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VEHICLE TRACKING AND SECURITY USING IOT

Jwala Vasantrao Rathod

P.G. Student, Deogiri Institute of Engineering and Management Studies, Aurangabad, MH, India

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ABSTRACT: : Transportation is a must for today's life. It's make human life more easy and comfortable. Now days an accident ratio is increasing tremendously each and every day. Most of the vehicle are been theft, so we are going to introduce the system with the help of which the injured person can be traced by the exact location of vehicle provided by the sensor. In our proposed system we are going to introduce the technology to trace the exact location of the vehicle through sensors. If the vehicles are stolen then our system will track down the vehicles and gives us the coordinates and also sends a SMS to the owners and police. For preventing accidents different sensor are used such as alcohol sensor which will sense the driver is drunk or not, if the driver is drunk then the system will turn off the ignition and will give alert beeps and using WEB interface we can lock vehicle and incase if accident happens then the location of the vehicle is track as mentioned above and notification SMS is send to the nearby hospitals and the concerned person of their family. We also used heartbeat sensor to detect health of driver if found ill and will give alert beeps. These are all the features we are going to introduce into our proposed system.

Key words: *Adriano UNO, API, GPS, RFID, sensor (Alcohol, Accelerometer, PIR, Pulse Sensor)*

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I INTRODUCTION

In today's era, the number of automobiles has increased exponentially due to growth in the automobile industry. As the number of vehicle increases, the accident also increases. The reasons for most of the road accident are rash driving and hectic traffic.

The main aim of the system is to construct a control system that provides the complete control of the interface. The main aim of system is to provide an interface to send and receive SMS to provide coordinates for security purpose instead of being physically present at that place. The main aim of system is to build an advanced lock system for automobile. In these system the user send and receive the SMS through GSM module. When the user receive the SMS and if the message is validated by GSM module then the system send the latitude/longitude of that place but if it is found that the bike is theft then also the user receives the SMS and get the coordinates and the user can also turn OFF the ignition . General objectives of the project are defined as:-
a)To identify the co-ordinate of vehicle through Short Message Service (SMS).
b)   To confirm receive and transmit data via SMS.

c)   To eliminate the need of being physically present at any location for security purpose.

Accident notification system use SMS API and GPS, the main purpose of this project is to find the location of the accident in any place and send message through SMS API and GPS. SMS API technology is used for a mobile phone communication. PS is used to track the position of the automobile. Nowadays accidents are increasing at higher rate, this system provides to find accident location in remote areas and makes a hope in survival by providing the availability of ambulance or hospital as soon as possible. There are many other applications that can be used, such as the alcohol detection and the car theft.

II. RELATED WORK

From 1] the concept of RFID based accidental detection as well as the tracking of vehicle theft is referred. With the help of this paper the concept of RFID is properly understood. The proper functioning of RFID and interaction with microcontroller is studied better with it. All the algorithms related to RFID are studied effectively and the interaction of microcontroller and the automobile was properly interpreted which increased our interest in these system.

From 2] the Counting algorithms of RFID as well as all the RFID operation for tag matching are referred. Here the algorithm for interfacing the RFID with the microcontroller and the server was effective as well as the used algorithm was very well designed with lesser time complexity and system can trace the vehicle in fraction of seconds with this effective algorithm. This paper referred to many other algorithms but they were not much effective as like counting algorithm which is mentioned in [2] and due to its effectiveness it will be used in our proposed system. The overall functioning of our proposed system will be depending on this counting algorithm, so in our proposed system we try to boost up this existing algorithm for better output.

From 3] the communication between sensors and microcontrollers is studied and it also refers to the working principle of sensors. The sensors like ADXL, pressure, etc.,are interfaced with the microcontroller as well as the interfacing technique and the sensors are used at its fullest strength and also the drawbacks of sensors were given which helped in making better decision on which sensor to be selected for better output .This paper gave the best knowledge for functioning of sensors.

In 4] the use of RFID and the communication with the server is studied and it also focuses on the study and the use of messaging API (application program interface) for sending the messages and sending the coordinates. In our system server is used to save the emergency details of the person and the API is used for sending the messages. Thus this paper helped a lot for interfacing the server with RFID through microcontroller as well as it covered API and its message communication which we are going to used in our proposed system. We know proper RFID tag details are to be stored in server in order to properly match the tag with reader to provide proper authentication to its true owner, so paper [4] gave us the better knowledge to interface these system and make our proposed system effective for use.

