

Vehicle Security System

N.Chandra Sekhar Reddy, M Srinivasa Rao, Raja Rajeswari Thota , Y.Harini Reddy



Abstract: Our project is designed to detect major and minor accidents. These accidents are detected and notified to the driver's emergency contact and to emergency service center like hospitals, police station, regarding the location and information of the driver. An SMS is sent in order to notify the emergency contacts. This system uses theft control mechanism for its implementation. The system is provided with an emergency switch to control the engine after the password is received from the owner of the automobile. This system is interfaced with vehicle air bag mechanism for security purposes. In case of vehicle theft situations, owner can know the vehicle's current location and the vehicle can be stopped by sending a predefined SMS to the system. After receiving the SMS, ignition is turned off automatically by the system.

Keywords—IOT, Android Mobile Phone, Micro Controller

I. INTRODUCTION

This project is designed to solve the problem regarding accidents and theft control which is often happening now a days. Using this project we are providing a smart solution to this problem. By using some IOT intelligence we can get rid of all these type of accidents . Using this project, we could really solve a very serious problem.

Recent study of information gathered through survey explained the increase in number of accidents mainly due to rash driving and heavy traffic. When these incidents take place, often the victim's families are not aware. So, to over these types of problems we have designed this product in a way to notify the driver's current location through message when an accident takes place. This project also implements a theft control using ignition control system that can be operated using the owner's mobile. In this project we are providing a solution for accident cases and theft control.



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II. LITERATURE SURVEY

A. Existing System

This project provides security to the vehicle using a new technology to unlock the door of the car as well as wearing of seat belt.

The existing system includes only the GPS and GSM modules to detect and notify the driver's current location. These modules are deployed in the interior of the automobiles. Hence, if the driver drives the vehicle on the wrong path then the alert message will be sent from this system to the vehicle owner's mobile. The existing system just monitors the vehicle and then alerts the owner about the status of the vehicle. This system even cares about the travelers safety.

B. Disadvantages of Existing System

Emergency medical services , fire department or family members may not know the exact location of occurrence of accident. It may take time to reach the location. It is difficult to find the location of the vehicle and we cannot even control if it is stolen by others. We cannot control the theft cases.



III. PROPOSED SYSTEM

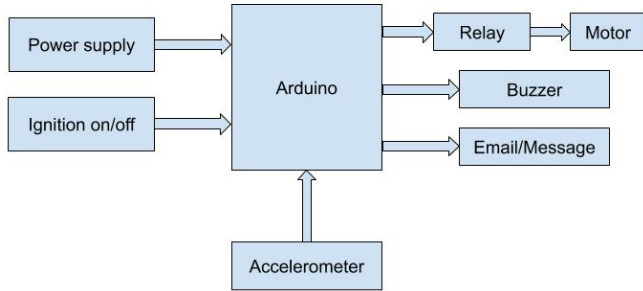
An advanced vehicle security system is proposed for the purpose of monitoring the vehicles which are moving from one place to the other in order to provide safety and security. The proposed system includes theft control and accident notification systems .By proposing theft control system the owner can monitor the vehicle and then control the vehicle using ignition system. The owner also gets the notifications regarding the accident of the vehicle, so that the owner gets alerted by the alert message. The proposed system cares about both the vehicle and the traveler's safety.



A. Advantages of Proposed System

The vehicle gone through with accident can tracked easily and can be easily notified to the user's guardians, ambulance and police station. So that the person gets a quick help from these sources compared to previous situations. In theft control situations the person can easily track the vehicle and then can control it from the mobile using a message which is used to stop the vehicle.

