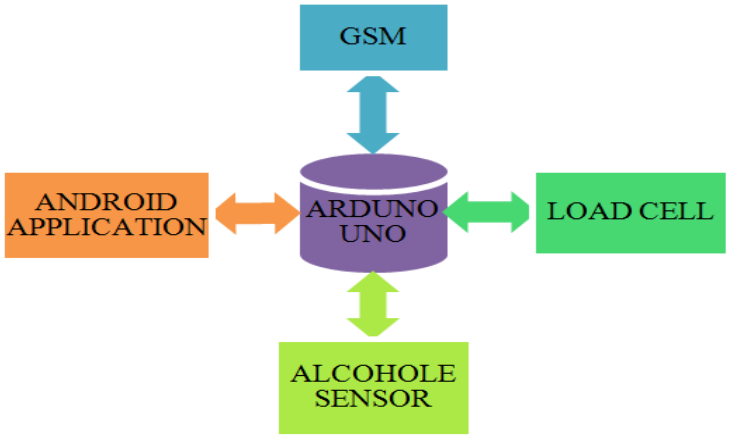


Fig. 1 Block diagram of implemented system.

Then here comes the another part of the load cell which we are using for the exact level measurement of fuel containing in that vehicle by these we can see result that in how much quantity of fuel the vehicle will travel. So by displaying the level it can display on dashboard nearest and working condition fuel station so that user can reach there very easily. The direction will display on any type of vehicles dashboard.

The third part of this concept is to fix the alcohol sensor on that vehicle. If any person drives a vehicle in drunken condition then there are full chances of accidents. To prevent these types of accident we are going to set the specific level of alcohol consumption if that person have consume alcohol above that level the by using small amount of current engine ignition will not work. It going to work only when the level of alcohol consumed of that person reach below the preset level.

A. Hardware Requirements

1) Arduino Uno Board
2) Alcohol sensor (MQ-135 GAS sensor)
3) Load Cell
4) GPS module
5) GSM (SIM900) Module
6) GSM (SIM900) Module