From 5] the concept of microcontroller ARDUINO UNO, its operations and its programming is studied here. The ARDUINO is the heart of our proposed system. All the functioning of the sensors is based on the functioning of ARDUINO microcontroller; hence it is essential to study ARDUINO microcontroller, its operation and programming. In our proposed system the microcontroller controls all the functioning like tracking as well as sending of alerts messages. Thus paper [5] is very helpful as it covers ARDUINO microcontroller as well as it helps to achieve better system.

As per the above references we are going to introduce a system for accidental detection using RFID. In this proposed system the new concept is the alcohol sensing and sensing the moving creatures. With the help of alcohol sensors the drivers will be checked if he is drunk or not and If the driver is found drunk the vehicle will give an alert buzzer and will stop the ignition. To protect the vehicle from being theft we are placing PIR sensors which will detect the movement of creatures near the vehicle and if the creatures are detected the owner will get the emergency text and also the system will flash lights around the vehicle with the sound alert. Our proposed system will be beneficial on highways and out layers to provide emergency services as soon as possible which will save many human life'

III.PRPOSED SYSTEM

In our proposed system we are going to introduce the technology using RFID and Microcontroller ARDUINO UNO. The power supply is connected to our microcontroller, which connects all the sensors and records the data.
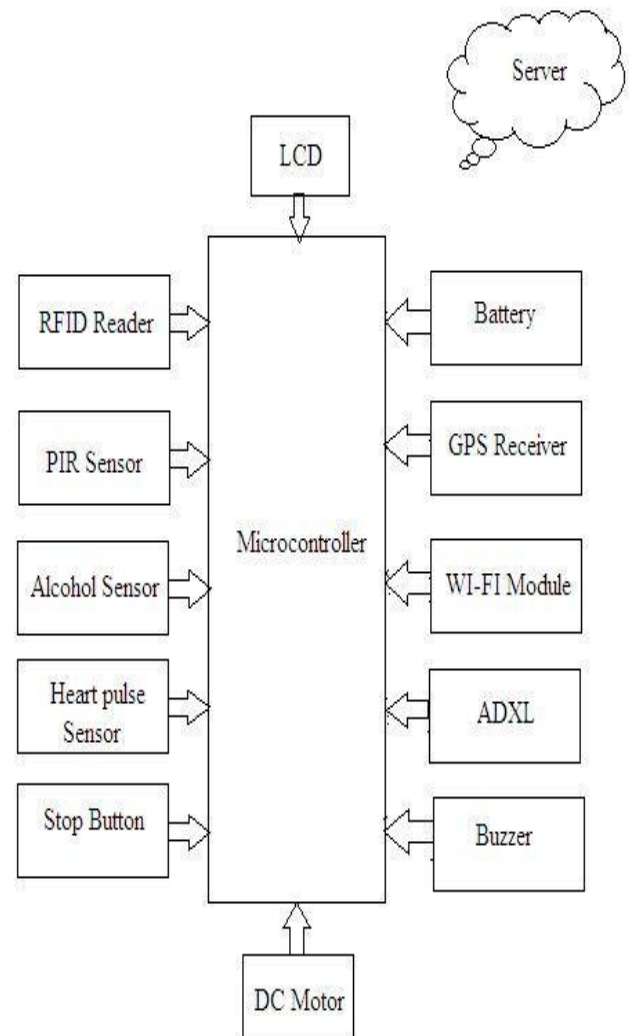

Figure 1: Accidental Detection

As seen in architecture we have power supply connected to ARDUINO. ARDUINO is connected to RFID, PIR, ADXL, LCD, GPS and ALCOHOL Sensor. The RFID reader is connected to ARDUINO and The RFID tag are

matched with reader for authenticating tag and the ignition of vehicle is done if the tag is valid. The GPS is used for tracking. The GPS sends the coordinates to GSM service and all the data are stored in the server. The PIR senses the presence of living thing near the vehicle and sends data to ARDUINO which will give the alert buzzer. All the emergency details are stored on the server and are accessed through internet in association with microcontroller.

Fig 2: Accident Detection System

A.ARDUINO UNO: It is a microcontroller development board made using ATmega328. ATmega328 has 14 digital IO pins 6 analog inputs. All the operations are done in association with ARDUINO. It performs all necessary operations.

B.POWER SUPPLY: A power supply is an electronic device that supplies electrical energy. Here ARDUINO Uno, sensor, GPS 5v DC supply.

C. Alcohol: The alcohol sensor is technically referred to as a MQ3 sensor which detects ethanol in the air. When a drunk person breathes near the sensor it detects the ethanol in his breathe and provides an output based on alcohol concentration. If it beyond threshold value we send message and stop ignition

D.GPS: Global Position System (GPS) is a navigating systemwhich is used to track down the vehicle in proposed system.

