An Web Based Emergency Alert System

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Abstract:
In developing as well as developed countries where population density is high, everyday some fraction of people lose their lives because of accidents and its after-effects as there may or may not be proper infrastructure of providing emergency facilities. If medical facilities are provided at the right time more number of lives can be saved. Vehicle accidents are one of the most leading causes of fatality in many countries. The time between an occurrence of accident and the arrival of emergency medical personnel that are dispatched to the accident location is the important factor in the survival rates after an accident. By eliminating that time, mortality rates can be reduced to a certain extent. One approach that we can follow is to eliminate that delay between accidents is to use An Accident Emergency Alert Systems which senses when an accident occurs and immediately notify the emergency occurred to police and hospitals. Vehicle accidents are one of the most leading causes of fatality in past few years and an effective Solution must be in place. In this paper, a system is proposed whose main objective is early accident detection by capturing the image of the accident, which contains the time-stamp, date-stamp, location where the accident has occurred.

Index Terms: Camera, GPS (Global Position System), Android App Development, MySQL

I. Introduction

Accidents are increasing now days. It is found that Accidents are caused because of two important parameters, one is not following traffic rules and other is overtaking, rash-driving, alcohol-abuse, etc. Life of the people is under risk as millions of people die every year as result of Accidents on Highways, Express-ways and cities. Due to the delay in the arrival of ambulance and other emergency services such as Fire-fighters and police to the accident spot it leads to the loss of human life. So, in Post-Accident scenario the first priority is to take the accident victim to the hospital as early as possible. There needs to be an effective solution to address this major issue. By proposing this system we tend to lower the rate of accidents.

II. Layout of Paper

The paper is divided into following parts viz, Introduction, Layout of paper Existing system ,Proposed system Architecture ,Mathematical Model, Algorithms and Technologies, Future Work, Acknowledgement ,conclusion and References

III. Existing System

The Existing system provides certain solutions which provide efficiency till a certain amount. At certain scenarios these systems may fail to address the solution properly. The existing system provides solutions in the form of Help-Lines, Toll-free numbers, Control-Room help-line, etc. These systems may not

provide efficient solutions. So inorder to address the post-accident scenario we are proposing a web-based emergency alert system.

IV. Proposed System

Time plays a very critical role after an accident has occurred, If the victims are not taken to the hospitals on time, They may die. The Proposed system is a web-based system which can detect the accident and alert the emergency services within the critical time and try to save people involved in the accident. It involves the following components/modules which are described in the Architecture diagram.

1. Architecture Diagram

The proposed system in preventing the accidents provides the following functionalities

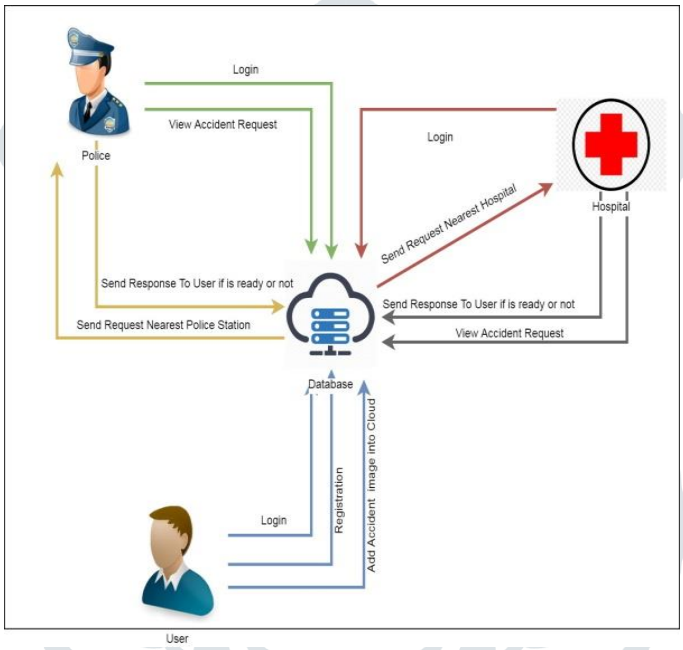

Figure 1

1. An android -app based will be used for capturing the image of accidents that is occurred. the captured image contains a time-stamp, date-stamp and latitudes and longitudes of location.
2. A java-based back-end where all the processing will be done and k-NN implementation will be used so that the system will find the nearest available police-stations and hospitals which in turn will respond to the notifications.
3. Login and Registration Module:-Hospitals, Police-stations and fire fighters must register with this app so as to receive the notifications regarding the accidents occurred.
4. Database:- database stores the information regarding the location, time and date, and images of the accidents

1.1 Mathematical Model

System Description:

Input:

u=No of user
u=u1, u2, u3,.,u nth
GPS =Global Position System
Camera

Process:
Process1: User- User Registration and Log in
Process2: User Take accident Picture with current location
Process3: Police- Log in and View Accident Location and Take Action.
Process4: Hospital- Log in and View Accident Location and Send immediate Ambulance Services.

Output:
O=Generate the report of every accident.

V. Technologies and Algorithm Used

1. k-NN Algorithm

k-NN algorithm is a classification based algorithm and used in machine-learning and applied fields. It is also named as lazy algorithm as it does not contain an explicit training phase. k-NN algorithm is very beneficial as it does not require little or no prior knowledge of distribution data. We can say that k-NN algorithm is very much based on how close the features resemble our training data-set and perform the classification accordingly. It is also useful in detecting the outliers in a given data-set. Basically, it classifies the neighbours based on distance functions.

2. Haversine formula:

The Haversine formula determines the great-circle distance between two points on a sphere given their longitudes and latitudes. Important in navigation, it is a special case of a more general formula in spherical trigonometry

2.1 Equation

$$d = 2r \arcsin*\sqrt{\text{hav}(\varphi 2 - \varphi 1) + \cos(\varphi 1)\cos(\varphi 2)\text{hav}(\lambda 2 - \lambda 1)} \quad \text{--Eq.1}$$

VI. Acknowledgements

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VII. Future Work

The Proposed system can be extended by using sound sensor, so that it becomes more accurate and efficient to detect and avoid the accident. During night-time or in case of any other problem such as climate

the system can be extended using deep-learning and by install devices near highways which will detect the accident and report the emergency services automatically.

VIII. Conclusion

The proposed system is developed to provide the information about the occurred accident and the location of the accident .It helps to easily provide assistance to the victim. This system uses GPS module to locate the vehicle.The results of the proposed systems are under evaluation and satisfactory.

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