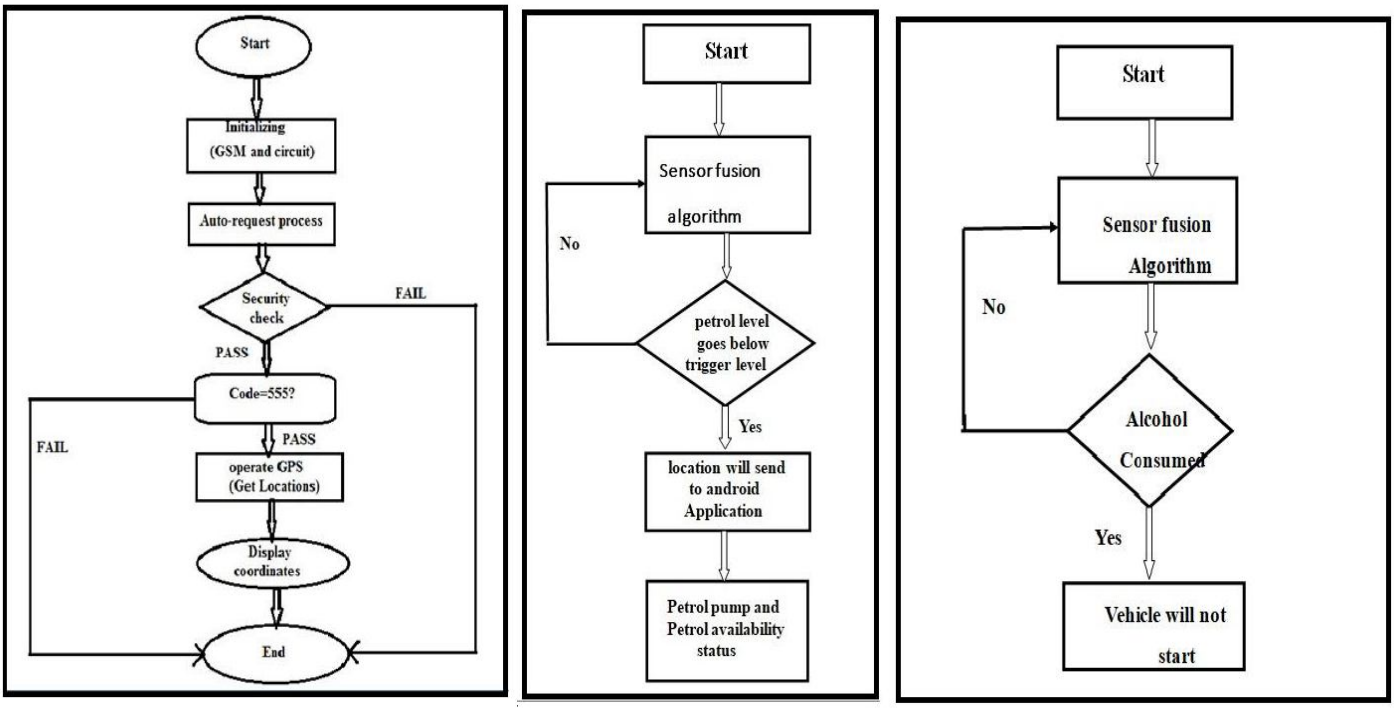
B. Software Requirements

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs -light on a sensor, a finger on a button, or a Twitter message -and turn it into an output -activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing. For Simulation we are using the Proteus8 Professional Software.

IV. METHODOLOGY AND ALGORITHMS

In the proposed system Arduino UNO is used which is a controller which controls the whole system. In this system alcohol sensor is used to sense alcohol is consumed by the driver and if alcohol is consumed by driver, alcohol sensor send signal to the Arduino UNO and vehicle will not start and otherwise vehicle will start. There is load cell is used to measure the exact quantity of fuel if there is low level of fuel it will send notification to the android application through GSM module. Hx711 is also used in the system which is A to D converter which is to connected load cell to the Arduino UNO.

In this system GPS and GSM module is used in which GPS module is used to track the location of vehicle and send the location of GSM to the android application of user.



A B C

Fig. 2 A. GSM Flow, B. Flow chart of Load cell C. Flow chart of Alcohol Detection Block diagram of implemented system.

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Sensor -fusion algorithm -Sensor fusion is combining of sensory data or data derived from disparate sources such that the resulting in formation has less uncertainty than would be possible when these sources were used individually. The term uncertainty reduction in this case can mean more accurate, more complete, or more dependable, or refer to the result of an emerging view, such as stereoscopic vision. It will combine the information received from the load cell.

petrol level comparison block –In this block it will compares the information about the petrol level to the preset level of the petrol .If the petrol level is above the preset level then it will goes back to previous block and if the petrol level is below the preset level then it will goes to next block.

After this if the petrol level is below the preset mark it will send a SMS on the android app and also shows the nearby petrol pumps and also checks whether fuel is available at that specific petrol pump or not.

V. PERFORMANCE ANALYSIS

Circuit diagram of "Advanced vehicle monitoring system" is shown in above fig. It consists of Arduino UNO, GPS module, GSM module, alcohol sensor and load cell. Arduino UNO is a controller which is the heart of our proposed system. As Arduino UNO is the heart of our system it controls the whole system and all components used in the system are connected to the Arduino UNO. GPS module has 4 terminals VCC, GND, TX and Rx which are connected to Arduino UNO as VCC of GPS module is connected to 5v of Arduino UNO. GND pin of GPS module is connected to GND of Arduino UNO. And Tx pin of GPS module is connected to any digital output pin of Arduino UNO. As same as GPS module, GSM module has also 4 terminals as VCC, GND, Tx and Rx which are connected to Arduino UNO as VCC to 5v, GND pin of GSM module to GND pin of Arduino. Tx and Rx pins of GSM module are connected to digital pins of Arduino UNO.

In this proposed system alcohol sensor is used to sense alcohol is consumed by the driver or not. And if alcohol is consumed by the driver it senses and vehicle would not start. Alcohol sensor has 4terminals which are as VCC, GND, Dout and Aout. Both VCC and GND terminals of alcohol sensor are connected to 5v and GND pins of Arduino UNO respectively. Dout pin of alcohol sensor is connected to the digital output pin of Arduino UNO and Aout pin of alcohol sensor is connected to analog pin of the Arduino UNO.

