

# Car Accident Detection Via Smartphones

<sup>#1</sup>Prof. R.T. Umbare, <sup>#2</sup>Sharayu Lohar, <sup>#3</sup>Poonam Lohar, <sup>#4</sup>Apurva Jejurikar, <sup>#5</sup>Nikhita Deshmane



<sup>1</sup>umbarerupali1@gmail.com  
<sup>2</sup>lohsha97@gmail.com  
<sup>3</sup>poonamlohar1997@gmail.com  
<sup>4</sup>apurvajj4@gmail.com  
<sup>5</sup>nikitadeshmane9697@gmail.com

<sup>#12345</sup>Department of Computer Engineering,

JSPM's Rajarshri Shahu College of Engineering,  
 Savitribai Phule Pune University, Pune-41, India

## ABSTRACT

Whenever Accident Occurs problem with the Existing System is that the victim depend on the mercy of nearby people. There might be the possibility that there are no people present near the accident spot or people who are around might neglect the accident. This is the flaw in the manual system. So, to overcome from this flaw from manual system, we came up with an Idea of a system which will detect an Accident and will send the related information of user /driver to the nearby police station, Hospitals and Also to their Relatives. Our system uses inbuilt sensors in smartphones, i.e., accelerometers. whether the accident is occurred or not is determined with the Location of user, as well as provide emergency communication and location tracking services in a remote car that meets an unfortunate accident or any other emergency situation. The system either starts automatically or may be triggered manually instantly after an accident. It initiates communication and shares critical information like location information, a set of Accident images are taken from prefixed angles with appropriate server or authority. To monitor the exact condition in real-time basis, Allocation of interactive real-time multimedia communication, real-time location tracking etc. has also been integrated to the proposed system.

**Keywords:** Location tracking, Android Application, Accident Spot, Alert, Notification.

## ARTICLE INFO

### Article History

Received: 31<sup>st</sup> May 2019

Received in revised form :

31<sup>st</sup> May 2019

Accepted: 2<sup>nd</sup> June 2019

**Published online :**

**3<sup>rd</sup> June 2019**

## I. INTRODUCTION

In recent years road safety is an important area for research and action programmed has received a great deal of scientific attention. Progress has been made on several different fronts but in one area there would appear to be a serious lack of interest or, at the very least, a paucity of published information and informed debate. This area concerns the degree to which our thinking and our solutions are combined into a particular view of technology and society. They are castigated to produce view of technology and society. They are castigated to produce incremental improvements but no excessive alteration in the magnitude or structure of the problem itself. In the case of road safety, it can be argued that solutions which build on the acceptance of life motor car as a major and immutable technology will reinforce that position and generate a primary paradox: solutions designed to reduce a major

negative effect of motorized transport contribute to the perpetuation of the circumstances which lead to road traffic accidents. Traffic accidents are a major public issue worldwide. Road traffic accident causes the huge number of injuries and death road traffic accident discovers the story of global disaster of road safety. People between the ages of 5 and 29 are second leading cause of death and third leading cause for people between 30 and 44 in road collision. According to statistical projection of traffic fatalities, the two-year comparison of total driver participation in mortal crashes presented a three percent increases.

## II. RELATED WORK

(Subha Koley, Prasun Ghosal, 2017) explains that this system is when a vehicle meets an accident the system starts automatically and tracks its location and takes some

of its initial photos with the preinstalled cameras and sends them immediately to the emergency control room<sup>[1]</sup>. The control room system automatically finds the nearest hospital and police station and forwards the message to them. When a car meets any emergency situation the system starts automatically or manually according to the type of the situation and sends emergency message to the control room. An android app that specifies the location name when the mobile receives GPS data plays a major role in the paper.

(Bannaravuri Amrutha valli, Prathiba Jonnala, 2017) This system has used for accident detection which is about using accelerometer sensor in the vehicle side<sup>[2]</sup>. And at the receiver side the location of the accident can be known by displaying the occurrence location name with the newly developed android application. By identifying the changes in the accelerometer sensor tilt the possibility of accident can be known with more accuracy level.

