Android Application for Automatic Vehicle Crash Notification System

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Abstract **- In today's world, accidents are the root cause of death. These can occasionally result in patients being kept in the hospital for a lengthy period. This commonly occurs because of the folks reacting to the accidents are not the mark which caused the person to die. This paper proposes an alert system as a real-time solution to this problem, as well as police and ambulance drivers being notified. This is done with the help of readily available technology gadget Mobile phones which are used to detect falls. An Android device in which accelerometer imposed internally is utilized for the detection of a fall. The frequency will be determined by the sensor, which caused the phone to vibrate in response to the fall. The threshold is determined by factors such as height and the vibration frequency. If it exceeds the predetermined threshold, an interface having particular poll is displayed asking the user to respond. Further action is performed depending on the response given by the user. If users don't answer within a given time frame, an alarm and notification will be promptly issued to the necessary specific people whose contacts had the user given while enrolling for the program. Police and ambulance drivers are also provided an alert and message via SMS that includes the victim's accident location. The system described in this study uses a straightforward, user-friendly Android application to detect falls at a low cost.**

Index Terms **- Accident detection, Alert system, Accelerometer Sensor, SMS Alert, Fall detection.**

I.INTRODUCTION

Accidents on the road pose a severe threat to human life. Many of the accidents are caused by a lack of speed. The statistics that have been compiled based on recent surveys are quite appalling. According to a poll performed by Hindustan Times in India in 2020, one person dies in a traffic accident every three minutes, with 60 percent of incidents caused by human error.

According to the latest WHO report published in the Times of India, India ranks first in the world in terms of road accident fatalities. According to a study, fifty percent of fatalities caused by automobile accidents may have been avoided if they had received urgent medical attention. Most often, accidents create casualties not because they are particularly serious, but rather because the proper medical care was not available. Delay in receiving medical help is one of the leading causes of casualties.

Therefore, it is crucial in this situation to create technology that makes tracking accident cases simpler, thereby reducing the death rate.

II. MOTIVATION

Many earlier works have been done in the area of accident detection and reporting. Manual accident detection was one of the ways used to detect accidents. Wanderers passing by the accident spot alerted the appropriate medical crisis units, who then took some necessary safety precautions. However, this system had a flaw in that its effectiveness was unreliable because someone had to observe the accident. Due of the witness's expression problem mislead the concerned department to impose particular actions. Some disadvantages include poor accident response and no prior warning of accident-prone zones. In addition, the rate of casualties is significant.

When a user of the program is involved in an accident, we offer an application that sends an alert to emergency contacts, the nearest police station, and the nearby hospitals. The proposed system has the advantages of a faster reaction to incidents and the potential to save many lives.

III. LITERATURE SURVEY

According to previous works, accidents are human misfortune which result in significant human difficulty as well as budgetary expenses in the form of premature deaths, traumas, and lost potential revenue. A lot of effort has gone into lowering the number of people who die in car accidents.

According to Bankar Sanket Anil, et al. [1], there are many innovative strategies to avoid accidents, such as Anti Lock Braking System (ABS), Adaptive Cruise Control (ACC), and Anti Collision System (ACS), however despite this, a substantial percentage of accidents occur. His efforts led to the creation of a system that outlined a strategy for providing medical aid and other services as soon as an accident occurs. A flex sensor and an accelerometer can be used to detect accidents, and the locality of the accident will be sent to the appropriate members, such as the closest medical agencies, police, and the vehicle owner, via SMS will be activated and sent using a GSM modem and the coordinates obtained from

GPS as well as the time of the accident and the vehicle number will be included. Inside the vehicle, a camera lens will broadcast current-time video to allow passengers to monitor the present condition. As a result, the focus of our work is on the post occurring accident system for recognizing and notifying about the accident. In this paper, the simulation results on the hyper terminal are also reported.

New communication technology integrated into current automobiles, according to R Sujitha, et al. [2], provide improved help to persons injured in traffic accidents. In Recent research, she have shown how hybrid communication skills should be fostered and improved the whole liberation

procedure. She added that there was a necessitate for a system She added that there was a need for a system that could recognize and classify the seriousness of accidents using the KDD method across a variety of disciplines.

