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Paper Authors

S. PRIYANKA, V.CHINMAYI,J.ATCHIYAMMA,CH. DEVI

WISTM College, Pendurthi, Visakhapatnam, A.P

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SMART ACCIDENT NOTIFICATION SYSTEM

[1]S. PRIYANKA, [2]V.CHINMAYI,[3]J.ATCHIYAMMA,[4]CH. DEVI

[1,2,3]Dept. of CSE, WISTM College, Pendurthi, Visakhapatnam, A.P

[4]Assistant Professor, Dept. of CSE, WISTM College, Pendurthi, Visakhapatnam, A.P

[1]priyankasitamreddi@gmail.com, [2]venigalla97@gmail.com, [3]archanaj1606@gmail.com,
[4]chokkakula.devi@gmail.com

Abstract

Automatic Accident Notification System detects accidents by monitoring vehicle standing position, vibration threshold. This solution also tracks vehicle location through location sensors. On instance of accident detection, the system immediately alerts the configured user through SMS. Also based on the location of the incident happens, the system identifies the nearest hospital and send information to the hospital. This is a mobile app based system.The system is connected to cloud through android based mobile phone. It periodically updates its location to cloud. The cloud system identifies nearest hospitals and updated the contact information back to the system. Using Google Maps APIs, system will get the nearest hospital information. Also, the accident location information will be recorded for analytic purpose. These analytics will be useful to the RTO to derive accident prone zones, caution zones, first aid centers.

1.Introduction:

The rapid growth of population and vehicles has also increases the traffic hazards and the road accidents. Due to this the life of the people is under high risk. AcccidentManagementSystem is introduced in this paper. The purpose of this system is to detect the accident in less time and sends the location information to near by hospitals as well as their emergency contacts. The location information can be traced by using GPS (Global Positing System) and messages will be sent by using GSM module(Global System For Mobile Communication) and Msg91 which can detect accidents in significantly less time and sends the basic information to the first aid centers within a shorttime covering Latitude and Longitude.

This alert message is sent to the rescue team like hospitals, police station and their emergency contacts in a short time, which will help in saving the valuable lives. A Switch is also given in order to stop the sending of a message in rare case where there is no morality,the precious time of the medical rescue team can be saved. When the accident occurs an alert message is automatically sent to the hospitals,rescue team, and emergency contacts and to the police station. The SMS is sent using the GSM module and the location of the accident spot is detected using the GPS module. The accidentcan be detected precisely with the help of both Accelerometer sensor and vibration sensor.

The Angle of the rolls over of the car can also be known by the message through the Accelerometer sensor. This application supplies the best solution to poor emergency facilities provided to the road accidents in the most attainable way.This system will check whether an accident has occurred or not and identify the seriousness of the injury to the accident victim, once the accident has occurred, the system will check the nearest hospitals and notifies them about the accident as well as it sends an alert message to their emergency contacts.

2.Literature Survey

Accident Notification System has been extensively studied over the past several years. Research work in this field has proposed a Telematics model which has three main modules. This system is intended to capture the location of the vehicle through the GPS receiver, sends the location information to the nearest hospital and their emergency contacts numbers through the SMS.Here a low cost alert system is proposed to provide immediate medical aid to the accident victims by alerting the nearby hospitals and their emergency contacts with the exact place of accident and the details of the patient through the SMS.

- The Emergency ambulance services can be made easily with user friendly mobile application which can be installed on any of user smart phones.
- The mobile application is automatically detects accidents by using the in-built mobile sensors and sends alert to all the nearby hospitals and emergency contacts.
- The application collects hospitals location information from GOOGLE MAPS API. The application also displays all the registered hospital contacts.
- Interaction between the smartphone and the centralized database can be done using REST APIs.

User login into their account and they can register the emergency contacts in to the application. They need to activate the service to detect the accident. In this application users can view their travelled history, fatal incidents occurred to the user, current trip timings and they can send feedback about the application.

Hospitals register their mobile numbers into the application whenever the accident occur then the hospitals will get the offline messages of the location of accident.

3.Existing System:

There are some Rescue services, they are available offline and they are very far to the remote areas. Generally speaking, the existing system doesn't have accurate services to the specific location.

Existing system uses only GSM modules for sending the messages, it will send only messages. It doesnot send detect the location of the accident occurred.

4.Proposed System:

The proposed system consists of an accident notification system will constantly monitor the vehicle and the accelerometer sensor detects whether the vehicle is in normal driving posture or has fallen down. When the vehicle fall is detected it automatically sends the alert notifications to the nearest hospital and their emergency contacts.

The proposed system uses GPS module for detecting the location.

