

Vehicle Crash Alert System

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Abstract

It is really very important to understand the road traffic volume in real time specially in metropolitan and developed cities for controlling traffic signals and traffic management. Controlling traffic is very difficult task for traffic control department, specially in big and metro cities. Due to heavy traffic there are lot of accidents which are caused and every time there is not any safety alert which is been provided so this project is all about saving human life in accidental case without any human assistance to notify about the accidental victim. We have designed this project with arduino, GPS modules and GSM modules, pressure sensor. In this project we will be using this module to connect together with pressure sensor using Arduino and as the pressure of desired psi impacts on the pressure sensor the Arduino will get activated and the message of current location and help will be sent to the emergency contacts of the accident victim which will include family members, nearest police station and the nearest hospital.

Keywords: *arduino, GPS modules and GSM modules, The high precision receiver, android, KNN algorithm*

1. INTRODUCTION

Vehicle crash alert system is all about saving the life of human or we can also say accidental victim and without any human assistance, in this project we are using Arduino as the main component or we can say it microcontroller and the other components which we are using are pressure sensor, GPS module, GSM module, bluetooth and a Pressure sensor, in this we will be connecting all the components to the arduino and which will be attached at the location where the cars air bag pressure sensor is attaches so as the car gets into any accidental case the pressure sensor on the Arduino will get the pressure which should be 5 psi or greater than that and as it gets this impact the Arduino will get activated, as the device gets activated, using GPS module the device will get the current location of the vehicle and using the KNN algorithm we will find the nearest hospital and the police station from the current location of the accidental victim, as we get the tract or the location of the nearest hospital and police station, using GSM module the device will send the message containing current location and need of emergency help to the emergency contacts such as family members, nearest hospital and the nearest police station so this will be without any human assistance and the accidental victim will get help as soon as possible at the current location, this is how we can save life of someone in vehicle crash.

2. SYSTEM ARCHITECTURE

Accident can be sensed as when there is a dash between two vehicle or if the vehicle collides to ant hard object, it can be in any mean. The pressure sensor is attached to vehicle which covers the whole cars pressure impact as cars air bag system does and the sensor are connected to the OR circuit[11 12]. OR gate logic is applied because to detect the minimum amount of pressure which will be on the car at the time of accidental impact. The output of the OR is connected to the interrupt pin on microcontroller and whenever the pin 12 gets the high value the microcontroller sends the message about the accidental case.

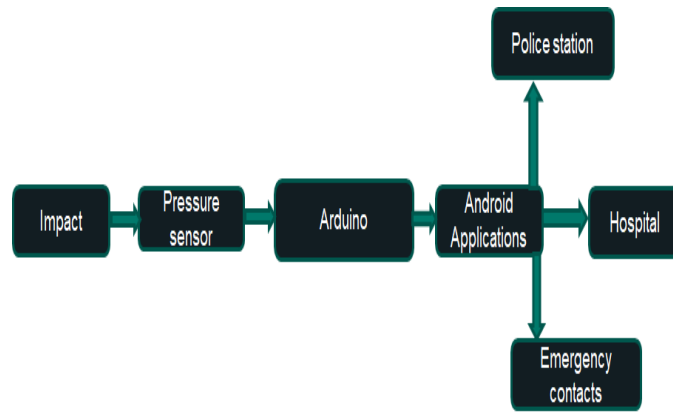


Fig-1: Working of the system

3. BLOCK DIAGRAM

This is the diagram which represents the circuit of the crash alert system as how exactly it works. It shows the general view of how the crash alert system exactly works in the circuit diagram. Basically the blocks in this diagram are , Android Device, pressure sensor(impact sensor), Bluetooth module, LCD screen, Arduino, and power supply.

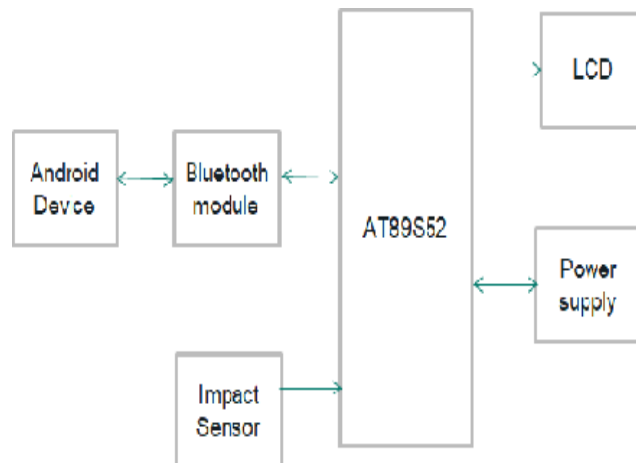


Fig-2: Block Diagram of the system

4. METHODOLOGY

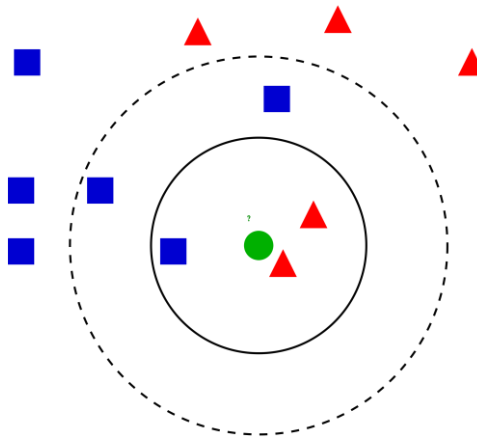
In this project, the transmitter will send the signal to receiver side, i.e. suppose, every signal or checkpoint has its own receiver. He will receive the transmitted signal from transmitter, all it will be saved on cloud. When the respected signal is received by the receiver, he will send the according data on cloud in the form of notification. If possible we can interface here a GPS module for GPS Fencing Technology and along with this, if possible we can use here Android Application.

