Auto Accident Detection and Alert System

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ABSTRACT: Street mischances rates are high these days, particularly bikes. Auspicious restorative guide can help in sparing lives. This framework intends to alarm the adjacent therapeutic focus about the mishap to give prompt restorative guide. We propose to develop an application which will detect accident using the sensors present in android cellular phone. Our proposed system consists of two phases; the detection phase which is used to detect car accident with location and the notification phase which will notify the respondents or rescue team. Application likewise shares the correct area of the mishap that can spare the time.

KEYWORDS: HELP ME button, Android cellular phone, Emergency situation, Notifications.

I. INTRODUCTION

The engine vehicle populace is developing at a quicker rate than the financial and populace development. Mischances and the demise rate because of street mishaps, particularly bikes are likewise expanding at a disturbing rate. A large portion of the mischance passing's that happens are because of the absence of quick therapeutic help, on the streets like express expressways. An office for giving prompt medicinal help to the mishap region can decrease the casualty to a more noteworthy expand. In this way comes the thought of a ready framework that detects the mischance and its reality to alarm the close-by therapeutic community for giving emergency vehicle or restorative guide to the mischance zone.In Our Life, many a people die from traffic accidents. A perfect and effective way for reducing traffic accidents hazards is to minimize the time between when an accident occurs and when rescue reacts. We propose to develop an application which will detect accident using the sensors present in android cellular phone. Our proposed system consists of two phases; the detection phase which is used to detect car accident with location and the notification phase which will notify the respondents or rescue team. We will also add an "HELP ME" soft button, will be used in the emergency situation else than accident (like stuck in bad circumstances or having an attack of medical disease etc.) in case of using this button a predefined massage will be sent to appropriate responder.

a. **Objective**
- Detect Accident Automatically.
- Fetch the location of incident.
- Encapsulate the informal message and current location coordinates of GPS in SMS.
- And that SMS will be sent to proper responders/family.
- Emergency alert manuallyby pressing a button instantly.
- User will press "HELP-ME" button and it will encapsulate the informal message and current location coordinates of GPS in SMS and will be sent to family.

II. EXISTING SYSTEM

Actually there is no system like this in our country right now, so there would be no proper comparison of existing system and present one. Although there are many applications developed by foreign developers.

a. Reasons of failure of existing systems:
1. Not better GUI.
2. Not supported to all android smartphones.
3. There is no app that having dual detections of G-Value and Acceleration.
4. Not having support of multi levels of detection 5. User is not guided properly.
5. More false alarm possibilities.
6. No false alarm handler included.
7. Applications do not run when user locks phone.

b. Reasons of choosing our application:
1. A good and simple GUI.
2. Less false alarm possibility.
3. Timer included if this is false alarm user can disable it by pressing "I'm safe" button within countdown time.
4. Proper guidance for user.
5. Dual detections by G-Value and Acceleration.
6. Can support all android phones (exceptional cases can occur).
7. Multi-type sensor support.
8. Detection can run even phone is locked.
9. Timer activity can show upon lock screen.
10. Phone automatically lock is including in application

i. Product Features

Our app is designed to overcome the danger of deaths in accident only because of no rescue or help and second purpose is to give a fast way to alert our family of any emergency situation we got into. So app automatically detects accidents and send a message to the responders for that person.

Main features are:

➤ Provides two modes manual and auto-detection.
➤ Manually user can send an alert message with his current location only by pressing a
   Button.
➤ Automatically detects a collision/crash of a car.
➤ Send message to three phone numbers with user's current location.

ii. Operating Environment

The designed application can run on all the android devices. It supports from android KitKat to onward. Application can run on all custom GUIs developed by mobile branding companies like samsung, huawei etc. It also run smoothly on stock android devices like google nexus and others.

iii. Design and Implementation Constraints

Interface of the application is designed in Android studio using XML (Extensible Markup Language). Android studio is an IDE (Integrated development environment) suggested by Google itself for android development. And back-end developing language is used for application is JAVA. All coding is done in android studio. Designing elements e.g buttons are created and adobe photoshop and used in app using drawables in android studio.

