

BIKE CRASH DETECTION

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ABSTRACT

There are so many people who had died after meeting an accident without receiving a proper treatment immediately because of late intimation of the accident to the hospitals so we are trying to solve this problem by making a device which can send the SOS signal on crash of vehicle to the centralized command center. In this project, we are going to use ARDUINO for controlling the process and it is interfaced with GPS Receiver and GSM modules. GPS Receiver module is being used for detecting the location coordinates of the vehicle, GSM module is used for sending an SOS message in the form of an SMS with the coordinates detected from the GPS receiver along with the link to Google Map. Accelerometer namely ADXL335 is being used for detecting the accident or sudden change in any axis of the accelerometer position. Accelerometer will be detecting the sudden change in the Position of vehicle and GSM module sends the alert message to the stored emergency contact numbers with the location of the accident. The Location information of accident is sent in the form of Google Map link, which can be generated from the latitude and longitude obtained from GPS module.

Keywords: Bike crash, GPS, GSM, ADXL335, ARDUINO UNO.

I.INTRODUCTION

In Now-a-days the number of people who die due to the road accidents is increasing day by day as the number of people who are using their personal vehicles for transport has been increasing day by day. Most of the people who met with an accident would not die immediately after the impact so if the concerned authorities are informed about the accident in time the lives of the victims can be saved but most of the vehicular road accidents occur in Highways or where there are no bystanders near the location of the accident to immediately inform it to the authorities so more number of accident victims die due to lack of immediate treatment.

According to the Global Health Observatory (GHO) data made by the World Health Organization (WHO) in 2013 alone there were nearly 1.25 million road traffic deaths globally [1]. This number is much more than the number of people who die due to old age. The number of people who had died in road accidents in India alone is 207,551 which is mentioned in the Road traffic deaths by country described in the Global Health Observatory data repository made by the WHO [2]. In India the total percentage of people who had died as drivers or passengers of motorized 2- or 3-wheelers in the year 2013 is 33.9% which is way more than the number of people who had died in 4-wheeled vehicles that is 17.2% [3]. There was a total 464,000 road accidents in the year 2015 in India. The largest number of people who died in two-wheeler accidents is recorded in the states Tamil Nadu (3,668) and Maharashtra (3,146) [4].

There are so many researchers and students who had done their projects similar to our project, which are used to detect and notify the authorities about the accidents related to car accidents and they can also be implemented to bikes or 2 wheelers with the help of few modifications.

In[5], Asad Ali et al, have developed an ASAD system – which is an automated notification system that notifies the concerned authorities of the respective cities so that they can take action as soon as possible and save the lives of victims who are effected by the accident. In[6], the author have proposed the use of a vehicular Ad Hoc network which have a collision avoidance system which would warn the drivers before they reach a potentially dangerous zone. In [7], the authors have proposed a system that uses an IoT cloud system that is used for monitoring traffic and vehicular accidents prevention with the help of mobile sensor data processing.

In[8], the authors have designed a system which would detect if the driver is using a smart phone then it would alert the driver to not to use mobiles because using mobiles may distract the attention of the drivers. In[9], the authors have proposed a e-NOTIFY system that allows immediate detection of traffic accidents and alerting the authorities of the emergency services which would improve the assistance to the injured passengers by reducing the response time of emergency services with the help of relevant combinations of V2V and V2I communications. It uses the GPS connection of a vehicle to collect and transmit the location data, through internet connection provided by the road side units, to the service centre that can respond immediately. The above papers would state some different ideas for preventing accidents, detecting and notifying the accidents to the authorities but they are mainly concerned for cars, so our project would address the detection and notification of accidents for the people who travel in 2-wheelers.

II. HEADINGS

1. Introduction

2. Headings

3. Methodology

3.1. Input Module

3.2. Embedded Module

3.3. Information Module

3.4. Transmitting Module

3.5. Algorithm

4. Figures

5. Conclusion

III.METHADODOLOGY

The accident is detected by the accelerometer and an SOS signal is send through GSM to rescue centers along with the location coordinates. This is implemented by a mechanism which is shown in Figure 1 and this mechanism is divided into 5 modules.

