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IOT BASED ACCIDENTAL DETECTION SYSTEM

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ABSTRACT

IoT (Internet of things), is one of the most growing technology in IT industries and is used to decrease the burden of human beings. With the help of IoT we are creating a solution for the accident cases where the identity of the victim remains unknown for long time or the help arrive very late to the accident scene. We are developing a small system which will send an alert message or notification to any of the family member as soon as the accident takes place. The message will be an alarming message and will contain the exact location of the accident scene. If the alarm is a false alarm there will be snooze button to cancel the alarm within 10 seconds. The system will be used through a website which will create a database containing the model number of vehicle, the name of owner and the two emergency contact numbers of any family members. With this project we are aiming to decrease the missing case and also provide immediate help to accident victims.

Keywords: Internet of things, Accident detection

1. INTRODUCTION

Now-a-days, it became very difficult to know that an accident has occurred and to locate the position where it has happened. There is no system of identification and intimation regarding an accident in previous. Later on the SMS service begins for intimation purpose. It's very difficult for the lives of victims until anyone noticed and informed it to the ambulance or to any hospital and if it occurs in remote areas there will be no hope to survive.
We have designed a Vehicle fall and accident detection system which will provide you an alert message with exact location of accident scene. The system is designed for accident victims so that immediate help can be provided as soon as the accident takes place. It is an application based system which will store the model number of bike, name of owner and two emergency contact numbers. The message will be send through gps system which will contain an alarm and exact location of the accident scene. This system is a powerful tool for decreasing the death rate and missing case.

- **PROBLEM DEFINITION:** We have observed that in many severe accident cases immediate help is not send which leads to death of victims; in some cases, the family members of victims are informed after a long period of time; and in some rare cases the identity of victims remain unknown.This problem is usually faced with two wheeler vehicle where safety measures are not included yet whereas in 4-wheeler vehicle there are certain safety measures like airbags, emergency breaks,etc, hence, there is requirement for immediate help for two wheeler vehicle.
- **PROPOSED SOLUTION:** we have designed a "Vehicle fall and accident detection system" which will provide you an alert message with exact location of accident scene. The system is designed for accident victims so that immediate help can be provided as soon as the accident takes place.It is an arduino based system which will store the model number of bike, name of owner and two emergency contact numbers. The message will be send through gps system which will contain an alarm and exact location of the accident scene.This system is a powerful tool for decreasing the death rate and missing case.

The objectives of this project are:

1. Immediate information will be send to relatives of accident victim.
2. Immediate help will be send to the accident location through sms.
3. Complete coordinates of accident location will be provided to near by ambulance.
4. In case false fall detection a snooze button will be provided with a window of 10 seconds.

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The scopes of this project are:

1. Any automobile (2-wheeler) organization can use this system.
2. Any emergency vehicle can reach the accident location on time.
3. Any user information can be feeded to the system.
4. Exact coordinates is send to the relatives and nearby ambulance.
5. Provides network between the accident victim and hospital.

2. EXISTING SYSTEM

A Report on Road Accidents in India 2016, published by Transport Research wing under Ministry of Road Transport & Highways, Government of India, has revealed that more people died on roads accidents in India last year, as compared to the number of deaths in 2015.As per the data cited in the report, the country recorded at least 4,80,652 accidents in 2016, leading to 1,50,785 deaths. The number suggests that at least 413 people died everyday in 1,317 road accidents. Further breaking down the statistics, the data reveals that at least 17 deaths occurred in road accidents in 55 accidents every hour in the given time period. Comparing the new recordings with data from previous year shows that in spite of recording fewer accidents in 2016, more deaths have occurred this year as in 2015. In 2015, 1,46,133 people had died in 5,01,423 accidents. The accident severity, which is measured as the number of persons killed per 100 accidents, was recorded at 29.1 in 2015 which is lower than 31.4 in 2016.

An accident notification system for a vehicle includes a damage predicting system which detects fall of vehicle and a mobile communication terminal which receives a signal predicting injury to the vehicle occupant from the damage predicting system to generate a calling from the vehicle to a call center. The call center performs a notification to an accident response facility on the basis of the calling and obtains prediction information that the vehicle occupant has been injured from the damage predicting system.

Process flow:

Figure 1:Process Flow of Existing System "Accident notification system"

Limitations

Some limitations of the existing system are:

1. In case of false alarm snooze button is not provided.
2. Location of the vehicle is not provided.
3. Alert message is not send to emergency number and relatives.
4. Call is forwarded to the call center in case of accident alert, which will be of no use if the victim is unconscious.