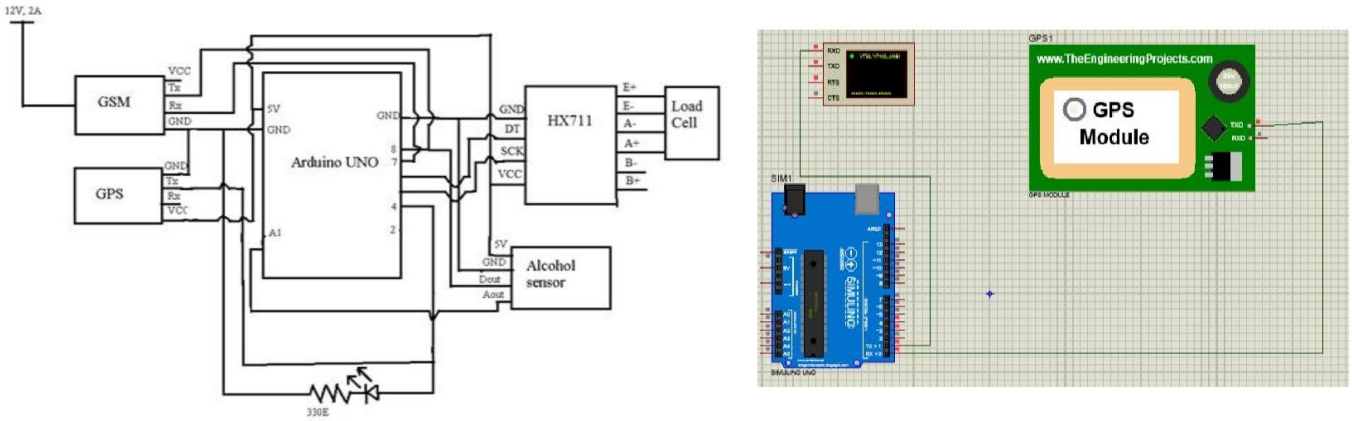

Fig. 3 Circuit diagram of implemented system and GPS interfacing

In the system load cell is used to measure the exact quantity of fuel. If there is fuel level is low then it will send notification on android application through GSM module. Load cell is also connected to Arduino UNO but there is Hx711 ADC is connected in between load cell and Arduino UNO. Hx711 has 6 output pins E+, E-, A-, A+, B-, B+. From which E+, E-, A+, A-pins are connected to the load cell. And it has 4 input pins GND, DT, SCK, VCC which are connected to Arduino UNO as VCC and GND pin are connected to VCC and GND pin of Arduino UNO. DT and SCK pins of Hx711 are connected to digital pins of Arduino UNO. The fig no. 3 shows the simulation of GPS module with Arduino UNO board. For the interfacing and simulation purpose we are using the Proteus 8 professional software.

In these simulation The Arduino Uno Receiver port to the GPS modules Transmission port. To observe the output of the GPS we can observe it on the Virtual terminal port as shown in fig. 3. In these the output in the form of Latitude & longitude but it not shows us the current position because we are simulating it. But we can copy that address and by using android application we can locate the current position of the system that we can simulating.

Fig. 4 Simulation of Alcohol sensor and Virtual Terminals of GPS

The fig no.4 shows the simulation of GPS module with Arduino Uno board. For the interfacing and simulation purpose we are using the Proteus 8 professional software. In these simulation The Arduino Uno Receiver port to the GPS modules Transmission port. To observe the output of the GPS we can observe it on the Virtual terminal port as shown in fig. 4.3. In these the output in the form of Latitude & longitude but it not shows us the current position because we are simulating it. But we can copy that address and by using android application we can locate the current position of the system that we can simulating. The fig. 4 also shows the simulation of the MQ-3 sensor with the Arduino Uno board with the help of interfacing the board we are giving the input binary 1 and o to check whether its detecting the gas or smell of alcohol (after Hardware implementation) or not. The algorithm for it is as follows.

VI. CONCLUSION

In this work the details about the system implemented for vehicle monitoring has been given. The details about the methodology and algorithm used for the implementation are also included in the presented work. The implemented system is advancement in vehicle monitoring. The simulation has been carried out and it is concluded that the system gives the perfect latitude and longitude position by using the GPS module. The system also gives the sensing output of the MQ-135 Gas sensor which is using for the Alcohol detection.