iv. **Assumptions and Dependencies**
   a. **Dependencies:**
   - Proper GPS
   - This application is totally dependent on presence of accelerometer.
   - KitKat and newer than KitKat android OS needed.
   - Only run in android devices licensed by Google.
   - Mobile should be properly functioning (Not damaged or stopped working etc.)
   b. **Assumptions:**
   - All type of android custom operating systems can run it e.gsamsung'sTouchWiz.
   - GPS is present on almost all devices.
   - Users are more adaptive now a days.

v. **Permissions**

Every android app uses permissions from user to perform its tasks and operations. If user does not accept the permissions then application could not be installed or work properly. My app uses some of permissions:

- Current location (By GPS)
- Send SMS
- Mobile vibration
- Audio settings
- Access system location settings
- Wake Lock (To keep mobile awake)

III. SCOPE OF PROJECT

The rapid advancements in the area of mobile applications development and the popularity of android have encouraged the provision of utility applications. So the major objectives of our application to detect the accident and notify about accident or other emergencies, the algorithm will detect an accident and send a message to responders encapsulated location in it. Actually we have two major phases of Feature one of automatic mode:

- Accident detection.
- Alerting the responders

And we have also an HELP ME button:

- Button pushed by user.
- Alert note sent to responders suddenly

So this is the total scope of our project.

IV. LITERATURE SURVEY

C.Prabha et al.2014 reported in Automatic Vehicle Accident Detection and Messaging System Using GSM and GPS Modem,The Rapid development of innovation and foundation has made our lives simpler. The appearance of innovation has likewise expanded the activity risks and the street mishaps occur as often as possible which causes immense death toll and property as a result of the poor crisis offices. Our venture will give an ideal answer for this disadvantage. An accelerometer can be utilized in an auto caution application with the goal that hazardous driving can be identified. It very well may be utilized as an accident or rollover finder of the vehicle amid and after an accident. With signs from an accelerometer, an extreme mishap can be perceived. As indicated by this venture when a vehicle meets with a mishap instantly Vibration sensor will identify the flag or if an auto moves over, and Micro electro

mechanical framework (MEMS) sensor will recognizes the flag and sends it to ARM controller. Microcontroller sends the alarm message through the GSM MODEM including the area to police control room or a safeguard group. So the police can instantly follow the area through the GPS MODEM, in the wake of getting the data. At that point subsequent to adjusting the area fundamental move will be made. In the event that the individual meets with a little mischance or if there is no genuine risk to anyone`s life, at that point the alarm message can be ended by the driver by a switch gave keeping in mind the end goal to abstain from squandering the significant time of the therapeutic safeguard group. This paper is helpful in distinguishing the mischance unequivocally by methods for both vibration sensor and Micro electro Mechanical framework (MEMS) or accelerometer. As there is an extension for development and as a future usage we can include a remote webcam for catching the pictures which will help in giving driver`s help.

P.Kaliuga Lakshmi et al.2016 reported in AN EFFICIENT VEHICLE ACCIDENT DETECTION USING SENSOR TECHNOLOGY,Total populace has expanded colossally in this time. Some development of innovation and targets of this paper is to distinguish a mischance. It is utilized to help the individual who is enduring in vulnerable condition. In this circumstance there is a need to grow such framework which ought to naturally illuminate to medicinal group. Presently multi day, more passing is going on account of mischances. This paper is utilized to identify the mishap by methods for both vibration and MEMS (Micro Electro Mechanical System) or accelerometer and give crisis offices to street mischances. At the point when a vehicle meets with a mishap quickly vibration sensors identify the flag. MEMS sensor sends the flag to ARM controller. Microcontrollers send the alarm message through GSM modem with area. On the off chance that the individual meets a little mishap, driver can educate consideration isn't required by ending the message utilizing switch. This is to abstain from squandering the season of restorative and police group.

