Intelligent Accident Detection System and Emergency Services Alert System

Tejas Chopda[1], Sumit Gotpagar[2], Sarthak Kale[3], Vividha Ashtekar[4]
Students, Department of Computer Engineering
Faculty, Department of Computer Engineering
NBN Sinhgad School of Engineering, Pune, Maharashtra, India

Abstract: *In past few years the rate of accidents are increasing day by day and many people die in this accidents due to late treatments, so our paper works to solve this issue in our life. By our paper we could save many lives and save many loved once happiness that they deserve in their life. Also our paper also work on the issue many insurance companies faces that some time they cannot tell or determine that what was the time and date of the accident because they just need the date n time to proceed their pending insurance claims. Our paper will help them to get the exact information about the collusion.*

Keywords: Intelligent Accident Detection System

I. INTRODUCTION

In the previous few years the numbers of accidents occur on the roads are getting higher and higher. Because of this the number of Casualties increases in higher numbers simultaneously. To prevent this, our paper works on a system which could detect the accident impact and contact the emergency services, so the precious lives of the injured person could be saved. Also, we are providing contacts with friends/ families and insurance companies. This results in the families of passengers and drivers getting notified about the accident. The insurance companies also get informed, so they could act fast to provide insurance to the person in need. We send alert messages to the nearest emergency services about the accident. Hence, the accident spot can be located usingGPS module.

Automobile is a highly growing industry which happens due to high demand of the vehicle. In every family of India, if we roughly assume that there are around 4 people then almost each person have its own vehicle which forms a ratio of 1:1 which is a lot compare to the population of India. This increasing demand of vehicle results in more traffic on the roads which could result in increase in the number of accidents occurs on roads which are fatal many times

II. TECHNICAL SYSTEM

So for our system we are going to use some technical hardware part and some software part. It will be an embedded system whose work will be to detect the impact and send it to the emergency services and families. This system will work as below.

For our system we have to 1st select a sensor which could detect whether the impact is accrue or not and for this we studied some different types of sensors such as impact sensors, vibration sensors, pressure sensor, shock sensor, etc. By this study we have decided that the best sensor for our system would be vibration sensor or pressure sensor. These sensors could provide us with needed important information we need after and during impact. After sensors we studied about the microcontrollers which would be more compatible with our sensors.

We also read some papers on this topic that could help us and in those papers we learn that there are some similar system already exist which uses accelerometer to detect the impact on the vehicle by using the sudden drop in speed. This is a good way to detect the impact but it is not so accurate. Also we learn that this system does not rovide some other emergency contacts such as friends/families contact, insurance companies contact.

Also we are going to prove a web application and a mobile app which will help the user to fill up his and his car details so it will help him at the time of accidents. Main work of the app will be to generate a account of the user here all his details such as name, age, medical background, insurance, etc. And also the car details such as car owner, number, model, previous history of car, car insurance, etc..

Copyright to IJARSCT
www.ijarsct.co.in

DOI: 10.48175/IJARSCT-11266

404

ISSN
2581-9429
IJARSCT

III. LITERATURE SURVEY

In the refer papers the system they used is not the simple that much and the systems are more costly also. The response time is low which might cause systems for late message transmitting. Other systems don't cover more points. Our system provides results with more accuracy and our system can work with more points than them. Our system also rembers the driver for maintaining safe distance during driving or surfing.These points makes our system better.

.In 2015, a group of students designs a system that detects the impact to the vehicle and provides dial pad to enter the emergency contact. In this system the Bluetooth connection of android phone needs to turn on for receiving pressure sensor data. After that, the application takes an emergency number to send message immediately after detecting accident. Then the application retrieves the speed value at the screen with the help of GPS. Here, speed shows at mile per hour unit.

One potential disadvantage of this system is that after accident the driver or someone else have to open the mobile phone and dial the emergency number manually to contact the services or even family members, which is not possible in some worst cases where the person is not able to dial the contact.