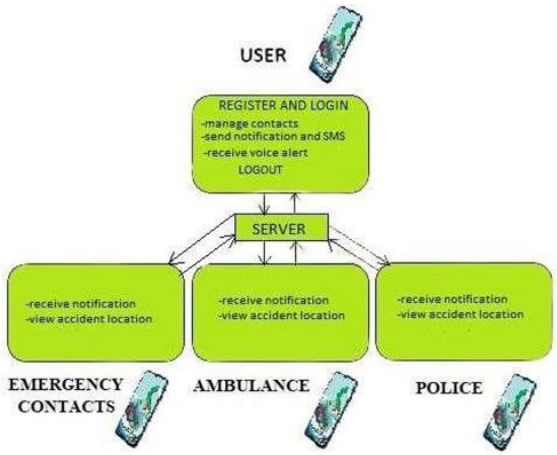
Embedded systems are used to consider the most relevant characteristics that can characterize the severity of the accidents in her research. She employs a number of wireless networking tools, including the Global Positioning System (GPS) and ZigBee. The location of the car is ascertained through GPS. In this work, a report is created based on vehicle movement and is meant to be taken by rescue centers. There is an option for alarm messages to be terminated by the driver or any other close individuals using a switch in order to avoid sending the message to control and spare the important time of the medical rescue team. If a minor accident has occurred or if there is no major danger to anyone's life, cancellation of arriving rescue team can be minimized. Contribution of [2] is to enhance the overall rescue procedure, provide emergency services with precise information as quickly as feasible, and save valuable human lives through quick and accurate accident severity evaluation. The technology indicated in [3] primary benefit is that it offers instant hospital, police, and location chasing for accident sites. According to [4], despite many efforts taken by different organizations all around the world by various programs to warn against careless driving, accidents have taken place every day. If the emergency service centers had been alerted to the incident and provided the required support right away, many lives might have been saved.

IV. WORKING METHOD OF APPLICATION

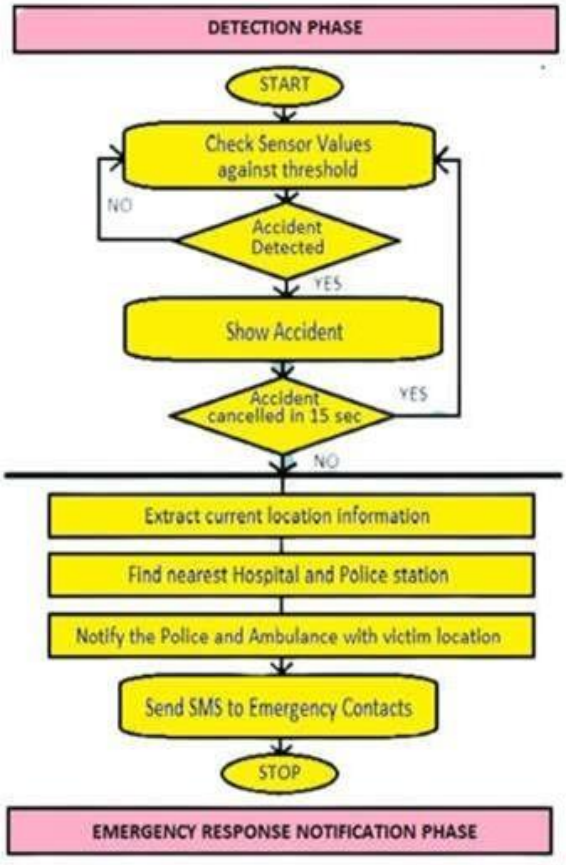
The system requirements are exactly as stated. i3 Processor, 8GB RAM, 100GB Hard Disk, 2.4 GHz+ Speed, Android Mobile, Android 11 App Version, GPS model to gain real location are the minimum hardware requirements. Windows 10 or higher, Java coding language, JDK 1.8 or higher Java software, SDK Android software, and Android Studio Tool are the software prerequisites. Android Studio, Eclipse, JSP, JAVA, and GPS are the tools and technologies used.

The application's four modules are identified in System Planning. User, Ambulance, Police, and Emergency contacts are among the modules available. They each have a specific role to perform in the application's operation They each have a specific role to perform in the application's operation. The User will be Logging onto the app, then handling the ambulance and cops, and finally logging out. The user notifies the ambulance module, which defines the ambulance driver's role. Similarly to an ambulance driver, the police and emergency contacts module has identical work.

V. SYSTEM DESIGN AND IMPLEMENTATION



The main server consists of User, Police, Ambulance and emergency contacts are shown in Figure 1. Only the User will be logging on to it. The main server has been grabbed. The emergency contacts' attention will be beneficial in accepting and processing requests from users. As seen in figure 1, The operations and actions will arise in every individual's environment. The application's process is depicted in Figure 2.



Initially, there is an accident detection phase, in which a mobile phone detects the sensor value against a threshold value when it falls and voice alert will be initiated. If the sensor reading exceeds the threshold, the victim receives an accident alert. If a person ends the alarm within particular time frame then it is considered as no serious injuries have come off, and the next phase, Emergency Response will commence. Following that, the current position of the accident is extracted, because the user's location will be updated at regular intervals. In addition to the accident site, the nearest hospital and police station are also located. The ambulance driver, as well as the police, are notified about the collision. The family members whose contact information was entered by users when they signed up for the Accident Detection System application [5] will also get notified. The information will be displayed in the notice or SMS along with the victim's name, message will be sent. The person would then be saved with the aid of an ambulance driver, a police officer, or a family member, whomever is the first to arrive, after hearing this information. The application automatically sends emergency notifications to the police, ambulance, and emergency contacts, eliminating the drawbacks of the manual system.