(Jorge Zaldivar, Carlos T. Calafate, Juan Carlos Cano, Pietro Manzoni, 2011) have introduced a system by combining smartphones with existing vehicles through an appropriate interface we are able to move closer to the smart vehicle paradigm, offering the user new functionalities and services when driving<sup>[3]</sup>. In this paper we propose an Android based application that monitors the vehicle through an On-Board Diagnostics (OBD-II) interface, being able to detect accidents. Our proposed application estimates the G force experienced by the passengers in case of a frontal collision, which is used together with airbag triggers to detect accidents.

### III. PROPOSED FLOW

In the Proposed System, we used hardware component i.e. Ultrasonic sensor And Buzzer whenever user enter into car it will notify user to logging into to the system. The proposed System used KNN (k-Nearest Neighbours) algorithm to find nearest hospital and police station. Output is a class membership in KNN classification. An object is classified by a majority vote of its neighbours, object will be assigned to the class most common among its  $k$  nearest neighbours ( $k$  is a positive integer, typically small). The object is assigned to the class of that single nearest neighbour, If  $k=1$ . Output is the property value for the object in KNN regression. This value is the average of the values of its  $k$  nearest neighbour's. The actual flow of system is explained by using algorithm:

- (1) Start Application
- (2) Provide Authentication
  - Input: (User Name, Password)
  - Output: If (valid user)
    - Successfully login
    - Else
      - Login Failed
- (3) Start Driving Mode
- (4) System start in background (Motion detection start using accelerometer sensor)
- (5) If motion detected then it will consider it as accident.
- (6) If user respond to system then it will destroy the alert.
- (7) If user not respond then it will consider it as accident

& send information to relative, nearest hospital and police station.

Input: (Location (Latitude and Longitude), Image)

Algorithm: KNN

Input: Location (Latitude and Longitude)

Process: KNN will find nearest police station and hospital from database.

Output: Send information.

(8) End

### IV. PROPOSED SYSTEM

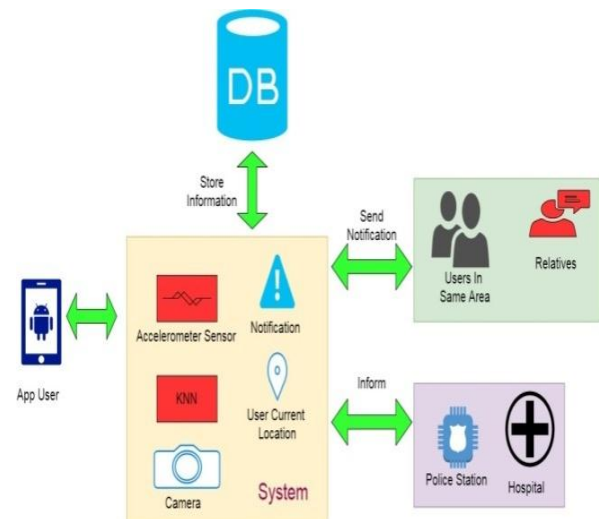


Figure 1: System diagram

In proposed system, our system place user's mobile on desk at the time of driving. Accident is detected with the help of accelerometer sensor. When accident is occurred, it checks accident is occurred or not by sending alert notification to application user. If user responds to system with confirmation that user is ok then system will be in normal mode. If user gives no response or tells that user is not ok then system will take photo from front camera and with current address sends all information to nearest hospital, police station and user relatives.

#### A. User:

In this module user register into the system. All information (Name, Mobile No., UID No., License No., and Password) of user stored into data based. User places the mobile in car. This application also shows accident spots. So, user can take precaution about accident.

#### B. Admin:

After detecting accident, system will alert to user and take the response if user doesn't response to system then system consider that accident actually occurred. System will collect accident spot information (Location, Username) and then stored into database. After collecting data, the system searches the nearest hospital and police station.

#### C. Inform nearest hospital and police station:

System at the background searching the nearest location of police and hospital. After searching done system request successfully send to that police station. In this model user current location used to find nearest hospital and police station.