Salas K Jose et al.2016 reported in ARM 7 Based Accident Alert and Vehicle Tracking System,Auto collisions are one of the main sources of fatalities. An essential marker of survival rates after a mishap is the time between the mischance and when crisis therapeutic work force are dispatched to the mishap area. By wiping out the time between when a mishap happens and when the people on call are dispatched to the scene diminishes death rates, we can spare lives. One way to deal with disposing of the postponement between mischance event and person on call dispatch is to use in-vehicle programmed mishap location and notice frameworks, which sense when an auto collision is probably going to happen and quickly tell crisis happened. These in-vehicle frameworks, be that as it may, are not accessible in all autos and are exorbitant to retrofit in more seasoned vehicles. In this paper, such a framework is depicted the principle utilization of which is early mishap discovery. It can naturally identify car crashes utilizing accelerometers and quickly advise a focal crisis dispatch server after a mischance, utilizing GPS organizes. Alongside the information it will send the quantity of the vehicle as well. This paper gives the accompanying commitments to identifying car crashes through ARM7 controller. Here it is perceived how arm controller, accelerometer, GSM associations, and GPS can be utilized to give situational mindfulness responders. The codes are composed and aggregated in Keil ARMIDE.

VarshaGoud,et al.2012, The Rapid development of innovation and framework has made our lives simpler. The approach of innovation has additionally expanded the movement risks and the street mischance occur oftentimes which causes gigantic death toll and property in light of the poor crisis offices. Our venture will give an ideal answer for this disadvantage. An accelerometer can be utilized in an auto alert application with the goal that unsafe driving can be recognized. It very well may be utilized as an accident or rollover finder of the vehicle amid and after an accident. With signals from an accelerometer, a serious mishap can be perceived. As indicated by this undertaking when a vehicle meets with a mishap promptly Vibration sensor will identify the flag or if an auto moves over, and Micro electro mechanical framework (MEMS) sensor will identifies the flag and sends it to ARM controller. Microcontroller sends the alarm message through the GSM MODEM including the area to police control room or a save group. So the police can promptly follow the area through the GPS MODEM, in the wake of getting the data. At that point in the wake of acclimating the area fundamental move will be made. On the off chance that the individual meets with a little mischance or if there is no genuine risk to anyone`s life, at that point the alarm message can be ended by the driver by a switch gave keeping in mind the end goal to abstain from squandering the important time of the therapeutic protect group. This paper is helpful in identifying the mischance accurately by methods for both vibration sensor and Micro electro Mechanical framework (MEMS) or accelerometer. As there is a degree for development and as a future usage we can include a remote webcam for catching the pictures which will help in giving driver`s help.

Nicky Kattukkaran,,et al.2018. Street mischances rates are high these days, particularly bikes. Convenient medicinal guide can help in sparing lives. This framework intends to alarm the close-by therapeutic focus about the mishap to give prompt restorative guide. The connected accelerometer in the vehicle detects the tilt of the vehicle and the heartbeat sensor on the client's body detects the variation from the norm of the heartbeat to comprehend the earnestness of the mishap. In this manner the frameworks will settle on the choice and sends the data to the cell phone, associated with the accelerometer and heartbeat sensor, through Bluetooth. The Android application in the cell phone will sent instant message to the closest restorative focus and companions. Application likewise shares the correct area of the mischance that can spare the time.

Hemangi S, et al.2018. In this paper, we proposed a framework to identify vehicle mischance and caution to the relative and in addition adjacent police control rooms and clinics. The quantities of mischances occurring in our nation are expanding quickly ordinary and existing frameworks for a man who meets with a mischance are frail according to the proportion. Likewise the current frameworks are concentrating generally on avoidance of mischance as opposed to taking quick activities after a mishap; with the goal that the individual could be spare. The point of the venture is to identify the street mischances and to give quick help to poor which stays away from the loss of important human life. Catchphrases: RF transmitter and collector, LCD, Atmega 328 Microcontroller, Vibration Sensor, Regulator GSM module.