VI. TESTING AND RESULTS

This application is intended to detect falls while also being as simple to use as feasible. People who are unfamiliar with Android phones will be able to utilise the software as well. To accomplish this, the amount of buttons and options available to the user is significantly limited. On the main screen, there are only a few buttons and labels. The button turns on and off the autumn monitor, and the label shows the current state. A service allows the fall monitor to run in the background, assisting in the detection of the fall. Users who have previously registered with the application will be able to log in. A pop-up message or notification is provided to the user when the monitor or the smart sensor suspects a fall, as seen in figure 4. This wakes up the program and tries to attract the user's attention by playing an audio message frequently, forcing the user to answer immediately. If the user is acceptable, the program will prompt them with a simple pop-up box that instructs them to touch an on-screen button. The alarm is cancelled and the paused activity is resumed when the button is pressed. This allows users to avoid sending any false alerts to police officers or ambulance drivers [7]. As a result, the arrival of an ambulance and police officers at the

scene of the accident will not be necessary. Every contact on the emergency list, surrounding police stations, and nearby hospitals receive an SMS message when a fall is confirmed[6]. This notification includes the GPS coordinates of the accident and specifies that a fall was detected at the specified time. Only when the fall is confirmed are the specialist emergency services available, allowing us to save time.

SNAPSHOTS

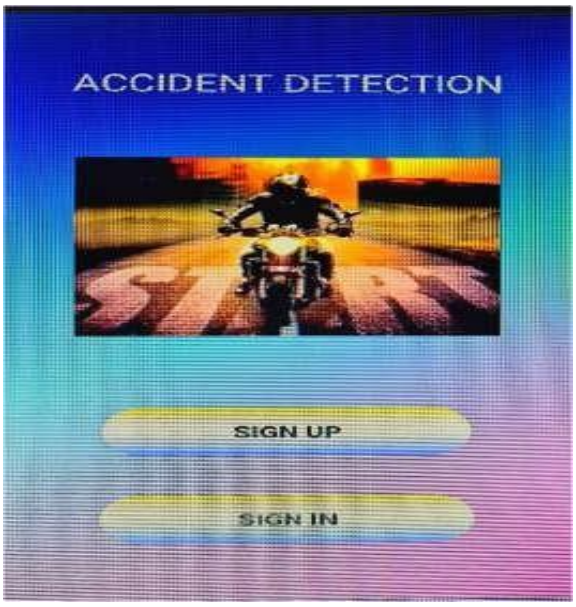


Fig: Home Page

Fig: Detecting the fall

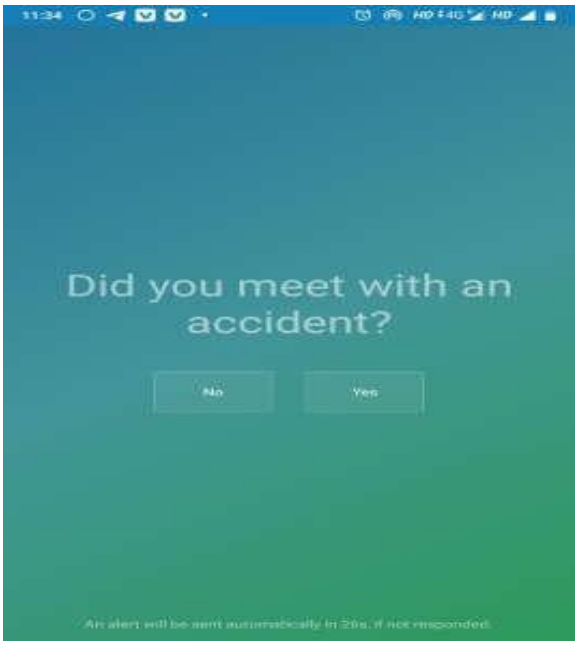


Fig: voice alert notification

Fig: Notification to Contacts

VII.CONCLUSION AND FUTURE WORK

The accident detection system is presented in this work. This system is made up of two parts: a web

portion and an android component. Web components are frequently implemented using JSP (Java Server Pages). Because it is simple, object- oriented, safe, platform agnostic, resilient, portable, dynamic, interpreted, multi-threaded, and other benefits, Java is used to construct Android applications. The web portion is used by the user. Only users are able to access the website. Police officers, ambulance drivers, and emergency contacts all use the Android software. Drivers of ambulances and police officers may also sign up and use the programme. This exemplifies the app's wide range of applications for accident detection. Numerous techniques are being employed to generate a more precise outcome and minimize errors as much as possible, and the amount of research being done on this topic is always expanding. Many people's lives are saved as a result of this application. As a result, we are confident that this project will assist the publicin remaining safe and saving lives. A camera and microphone hardware can be added to this programme to improve it. The camera will capture accident view in this application. This will also become a major witness of the accident. Audio can also be recorded surrounding the location using the microphone. As a result, the victims receive justice by presenting the appropriate proof in court. Pedestrians who observe mishaps can rescue many number of lives by sending message alert to particular rescue agencies which plays major role in our application. Typically, people will be hesitant to be a part of witness because there will be complications if they get trapped in to it. As a result, we can have an anonymous message transmitted to police from pedestrians. As a result, this method would result in a more efficient application.

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