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Advantages:

- We are giving a system which works very fast and helps the users to reach the hospitals as early as possible.
- In this system, an idea is proposed for saving a victims life in a faster way possible.
- With this Application, the hospital services and their emergency contacts can reach the patients location is given through the app.
- We are not using any external hardware for detecting the accident.
- It will send offline messages to emergency contacts and hospitals.
- It will describes the WHO rules.
- It displays the historical data.
- In this application previous travelled history also available.

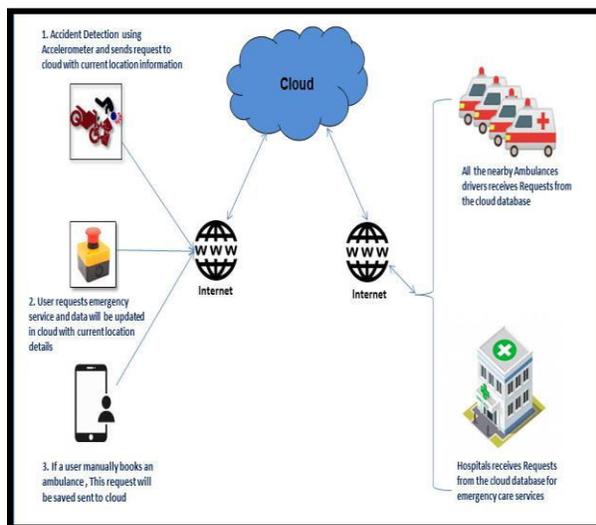**4.1 System Architecture:**

fig: system architecture

This architecture describes the work flow of Smart Accident Notification system. In this system when a user met with an accident , then the accident is detected through the accelerometer sensor and it automatically activate GPS module, through gps it will detect the location of the accident and it automatically sends the offline alert messages to near by hospitals as well as their emergency contacts.
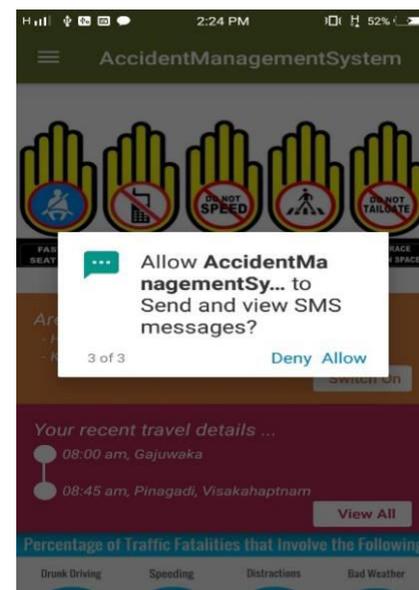
The emergency contacts details and registered hospitals details will be updated in the database. From that the data will be accessed.

4.2 Modules Description:

4.2.1 User:

- Login
- My Profile
- Home
- Fatal Incidents
- Current Trip
- My Trips
- Analytics
- WHO data
- Feedback
- Forgot Password
- Share
- Follow on Twitter
- Logout

Allow services screen
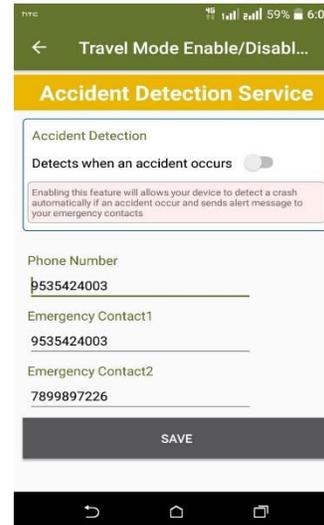
Home screen

Features:

- Login: User can securely log into their account
- Home: Home screen contains recent travel details and percentage of traffic facilitates that involve (Drunk Driving, Speeding, Directions, Bad weather).
- My profile: This option allows the users to view or update profile details like, mobile number and emergency contacts details.
- Fatal Incidents: User can view their fatal incidents details occur to the user when travelling
- Current Trip: By this option, User can view the current trip timer in the application.
- My Trips: User can see the history of locations they travelled.
- Messages: In this option emergency contacts will get the offline message when the related person met with an accident.

- Feedback: Users can send feedbacks about the application.
- Forgot Password: In this option if the user forgot their password they can reset their password.
- Share: User can share our app
- Follow On twitter: If the user follow our app in twitter they will get the updates of the application.
- Logout: This option allow user to securely exit from application.

Registering Emergency Contact Details:

4.2.2Hospitals:

- Login
- Registering Hospitals
- Logout

Login Screen

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Driver Register Screen:

Features:

- Login: User can securely log into their account
- My Profile: Used to view or edit their details.
- Logout: Securely exit from application.