This system totally depends on the conscious user and if the user is unconscious then the system is not very useful. [1].

In 2016, A system was created which works on the principle of vibration sensor which detects the accident to the vehicle by sensing the vibration occurring due to the accident. This output is given to MCP 3208 which converts the analog form into digital. This digital output is checked with the threshold value. If the value exceeds the threshold, GSM is activated. The corresponding key is pressed on the keypad to select the phone number stored in EEPROM. AT2408 acts as the storage device for the phone numbers. An SMS alert is sent to the selected number using GSM (SIM 300).

However, the problem from the previous system carries same with this one too. It also has the same problem of dialling the contacts manually after the accident occurred. Overall this system is better than the previous system with some small improvements. [2].

In 2018, A new system is introduced where the user does not need to enter the contacts manually by hand. In this system if the vehicle gets any head-on collision the vibrations are produced. If the vibrations exceed a threshold value they are detected. The central processing unit in the system will sense that accident has occurred. Similarly, if the vehicle doesn't collide but topples or tilts by any large angle the system will detect the accident from the gyro sensor. The system will wait for 10 seconds. If reset button is pressed by the driver within 10 seconds the system considers that accident is not serious and it resets back to normal operation

. In both the cases if the reset button is not pressed it will be treated as serious accident. The heart rate sensor will detect the heart rate of the driver, the current location will be collected from the GPS module and SMS will be sent to emergency contacts. The system also locates nearby hospital and police station and message will be sent along with the vehicle information. The heart rate sensor will detect the heart rate of the driver only when the accident has occurred. By sending the heart rate information, the hospitals will get to know about the condition of the driver and accordingly they can react to help the driver

Overall, This system works much better than the previous systems but still it lacks some things which would be useful for the driver and passengers. If the accident is occurred at the night time then it will send the notification to the services but may not any help from the nearby peoples due to darkness in the surrounding. [3].

In 2020, a upgraded system was designed. In this system Arduino is used with GPS Receiver and GSM module to control the entire process. GPS Receiver helps in detecting the coordinates of the vehicle. The detected coordinates are then sent to the rescue team via SMS using the GSM module. The accelerometer ADXL335 is used in any axis to detect accidents or sudden changes. It displays coordinates or status messages via LED. The Arduino then read the changed values and compares with the predefined values in order to identify the axis change. If there is a change in the axis values then Arduino read coordinates from GPS module records and informs the rescue team with accident location by sending SMS. This way the affected person can be rescued by the rescue team with in the minimum time and can be provided with the required medical support.

However, in this system it does not send any message to the family or others about the accident. It only contacts the emergency services and no one eles.[4].
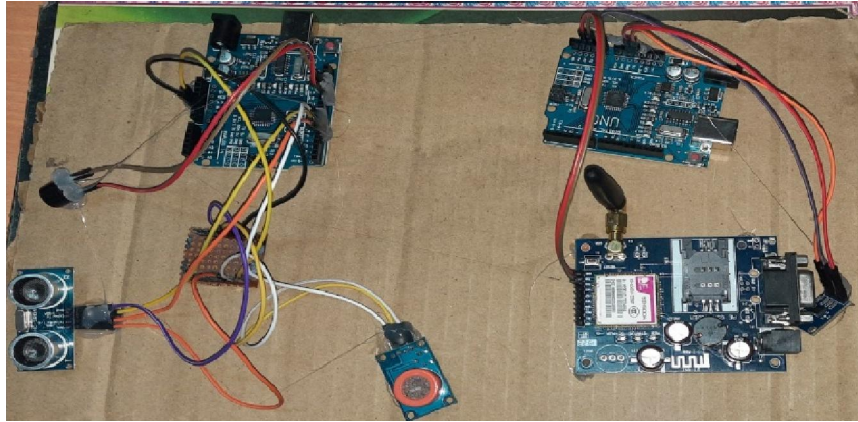
IV. HARDWARE