E.PIR: PIR is motion based sensor used to check the presence. If there is presence of any moving thing it will send the notification to user.

F: ACCELEROMETER: We are going to use the accelerometer for checking the tilt of vehicle angle and if the vehicle tilts by certain angle that is vehicle fells down it will send the notification to microcontroller.

G: Pulse Sensor: The heartbeat sensor is based on the principle of photo phlethysmography. It count the change in volume of blood through any organ of the body which causes a change in the light intensity through that organ. In case of applications where heart pulse rate monitored. If it goes beyond threshold value we will get alert beeps.

IV. PROCEEDING METHODOLOGY AND

DISCUSSIONS

We can say this system is not only efficient but also worthy to be implemented. Accident detection and antitheft technology can be fitted in automobile that can save someone life and also the emergency services like ambulance and police to determine the scene at the same instance. The GPS is used to take the coordinates and the GSM will send the SMS. Thus the emergency helpline can be able to determine the scene and take the immediate action. The GPS traces the coordinates and the SMS API will send the SMS to the contact and the sensors are used to measure physical values and if the threshold value is crossed the LED will display the accident location using GPS system.

Fig 3: Accident Detection.

Fig 4: Displaying Current Position.

Fig 5: Displaying Car Status.

Fig 6: Displaying Emergency Alert.

Fig 7: Displaying Emergency Alert.

Fig 8: Alcohol Detection.

V. SIMULATION RESULTS

In our proposed system we have tested the sensors for different parameter conditions and the result is so satisfying. All the sensor worked as per the expected outcome which is described in the below test cases.

Test cases:

RFID

Tag	Receiver	Ignition	Result
Authorized tag key	Tag match	ON	YES
Unauthorized tag key	Tag not matched	OFF and lock the car	YES

PIR

Moving Object sensed	Alert Buzzer	Result
Unauthorized Moving activity near vehicle	ON	YES
authorized Moving activity near vehicle	OFF	YES

ALCOHOL SENSOR
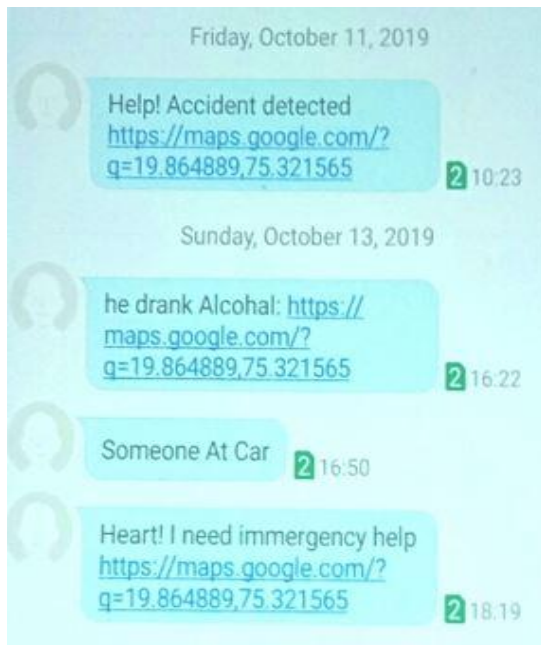
Fig 9: SMS Received

PULSE SENSOR

Heart Status	Alert Message	Alert Buzzer	Result
BPM Rate Crosses Permissible Range	Send To Emergency Contact	ON	YES
BPM Rate Under Permissible Range	Remains OFF	OFF	YES

GPS

Current Location	Track History	Accident Detected	Vehicle Theft	Action	Result
Stores current location	Update Track History	YES	NO	Send the current coordinates	YES
Stores current location	Update Track History	NO	YES	Send the current coordinates And Updated Track History	YES

LCD

Activities	Action	Result
Ignition Starts	Display Message	YES
Alcohol Detected	Display Message	YES
Moving Activity Detected	Display Message	YES

VI. CONCLUSION AND FUTURE WORK

The simulation outcome showed that the proposed algorithm performs better with the total transmission energy metric than the maximum number of hops metric. The proposed algorithm provides energy efficient way for data transmission and maximizes the lifetime of entire network. As the performance of the proposed algorithm is analyzed between two metrics in future with some modifications in design considerations the performance of the proposed algorithm can be compared with other energy efficient algorithm. We have used very less sensors, as number of sensors increases the complexity will increase. We can increase the number of sensors and analyze the performance. FThus we conclude that all the parameters worked successfully and as per different test case performed successfully defines the good performance of system with a high accuracy and stability.

VII. ACKNOWLEDGEMENT

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