Rural Area Accident Detection and Information System

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Abstract:
People are very fast in the time of science now and they do not care about anything. Even though, if any accident occurs no one cares about it. Recent reports by WHO indicate: India having the highest number of fatal accident. Due to carelessness on roads leads to accident and increase in death rate and some of the accidents happened are not identified by the nearest people, ambulance services, highway patrol. These deaths are happened because of no prior information is given about the exact location, where the accident taken place at the right time. This is an intention to implement an innovative solution for this problem by developing an Accident detection System using Arduino and FSR. This system has been developed and implemented using FSR can merge accident related data. if accident occurs, this emergency alert information including the location, speed of the vehicle, Registration number of vehicle is transferred to the nearest police station, ambulance service ,nearest highway patrol and relatives through internet.

Keywords: Arduino, FSR, GSM, GPS.

I. INTRODUCTION

Now-a-days lot of accidents happen on highways due to increase in traffic and also due to rash driving of the drivers. And in many situations the family members or the ambulance and police authority is not informed in time. These results in delaying the help reached to the person suffered due to an accident. An accident is a specific, identifiable, unexpected, unusual and unintended external event which occurs in a particular time and place, without apparent or deliberate cause but with marked effects, it implies a generally negative probabistic outcome which may have been avoided or prevented circumstances leading up to the accident been recognized, and acted upon, prior to its occurrence. The Accident detection and information system using Arduino is very sufficient and worthy to implemented in the vehicle specially in developing countries like India, Nepal etc. The Accident detection and information using Arduino prevent the uncertain death after accident because in this system send the message alert to the hospital or police station. The model proposed in this paper tries to utilize the data available through database by extracting factual and relevant information..

Figure.1. Vehicle collision

If an accident happened in urban areas can be easily identified by the people and the accident information is passed to the

ambulance services within a minutes, but an accident happened on rural areas are not identified by anyone. Most of the accidents are happened on Highways during the night time are not identified and morning only it will be identified and then only the information will be passed to ambulance services. So most of the lives were killed due to less awareness. In this project, we have an innovative idea to implement a solution for this problem by using our Internet of things(IOT) based accident detection and information system And it will definitely will save many people lives.

II. LITERATURE REVIEW

The Objective of the Research in any projects is to analyse the core concepts. Merits and demerits of the technologies used in the project. In Recent years, accidents are increasing day by day due to violation of rules while driving. Several projects and technologies are brought up to control the road accidents. Some of the project systems which are developed and published for the safey of the drivers are listed below:[1] proposed a system called INTELLIGENT ACCIDENT DETECTION AND ALERT SYSTEM FOR EMERGING MEDICAL ASSISTANCE to develop a safety for drivers. The main of this system is to alert the nearby medical centre about the accident to provide immediate medical service. The process involved in this system is as follows.1)The Accelerometer is attached to the vehicle to sense the tilt of the vehicle and the heartbeat sensor in driver's body senses the abnormality of heartbeat.2)The system sends an information to Accelerometer and Heartbeat sensor through Bluetooth and it is connected to an Android Application.3)Finally the information is sent to the nearby hospital. To reduce the fatalities occuring in road accidents, Hossam M.Sherif [2] proposed a system using Wireless Sensor Network(WSN) and RFID technologies. The Goal of this accident detection system is 1)Sensors intalled in a vehicle detects the accident's location 2)To detect the vehicle's speed 3)Number of passengers in a vehicle. Some of the systems use different methods to enhance the accident detection in an advanced

manner such as In Jungle[3] proposed a system which includes detection of accident through CCTV and Cabgero Moser system[3].The aim of this system[3] is 1) to overcome shadow and night time 2)to detect accurate location of the accident 3)to find a vehicle trace. In addition to this, Zu Hui [4] proposed a traffic accident detection system which is intend to extract background and foreground from video shots.[4] uses an advanced technique called Gaussian Mixture Model(GMM) to detect vehicles. Prasanmit Nath[5] has proposed accident intimation system using IMU, which indicates the delay in Emergency medical services(EMS). Bankar Sanket Anil [6] and others have presented a paper on accident detection and reducing the fatalities of road accidents. Hence from the analysis of above proposed systems, we introduced a method of detection of the location of the accident using GS module and detection of the vehicle's speed when the vehicle hits using Force Sensing Resistor(FSR).

III. ACCIDENT DETECTION AND INFORMATION SYSTEM

The target of our project Rural area accident Detection and Information system is to give information like location of the vehicle, Speed, Registration number, Passenger details by the use of vehicle registration number to Ambulance service, Nearest Highway Patrol, Police and Frequently contacted person from the victims mobile number. This project is having both transmitting unit and the receiving unit, The circuit which is fitted on the vehicle is called transmitting unit, The server of the ambulance services, mobile number of relatives, nearest police station number were called as receiving unit.
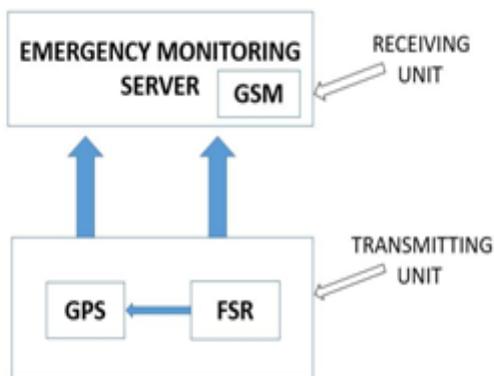

Figure.2. Circuit Diagram

IV. THE COMPONENTS USED IN THE PROPOSED SYSTEM

1. FSR(Force Sensitive Resistor)
2. GPS
3. GSM
4. Arduino Board
5. Power Supply
6. Connecting Wires

FSR(Force Sensitive Resistor)
The FSR which can be fitted in the transmitting unit(vehicle),which detects the accident and sends the signal from FSR to the Arduino board which is also in the transmitting unit.

GPS
The GPS detects the location of the accident and sends the location information in the form of longitude and latitude to the Arduino board

GSM
The GSM Module which is placed at the receiving unit and receives the accident information from GPS and cloud server at the emergency monitoring server in the Ambulance Station. GSM also sends the information to cell phones of relatives from the cloud server.

ARDUINO BOARD
The Detection information is sends to the Arduino board from FSR,At this time, the Arduino takes control and start collecting the location information from GPS
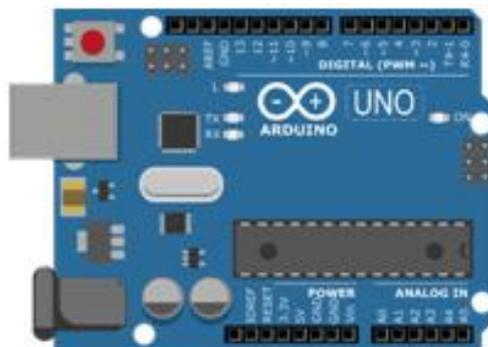

Figure.3. Arduino Board

POWER SUPPLY

The power supply can be given to the transmitting unit from the battery of the vehicle. The receiving unit which is placed at emergency monitoring server in the ambulance station does not need any extra power supply, because they are already plugged in to the power supply.

CONNECTING WIRES
Both in the transmitting and the receiving unit, There is a lot of wire connections between Arduino, GPS, and in the GSM Which is in the Receiving unit.

Figure.4. System Architecture

V. CONCLUSION

This paper presents the rural area accident detection and information system provides location, speed of the vehicle, vehicle numbers to the nearest police station, patrol and ambulance services. By the use of these prior information, police and ambulance service can easlily get access to know the exact location and save many people lives.

VI. REFERENCES

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