#### D. Inform to relatives and other user:

After detecting accident system inform to nearest user to avoid the traffic. System also inform to relatives by sending SMS. Relative's mobile number is store at user registration.

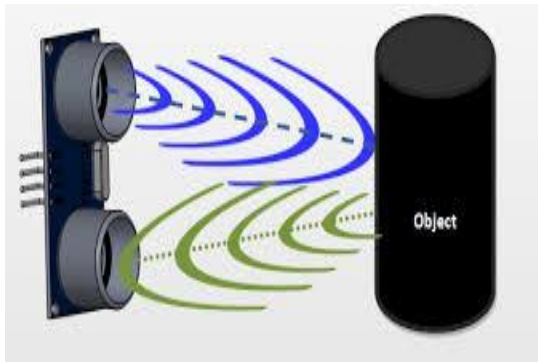


Figure 2: Working of ultrasonic sensor

Ultrasonic Sensor is used for detecting presence of an object, that object can be user. Ultrasonic Sensors or Ultrasonic transducers are type of acoustic sensor. Transmitters are used to convert electrical signals into ultrasound, receivers can convert ultrasound into electrical signals, and transceivers can both transmit and receive ultrasound.

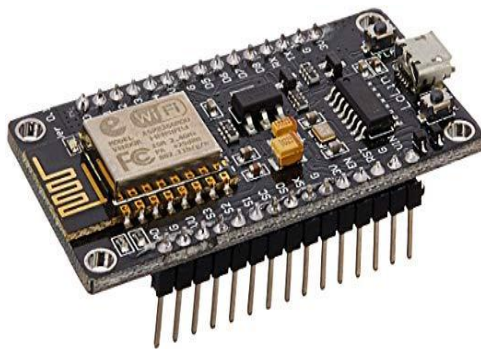


Figure 3: ESP8266 Microcontroller

The ESP8266 is a microcontroller having low cost microchip with full TCP/IP and microcontroller stack capability that allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands.

**V. RESULT**

There is inbuilt Accelerometer sensor in mobile which is used for detection of accident. Accelerometer sensor helps us to detect an accident. Automation system speedup the service and treatment. This reduce the death ratio after accident.

From the status of accelerometer sensor The confirmation of an accident is determined. Sensor gives data about accident from shaking or tilting your smartphones. Changes in threshold values of the sensor fixes the chances for occurrence of accident. If the current value goes beyond threshold value then accident is detected.

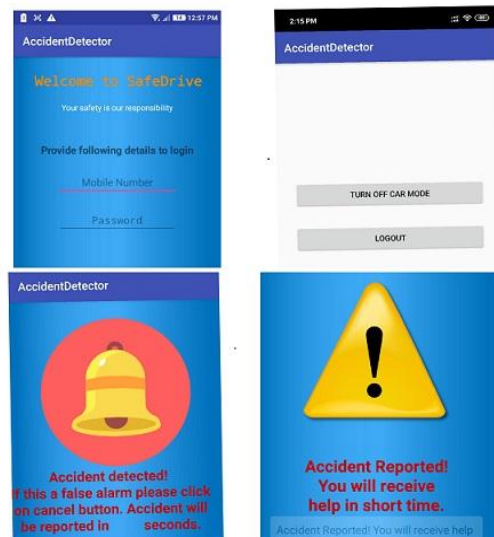


Figure 5: Application Window

After detecting accident, system will alert to user and take the response if user doesn't response to system within the given Time span of 15 seconds then system report the activity as an accident.

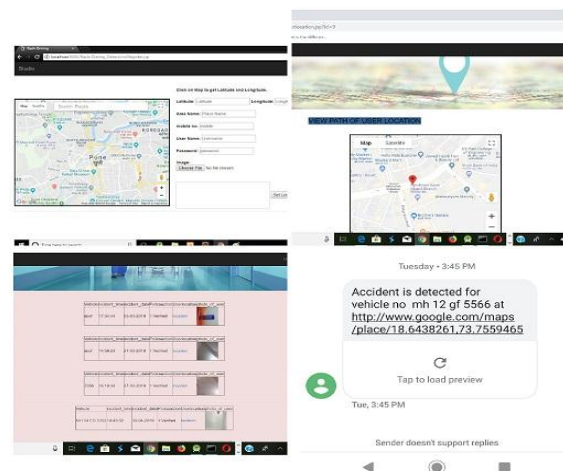


Figure 6: Web Based System

This system develops an accident detection mechanism based on an Android smartphone. This accident detection and alert system provide emergency responders with crucial information at the earliest possible time. Reducing the time between when an accident takes place and when it is detected can reduce mortality rates. The entire works have to be integrated with the automobile to validate its functionality and reliability.