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3. SYSTEM DESIGN

A. Activity Diagram

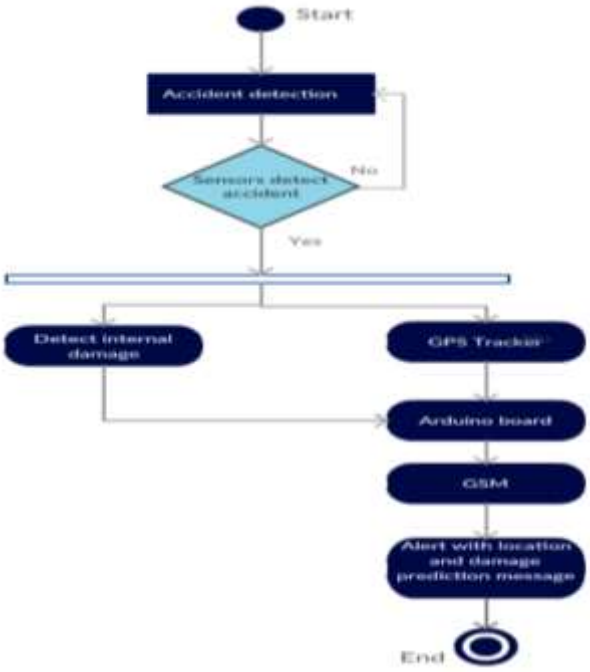

Figure 2: Activity Diagram

Activity diagram is basically a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system. The control flow is drawn from one operation to another. Activity diagram is basically a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system. The control flow is drawn from one operation to another. The activity diagram of vehicle fall and accident detection system will tell the activity of each modules. When the accident occurs the system will send data to the network tower. The network tower sends the location to the neo-6m gps tracker which receives the location and sends it to GSM module. Now, this GSM module will send exact location and alert message to the emergency number(family member's number) and helpline numbers(ambulance and police number).

B. Sequence Diagram

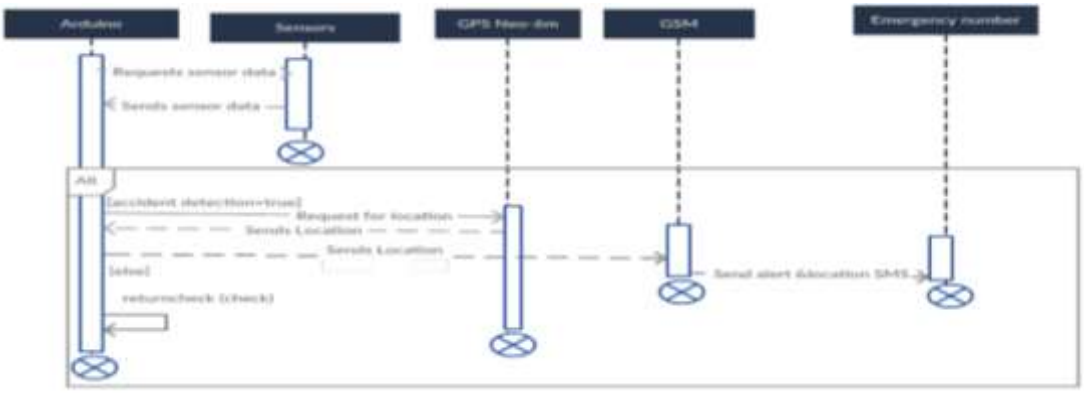

Figure 3: Sequence Diagram

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A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario.

The sequence diagram of the system will tell exchange of data between the objects of the system,i.e, the interaction of objects.

First, the sensors will sense the fall and accident of the vehicle and sends data to the arduino board. The arduino board will then verify the condition whether it is a false situation or true situation.

If the condition is false then the false alarm will give 10 seconds to press the reset button which will reset the system.

If the condition is true, the arduino will send request to the NEO-6M GPS tracker which will in return sends location to the arduino. Then the arduino will send information to the GSM module through network tower. The GSM module then will send the exact location and alert message to the emergency numbers and helpline numbers.

4. CONCLUSION

Hence the automatic alarm device for vehicle accidents has been implemented using AtMega162 microcontroller. This design is a system which can detect accidents in significantly less time and sends the basic information to first aid centre within a few seconds covering geographical coordinates, the time in which a vehicle accident has occurred. The switch provides the driver a chance to cut off emergency help systems in case the system triggers a false alarm or if the accident is not very severe and immediate help is not required. The additional Google maps interface also makes the viewing of the location easier. Additional applications of this concept are Stolen Vehicle Recovery, Fleet Management, Asset Tracking, School bus tracking for safety of children and to keep tab on drivers.

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