Fig1: Hardware of implemented system
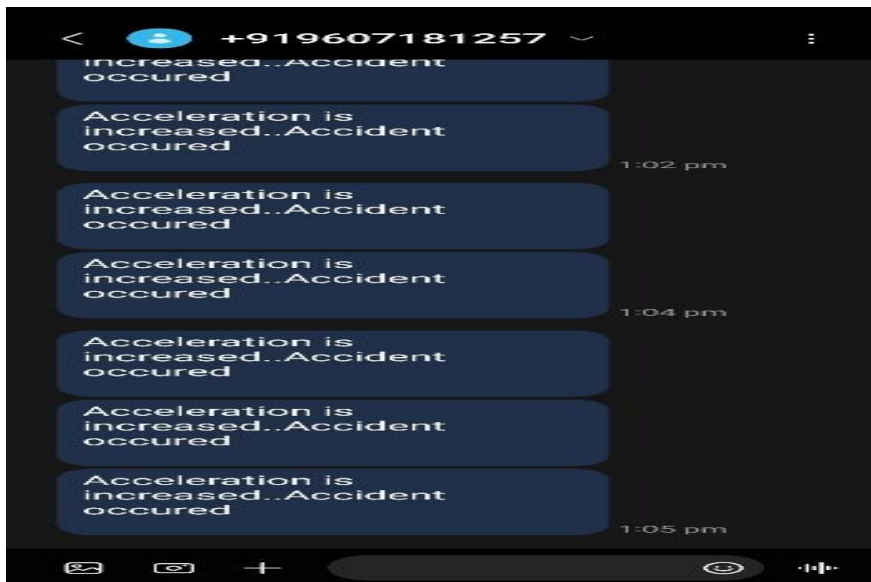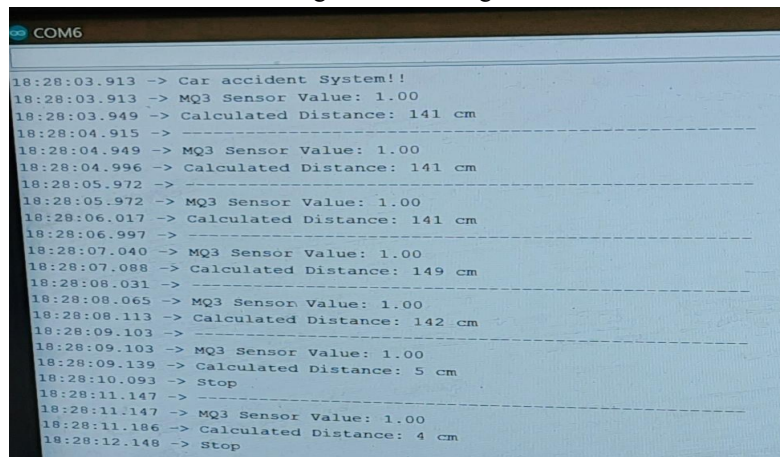
V. RESULTS

Fig2: Send message

Fig3: Safe distance warning

VI. CONCLUSION

By all the survey we can conclude that the numbers of accidents are increasing every day and due to this the numbers of casualties are also increasing. This happens due to slow or no medical assistance at the spot at the right time. So to prevent these casualties our system could help the accidental peoples.

REFERENCES

[1].Adnan Bin Faiz, Ahmed Imteaj, MahfuzulhoqChowdhury "Smart Vehicle Accident Detection and Alarming System Using a Smartphone".

[2].D.BinduTushara, Dr.P.A.HarshaVardhini "Wireless Vehicle Alert and Collision Prevention System Design using Atmel Microcontroller".

[3].Nagarjuna R Vatti, PrasannaLakshmiVatti, RambabuVatti, ChandrashekharGarde" Smart Road Accident Detection and communication System".

[4].NaziaParveen, Ashif Ali, Aleem Ali "IOT Based Automatic Vehicle Accident Alert System"