IV. SYSTEM DESIGN



The above block diagram explains about the working of vehicle security system which describes about the accident cases and theft control cases. In the above fig 4.1, Accelerometer, Ignition motor and Power supply are the inputs to the Arduino and Relay, Motor, Buzzer and Email/Message are the outputs from the Arduino. The accelerometer is used to detect the accident in x, y, z angles and then sends the output through Arduino in the form of email or a message to the user's family, ambulance, police station. The ignition control motor is used to control the vehicle in theft case situations. The ignition on/off button is used to control the motor through Arduino to relay which the motor is directly connected to. The motor can be controlled through user's mobile by sending a predefined message to motor. The motor gets automatically switched off after sending a message. By sending the vehicle will not function any more. So by using these accelerometer and ignition control motor we can reduce the theft cases and provide the treatment quickly to the victims.

Components

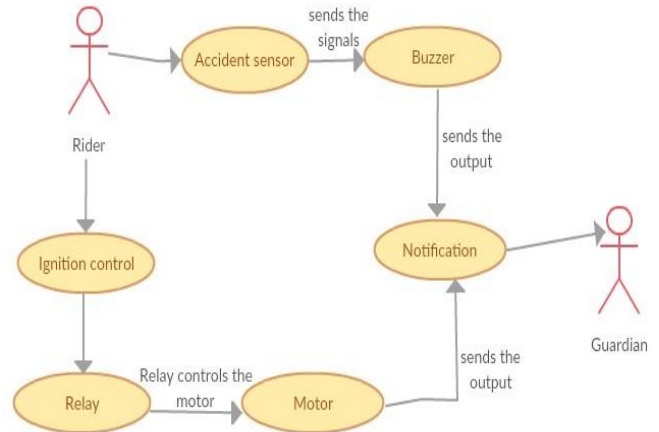
Hardware

- ✚ Arduino UNO
- ✚ Relay
- ✚ Buzzer
- ✚ Ignition Control
- ✚ Accelerometer
- ✚ Power Supply
- ✚ Motor
- ✚ GSM module
- ✚ GPS
- ✚ Phone
- ✚ Connecting wires
- ✚ Male headers

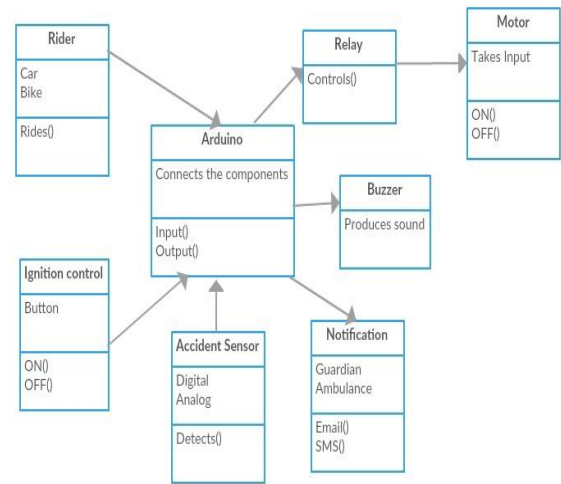
Software

- ✚ Arduino IDE

V. DATA FLOW DIAGRAMS

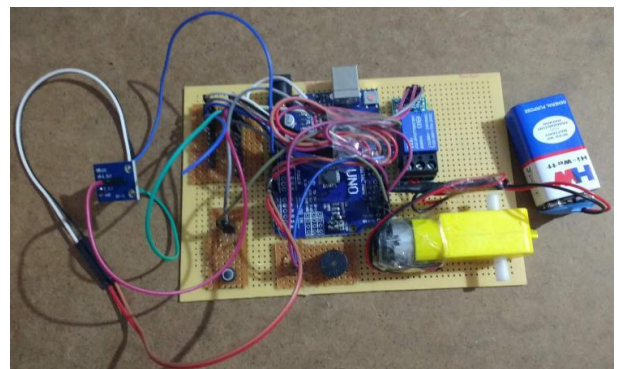


A use case diagram is used to depict the number of users and use cases in a system design including the functionalities of it. The figure attached above shows the use case diagram vehicle security system that we designed to control the accidents and theft of the vehicles.