4.1 Proposed Methodology

- When the vehicle crashes it activates the pressure sensor connected to the vehicle
- The pressure sensor is connected to the arduino which is also connected to the application which will be installed on cell phone
- This Android app is built for the android devices (Vehicle Monitoring System)
- We have used android studio to develop the application for our project

- The application developed has a user sign in page, a user signs up page where the details of the user are taken for verification along with the vehicle license plate and emergency contact details
- The Arduino is connected to the pressure sensor.
- This pressure sensor is used to sense the impact on the vehicle.
- Right after impact the GPS and GSM modules come to use.
- The GPS module compare the coordinates and gets the current location of the accidental site.
- With the help of GPS module we will be also able to trace the location of the vehicle
- The GSM module is used to send the exact coordinates of the vehicle via a text message.
- The Android application developed is used for sending the notification to the hospitals and the police station located nearest the accident site.
- This procedure is done with the use of KNN algorithm.

4.2 KNN Algorithm



- The KNN algorithm is a method which is used for classification and regression operations.
- It gives out the output as class membership.
- The object is classified with the help of its neighbour object.
- In KNN regression, the output gives the property and value of object.
- The value which we get in the output is the average values of the KNN.
- KNN is also called as lazy algorithm
- In KNN algorithm, K is a factor which has a specific value (range)
- It is used to find the object in the nearest to the “k” constant.
- Here we have used KNN algorithm to get the location of the accident
- It is used to find the nearest hospital and the nearest police station from the current location of the vehicle.
- Here, we detect the nearest located hospital and police station via a Google GPS coordinates and Google Maps.

4.3 Feasibility Study

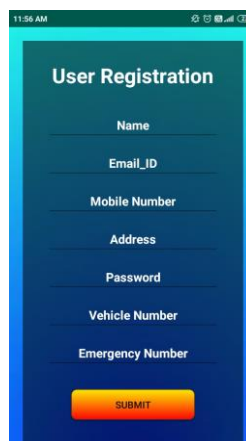
- In this project we have tried to implement devices which can save human life efficiently.
- One can rely on this system and no human interaction is required.
- The system is made affordable with respect to every person's point of view.
- Risk management after accidents and getting faster help for the victim is the first and foremost aim of the given project thereby saving as much lives as possible.

5. RESULTS AND DISCUSSION

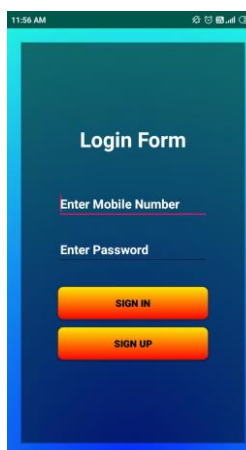
- **Android Application Home Page**



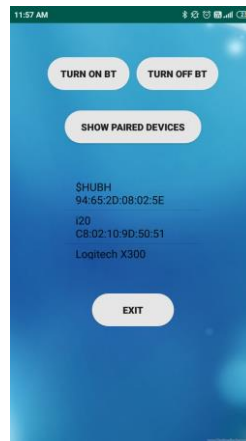
- **Sign Up Page**



- **Sign In Page**



- **Bluetooth Connection**



6. CONCLUSION

Vehicle crash alert system is regarding the safety of human in an emergency accidental cases, where as soon as the vehicle get crashed due to the pressure sensor which sense the pressure of 5 psi the pressure sensor gets activated which is attached on the Arduino which also is connected with GPS ,GSM and Bluetooth module, all of the components work together to give the best result out of it, and this device is really very useful where the accident victim is not surrounded by any human or there is no any human to help the accidental victim, this system works without human assistance and provides help for the emergency times , as in these days lot of the accidental deaths are caused just because there is no any help which is been provided to the accidental victim on time as due to lack of emergency medical care many have lost their lives, but this device will overcome all such drawbacks.

7. FUTURE SCOPE

- In future, we will be trying to avoid the accident before it occurs.
- For that we need totally automated vehicles or electric vehicles with DC motors.
- As the manual vehicles are not compatible to be controlled without human interference
- At present, India is a developing country where we have not reached the totally automated vehicle system on roads.
- So as we get development in automation for vehicles we will be able to avoid the situation where the accident can occur with any kind of human negligence or mistake.
- The device will be totally controlling the DC motor or the automated vehicle to get control on the vehicle before any vulnerable situation or accidental case.
- This is logic predicted for future scope of the project.

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