A. Advantages

1) Continuous Vehicle tracking is Possible Due to use of GPS.
2) Fuel detection is now easy because of using load cell. There is need to find fuel station because its shows on dashboard.
3) On dashboard Navigation is possible on any vehicle.
4) Due to Use of Alcohol sensor it can be easy to restrict drunken people to drive the vehicle as well as it decreases the cases which are occurred by “Drunk & Drive”.

B. Applications

1) In vehicle Theft Monitoring.
2) In fuel detection.
3) In fuel Theft Monitoring at fuel stations.
4) On Board Navigation System.

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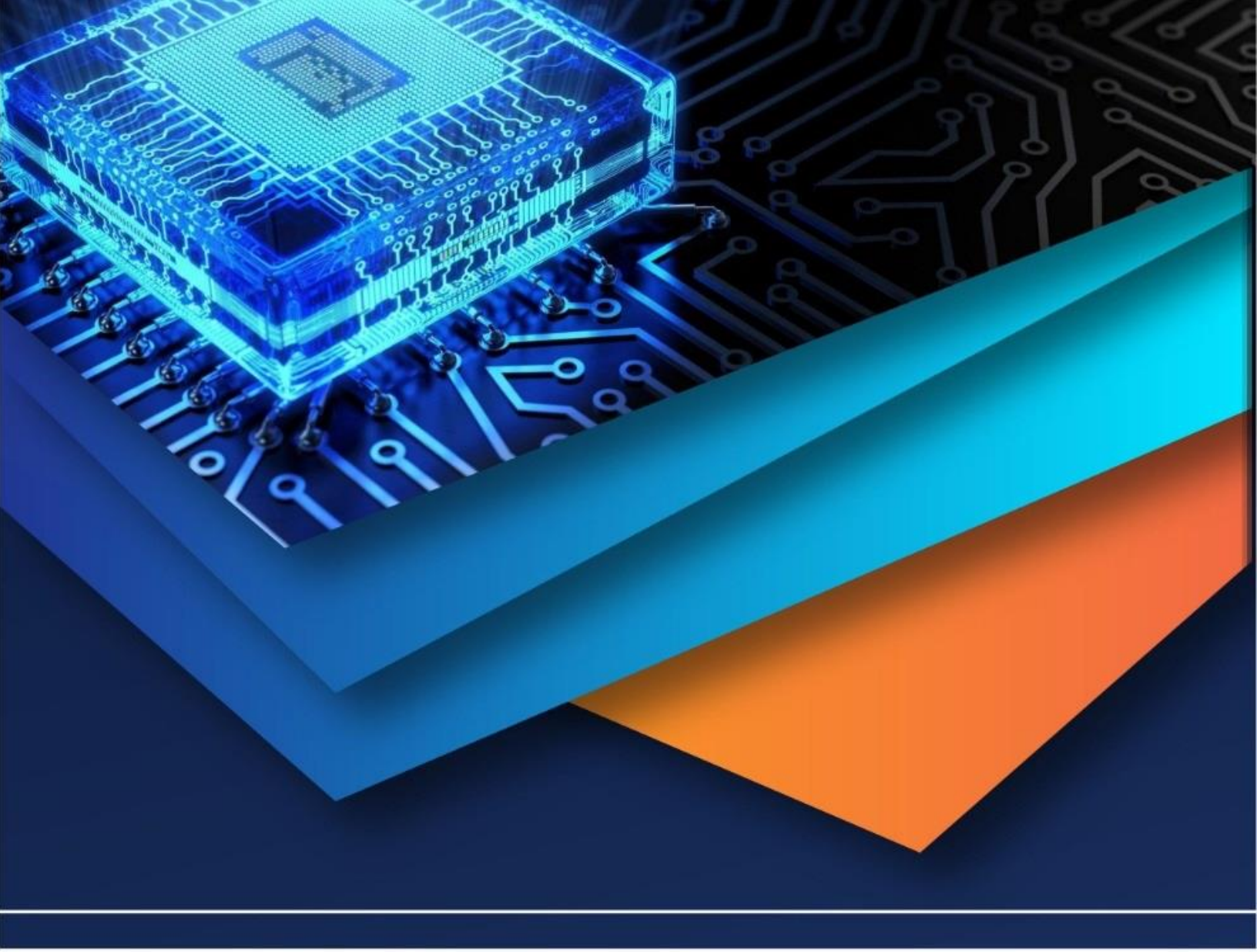

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