3.1. Input Module:

The stability in position of the vehicle is observed continuously by the accelerometer. Whenever an accident takes place the stability in the position changes and is sensed by the accelerometer. This signal from accelerometer is given as a input to the processor for further operation.

Accelerometer: This is the major component and is used to sense the stability in the position of vehicle. In addition to this it is also used to detect the current acceleration of vehicle. Different types of accelerometers are available and here we are using a 3-axes accelerometer in order to detect the stability in all three possible axes.

3.2. Embedded Module:

This module is also called as interfacing module. Several components can be interfaced with each other with the help of a microprocessor. Here ARDUINO UNO is used as microprocessor. Several other microprocessors are available but the reason to choose ARDUINO is because of its simplicity and it is easily programmable. It takes the input i.e., the signal sent by the accelerometer and then triggers the GPS to track the location. Also it is used to interface Accelerometer, GPS, GSM and LCD with each other and this interfacing is done by coding in ARDUINO IDE.

3.3. Information Module:

The information about the accident i.e., the location is traced out using GPS. GPS means Global Positioning System which is used to get the coordinates of a particular location. It gets the exact latitude and its direction (either north or south) and longitude (either east or west). Along with these some extra information say time etc., are also recorded. In general GPS tracks a bulk of location coordinates. Of them the exact location of the accident which is required to transmit is selected by separate set of coding.

3.4. Transmitting Module:

The location coordinates tracked by GPS are transmitted through GSM. GSM means Global System for Mobile Communication which is used to transmit information from one system to another or to mobiles. The coordinates are sent to the rescue centers by GSM and ARDUINO. The emergency contact number is stored in the EEPROM of the ARDUINO and whenever the information is received from the GPS it is transmitted with the help of GSM. The type of GSM used is SIM28ML. Here an LCD is used for our reference so that we can check whether the location transmitted is accurate or not.

NOTE: LCD can be removed once the testing is completed.

3.5. Algorithm:

1. Is the inclination of vehicle > threshold value.
2. If yes wait for 10 seconds and check the reset status.
3. If reset button is pressed go to step 1 else proceed.
4. Track the current location using GPS.
5. Transmit these location coordinates to emergency contact numbers using GSM
6. Stop the process.

IV. FIGURES

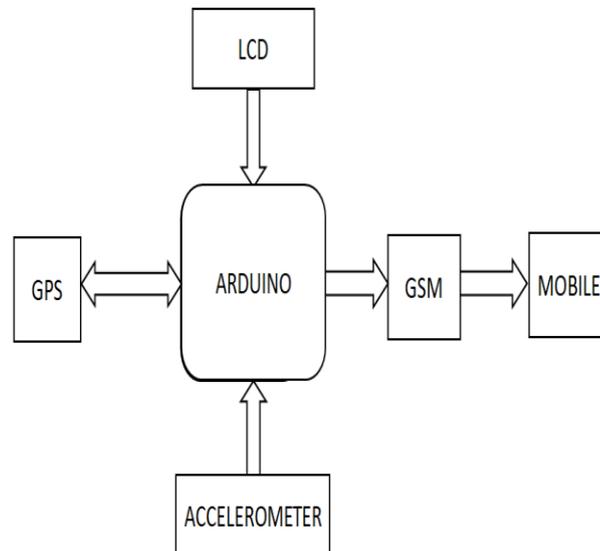


Fig1: Block Diagram

V. CONCLUSION

A System has been designed which can detect the 2-wheeler accidents and send an SOS message to the respective authorities. We have conducted some experiments by implementing the designed system on a toy bike and the message has been sent to the stored numbers when the bike is inclined at an angle more than the fixed threshold angle.

Future Scope: We can develop an Android app with the help of this app instead of getting the co-ordinates alone we can directly get the pin point location of the accident.

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