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Automatic Vehicle Accident Detection System Based on ARM &GPS

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Abstract- The Rapid growth of technology and infrastructure has made our lives more easy. The advent of technology has also increased the traffic hazards and the road accident take place frequently which causes huge loss of life and property because of the poor emergency facilities. Our project will provide an optimum solution to this draw back by using an MEMS sensor, GPS & GSM.

Keywords- Vibration detection, GPS, GSM, MEMS, ARM, Emergency call system

I. Introduction

The system detects the vehicle accident with the help of vibration sensor or MEMS sensor. GPS module captured the location of vehicle accident and a inform message is transmitted which contains the co-ordinates value with the help of GSM modem. To provide very fast medical treatment to the victim of vehicle accident. It also sends a message to police control room with the location of accident to minimise the time required for legal police process, and a victim can get fast treatment. It also provide facility to refuse the medical treatment if victim is not badly injured to save the valuable time of medical rescue team. One more facility is provided that in a case when a person need medical treatment not for the accident case but for other reason like having heart attack problem at that time a message is transmitted to the medical help centre by just pressing a single switch.



Fig. 1 Need of the system



Fig. 2 Block diagram of system

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The main objective of this project is to detect the vehicle accident and transmit the location of the accident with the information of victim and type of accident to the medical help centre and police controm room. So medical help centre and police control room will get the exact location by the geographical co-ordinates transmitted via message with the help of map.

III. Schematic Diagram

After knowing the exact location medical help centre will inform the medical rescue team which is near to the location of accident in very short time. So the main objective of the project is to minimize the time gap between the occurrence of accident and the time required for medical help centre to reach at the location of accident to give treatment to the victim.

IV. Working of the system

This system designs the scene of the accident alarm system based on ARM and GPS. When the accident occurred, the manual and automatic alarm can be realized. Vehicles state and user information as well as alarm locations will be transmitted to the Pre-set of treatment centre; after receiving related alarming information, the treatment centre will display this information on its map. after receiving alarm information, the treatment centre staffs who are on duty will notice the handler who is the nearest to the scene of the accident in time, in order to reach the scene of accident in the first time, and gain more treatment time for the accident injured, and lower the accident mortality, as well as reduce incidents impacting time on the traffic.

In this project when a car met an accident, at that time the accident will be detected by the vibration sensor or accelerometer. An accelerometer can be used in a car alarm application so that dangerous driving can be detected. It can be used as a crash or rollover detector of the vehicle during and after a crash. With signals from an accelerometer, a severe accident can be recognized. According to this project when a vehicle meets with an accident immediately Vibration sensor will detect the signal or if a car rolls over, a Micro electro mechanical system (MEMS) sensor will detects the signal and sends it to ARM controller.

Immediately microcontroller sends the signal to GPS module to give the exact value of the geographical co-ordinates which contains the value of longitude, latitude and altitude. After that the microcontroller sends the alert message through the GSM MODEM including the co-ordinates value of GPS to the medical rescue team and a police control room. Then the medical help centre will conform the location of the accident by analysing the co-ordinates value of GPS on a map. Once the medical help centre get the location of accident, it

will inform the medical rescue team which in near to the location of the accident so that the victim can get the treatment as fast as possible. Also our system will send the message to the police control room so that their the required investigation can be done in very less time and the medical rescue team



Fig.3 Schematic Diagram

is allowed to provide the treatment to the victim.

If the person meets with a small accident or if there is no serious threat to anyone's life, then the alert message can be terminated by the driver by a switch provided in order to avoid wasting the valuable time of the medical rescue team. For that when medical help centre gets the first message regarding the accident, it will send a replay that do you need a medical treatment. Then if a victim is having minor injuries and do not want a treatment then he can refuse the treatment by pressing a switch which sends the signal to the help centre that there is no need of treatment. But if victim is badly injured and unable to send any kind of feedback then medical help centre will wait for 2-5 minutes, if there is no feedback then it is assumed that a victim is badly injured and medical rescue team will be send as fast as possible.

One more facility is also provided which can be very handy during the critical times. If a person requires help not after the accident but for other reasons like having symptoms of heart attack. At that time all he have to do is to press a single switch provided in the system. By pressing this switch a message is transmitted by the GSM module to the help centre which contains the location of car provided by GPS with the information of the user. And the medical rescue team will reach to this location as fast as possible.

V. Scene of System



Fig. 4 Scene of System

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VI. Result Window



Fig. 5 Notification of Front accident



Fig. 6 Notifiction of Left accident

VII. Limitation

Existing system do not work if the system itself damaged in the vehicle accident Also this system is not very effective in case of accident of heavy vehicles.

VIII. Future Enhancement

There is a scope for improvement and as a future implementation we can add a wireless webcam for capturing the images which will help in providing driver's assistance.

IX Conclusion

This system can shorten the alarm time greatly and locate the accident spot accurately, realizing the automation of accident detection and information transmission. Consequently, it will save the rescuers form wasting their time in search. The experiments of model car's collision and rollover proved that this system can automatically detect corresponding accident and sent related information. Such functions can be achieved by buttons representing "false alarm", "help" and "safety", respectively.

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