V. FUNCTIONAL REQUIREMENTS

i. Auto detection Mode:

Identifier	Auto detection mode	
Purpose	Automatically detect accident and send an alert sms	
Priority	High	
Pre-conditions	Turn on auto detection mode	
Post-conditions	On detection of accident , alert sms will send.	
Typical Course of Action		
S#	**Actor Action**	**System Response**
		System will show manual and auto
2	User turn on auto detection mode	System will show detection level choice
		System will show the detection screen
		System detects accident and send sms

Table 1: UC-1

ii.   **Adding emergency Contacts**

Identifier	Saving Contacts in database
Purpose	To send an alert sms
Priority	High
Pre-conditions	Run application
Post-conditions	To choose auto detection or manually alert

Typical Course of Action		
S#	**Actor Action**	**System Response**
1	Add or update contacts.	System will show contact screen
2	User will add atleast one contact	System show the added contacts
		System will save the contacts and

Alternate Course of Action		
S#	**Actor Action**	**System Response**
1		
2		
3		
...		

Table 2: UC-2

iii.   **Manually send alert sms**

Identifier	Manual alert
Purpose	Manually send alert sms to saved contacts
Priority	Medium
Pre-conditions	Conatact should be saved and GPS should be turn on.
Post-conditions	Send alert sms by pressing **Help Me** button.

Typical Course of Action		
S#	**Actor Action**	**System Response**
		System will show manual and auto
	———	System will send alert sms to saved

Alternate Course of Action		
S#	**Actor Action**	**System Response**
1		
2		
3		
...		

Table 3: UC-3

VI. NONFUNCTIONAL REQUIREMENTS

i.   **Performance Requirements**

The designed application will respond every user that will access the application, the access time depends on the speed of GPS of the user and it depends on availabilty of acceleremeter sensor.

- Simple interface leads to error free access to the application
- Excellent performance of app on all supported android platforms.

ii.   **Safety Requirements**

- The designed application will not use contacts for any other use
- App will not do anything without user's permission

iii. Security Requirements
- The designed application will not use credentials of the user for any other purpose.
- Application will not provide access unauthorized system resources.

iv. Software Quality Attributes
- The designed application must be efficient enough to use the system resource efficiently.
- This application will not disturb any other process on platform when it is running.
- This application will access the data with the permission of User it will not access any other information of the user.
- The application has the capacity of reusability.