In this application user register into the system. All information of user stored into databased. User place the mobile in car desk.

Thus, this work will reduce the accident death ratio in considerable amount even in rural roads. Then it has a great importance in day to day life of the people in the country like India. We define one user defined algorithm for accident detection. At the time of registration, application takes personal information like blood group, age, photographs etc.

Modules	Time
Login	1 Sec
Accident detection	2 Sec
Image capture	3 Sec
GPS data	2 Sec
Data send on server	2 Sec
Hospital & Police station	2 Sec
Message	20 Sec
Total Time	35 Sec

Table 1: System Performance

In the above table we have calculated the time needed for execution of each modules of our System. The overall time is 35 Sec which is very less as compare to existing System.

Depending upon Network type the performance and time will vary.

Network	2G	3G	4G
Time	70-80Sec	50-60 Sec	35 Sec

Table 2: System Performance with Different Type of Network.

## VI. CONCLUSION

Result shows that the application developed is able to correctly fulfill its purpose within a short time period. Overall time required to perform all the tasks, including the delivery of an SMS with the accident details, followed by providing the nearby police station and hospital details and providing them an alert message of the user accident with exact location of user, is taking short time period.

## VII. ACKNOWLEDGEMENT

I wish to express my profound thanks to all who helped us directly or indirectly in making this paper. Finally, I wish to thank to all our group members and well-wishers who supported us in completing this paper successfully I am especially grateful to our guide **Prof. R. T. Umbare** for time to time, very much needed, valuable guidance. Without the full support and cheerful encouragement of my guide, the paper would not have been completed on time.

## REFERENCES

- [1] Subha Koley, Prasun Ghosal, "An IoT Enabled Real-Time Communication and Location Tracking System for Vehicular Emergency," IEEE Computer Society Annual Symposium on VLSI, 2159-3477/17,2017.
- [2] Bannaravuri Amrutha valli, Prathiba Jannala "Vehicle Positioning System with Accident Detection Using Accelerometer Sensor and Android Technology," IEEE International Conference on Technological Innovations in ICT For Agriculture and Rural Development (TIAR 2017), 978-1-5090-4437-5/17,2017.
- [3] Jorge Saldivar, Carlos T. Calafate, Juan Carlos Cano, Pietro Manzoni "Providing Accident Detection in Vehicular Networks through OBD-II Devices and Android-based Smartphones," IEEE Workshop On User

Mobility and Vehicular Network, 978-1-61284-928-7/11,2011.

- [4] Tang Shumin et al., "Traffic Incident Detection Algorithm Based on Non-parameter Regression," IEEE 5th International Conference on Intelligent Transportation Systems, pp.714 -719,2002.
- [5] Hu Rufu et al., "Study on the Method of Freeway Incident Detection Using Wireless Positioning Terminal," International Conference on Intelligent Computation Technology and Automation (ICICTA 2008), pp. 293-297,2008.
- [6] R. K. Megalingam, et al., "Wireless Vehicular Accident Detection and Reporting System," Proceedings of the ICMET 2010, pp. 636-640,2010.
- [7] G. Marfia, et al., "Safe Driving in LA: Report from the Greatest Intervehicular Accident Detection Test Ever," IEEE Tran. on Vehicular Technology, vol. 62, no. 2, pp. 522-535, Feb.2013.
- [8] Long Le, Andreas Festag, Roberto Baldessari, Wenhui Zhang, "Vehicular Wireless Short-Range Communication for Improving Intersection Safety," IEEE Communications Magazine, vol. 47, no. 11, pp. 104-110, Nov.2009.