4.3 Methodology:

Floyd-WarshallAlgorithm for finding the distance between accident occurred :

Floyd's algorithm is used to find the shortest path between any two vertices. Where each edge contains the weigth , which is positive or negative. The main advantage of this algorithm is , it will find shortes path between any two vertices. It will find the path by using $O(V^3)$.

Step-1. First we need to initialize the vertices with infinity.

Step-2. Then find all pairs shortest path with 0 intermediate vertices.

Step-3.Then find shortest path with 1 intermediate vertices and so on… by using N vertices as intermediate nodes.

Step-4.Then minimize the shortest path between any two pairs of intermediate nodes in the previous step.

For any 2 vertices (a,b), one can definitely minimize the distance between the pairs using the first k nodes, so that the shortest path will be

min(dist[a][k]+dist[k][b],dist[a][b]).
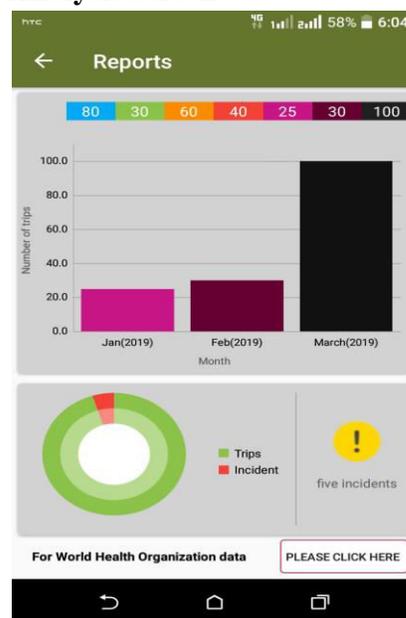
Dis[a][k] represents the shortest path between the two nodes a and k with k nodes , as well as Dis[k][b] represents the shortest path between the two nodes k and b with k nodes.

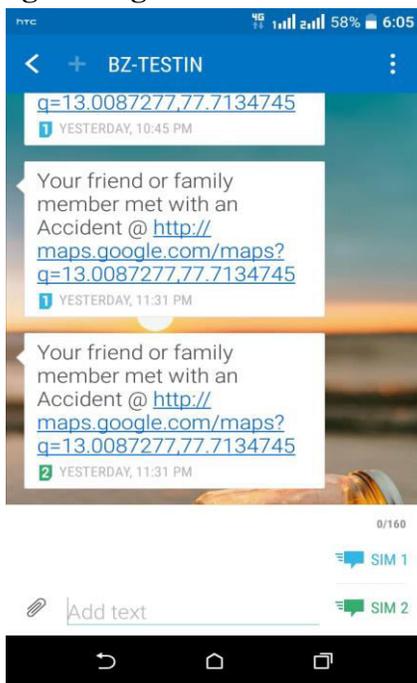This Floyd-Warshall's algorithm calculate the time complexity by using $O(V^3)$.

```
for(int k =1; k <= n; k++){
for(int a=1; a<= n; a++){
for(int b=1; b<= n; b++){
dist[a][b]=
min(dist[a][b],dist[a][k]+dist[k][b]);
}
}
}
```
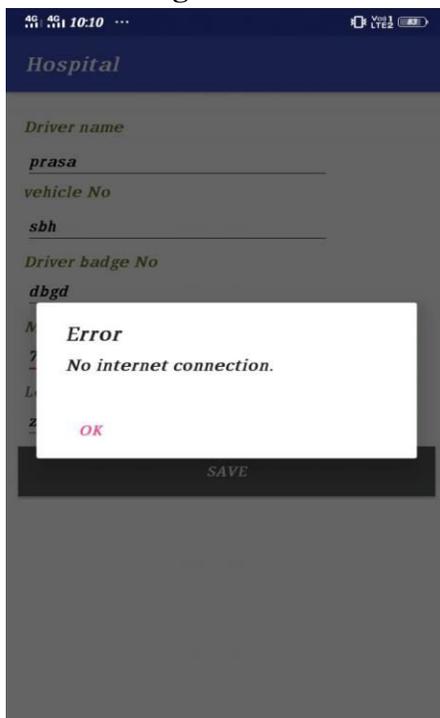
6.Results:

Analysis screen

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Sending Message Screen

Internet Checking Screen

7. Conclusion:

The investigation is going on for tracing the position of the vehicle. In this project GPS is used for tracing the position of the vehicle, GSM is used for sending the message and

the when an accident has been detected. Hence with this project encatment we can detect the position of the vehicle where the accident has occurred and it will automatically send offline messages to emergency contacts and hospitals.

Future Enhancement:

Future scope of this project can be planned by using some of the similar concepts used in this project.By using the application ambulance services can be provided. Police can help to the victm if they know the location of accident occurred. Police also view the location through GPS and they can generate the report regarding to the incident.

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