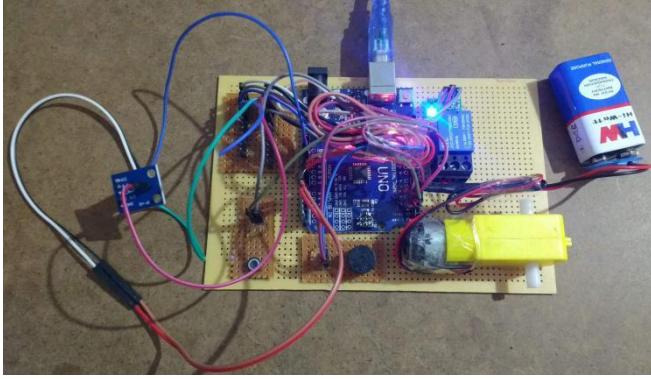


This diagram gives a brief description of our project in terms of classes and objects for easy understanding of the mechanism of our project's design. It gives an overview of the target system, the objects and classes and also the relationship among them to let us understand clearly regarding the system's design and implementation.

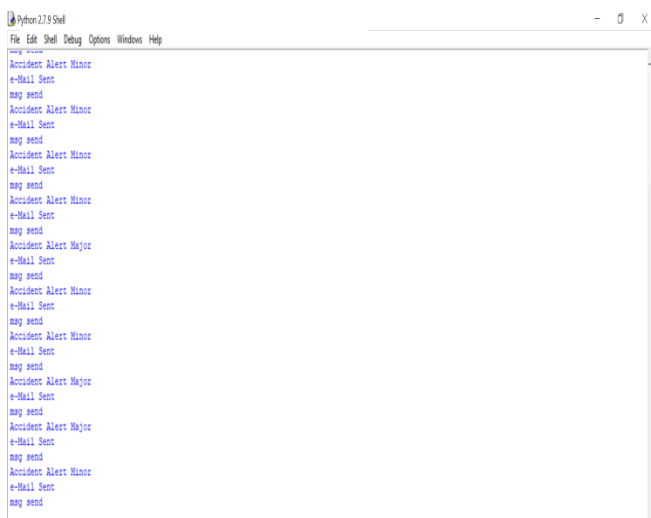
VI. WORKING PROTOTYPE



The above screenshot is the prototype of the whole project vehicle security system.

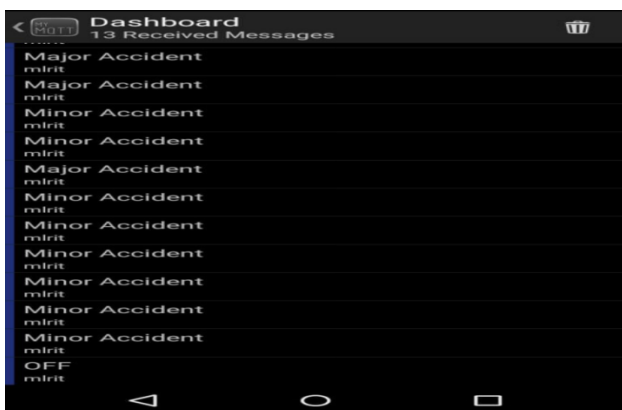


The above screenshot depicts the working mode of the project in which the prototype is connected using a USB cable in order to get the output.

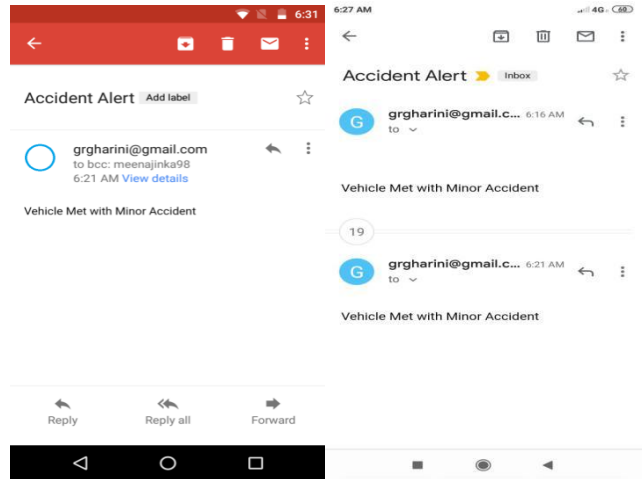


The above screenshot shows the outputs such as ‘Accident Alert Minor’ and ‘Accident Alert Major’ which are obtained for different cases when there is minor accident and when there is a major accident and when the motor is in OFF mode.

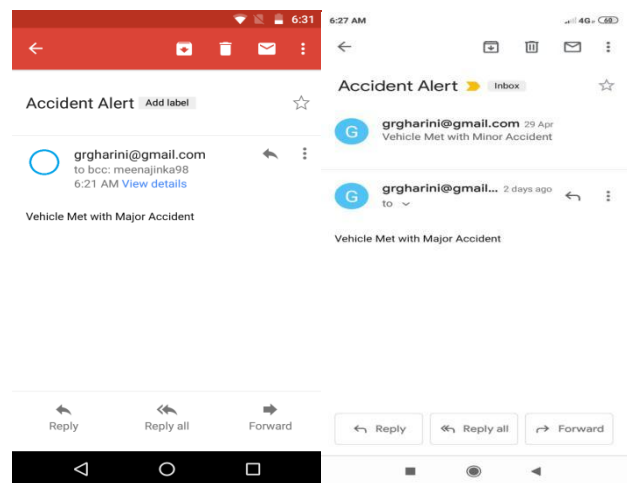
VII. RESULT



The above screenshot shows the publish-subscribe messages. These messages are received when the client is connected to the broker.



The screenshot represent the email notification of minor accident which is automatically sent from the user's mail to the others mail when a minor accident occurs.



The screenshot represent the email notification of major accident which is automatically sent from the user's mail to the others mail when a major accident occurs.

Table No.1 Table For Accident Alerts

S.No	Minor Accident	Major Accident	SMS Alert	E-Mail Alert
1	Yes	No	Yes	Yes
2	No	Yes	Yes	Yes
3	Yes	No	Yes	Yes
4	Yes	No	Yes	Yes
5	Yes	No	Yes	Yes
6	No	Yes	Yes	Yes
7	No	Yes	Yes	Yes
8	Yes	No	Yes	Yes
9	Yes	No	Yes	Yes
10	Yes	No	Yes	Yes

Vehicle Security System

The above table represents the type of accident occurred and indicates sms and e-mail alerts sends from User's mobile to others such as Police station and ambulance for early services.

$$\begin{aligned} \text{True Positivity Rate} &= \frac{\text{Number Of Accidents Correctly identified}}{\text{Total Number Of Accidents}} = 80\% \\ \text{False Positivity Rate} &= \frac{\text{Number Of Accidents Wrongly identified}}{\text{Total Number Of Accidents}} = 20\% \end{aligned}$$

Here, The above formula indicates positivity Rate of accidents. From the above results we identified True positivity Rate is very high.

VIII. CONCLUSION

The ongoing research in the field of IOT and its implementation in full or partial manner will improve the quality of life. Thus, the proposed system "Vehicle Security System" would take the security level a step forward and try to cover the many of loopholes which are in existing technology, the verification shows that the IOT based Vehicle Security System is realistic and can control the theft automatically. The response time delay is also less. This IOT based Vehicle Security System enables the user safety by seat belt compulsion and air bag compulsion. Above all these, it gives security to the vehicles from thefts. It is an ideal solution for all the vehicle users.

ACKNOWLEDGEMENT

Based on the research and analysis we had developed this product to help the society in controlling the accidents that are taking place due to rash driving and traffic and also to control the theft for vehicles. We thank everyone for providing this platform to implement our project and bring it into life. We look forward to upgrade this and provide a cost effective product in society for each and everyone to use this in order to protect their vehicle and keep the people updated about their things, vehicles and gadgets.

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