VII. METHODOLOGY
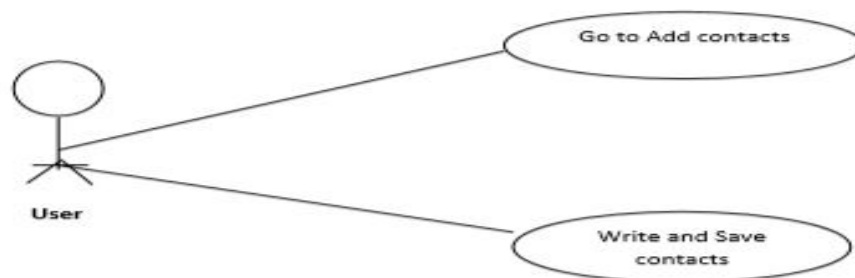
i. Use Cases:

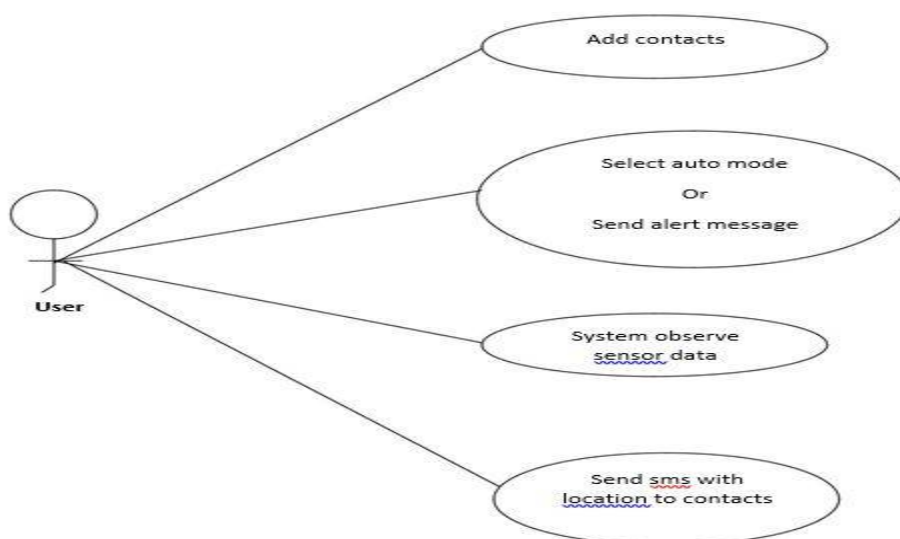Figure 1: Use Case for Contacts

Figure 2: Use case for overall system

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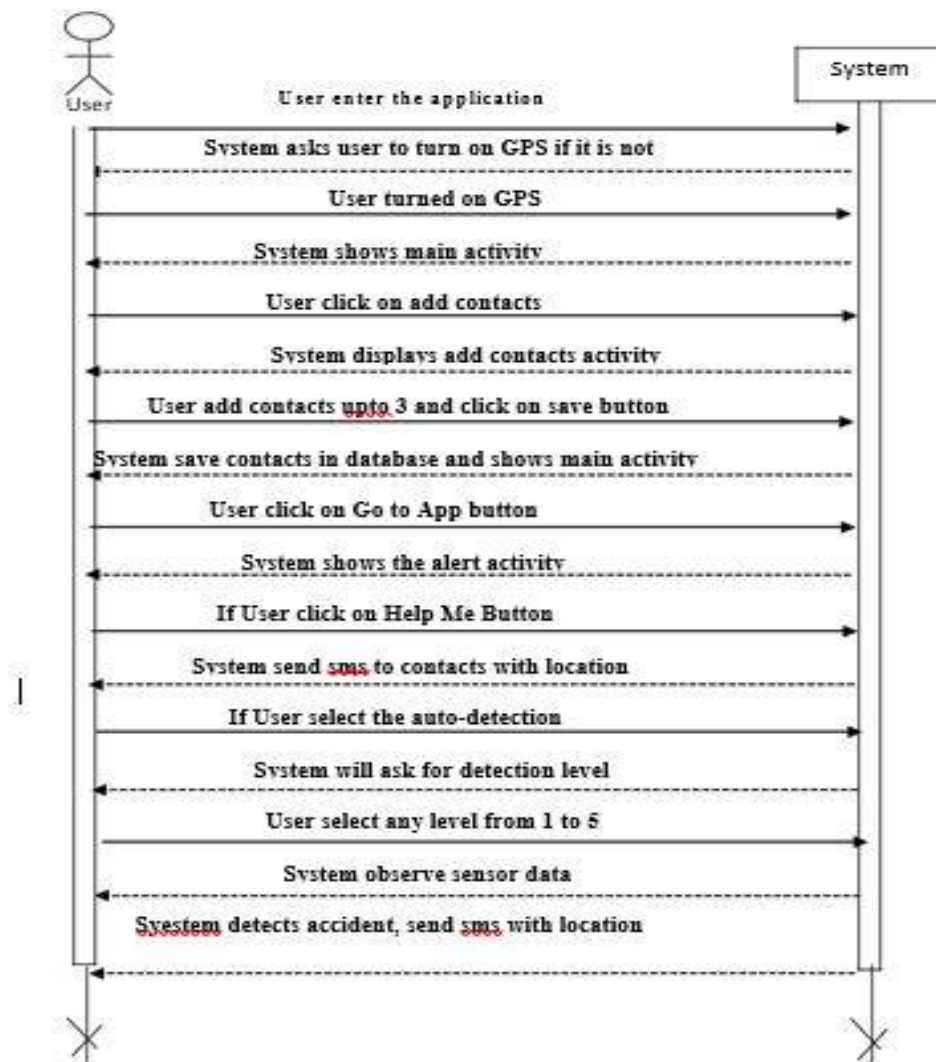
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ii. **Sequence Diagram:**

Figure 3: Sequence Diagram for overall system

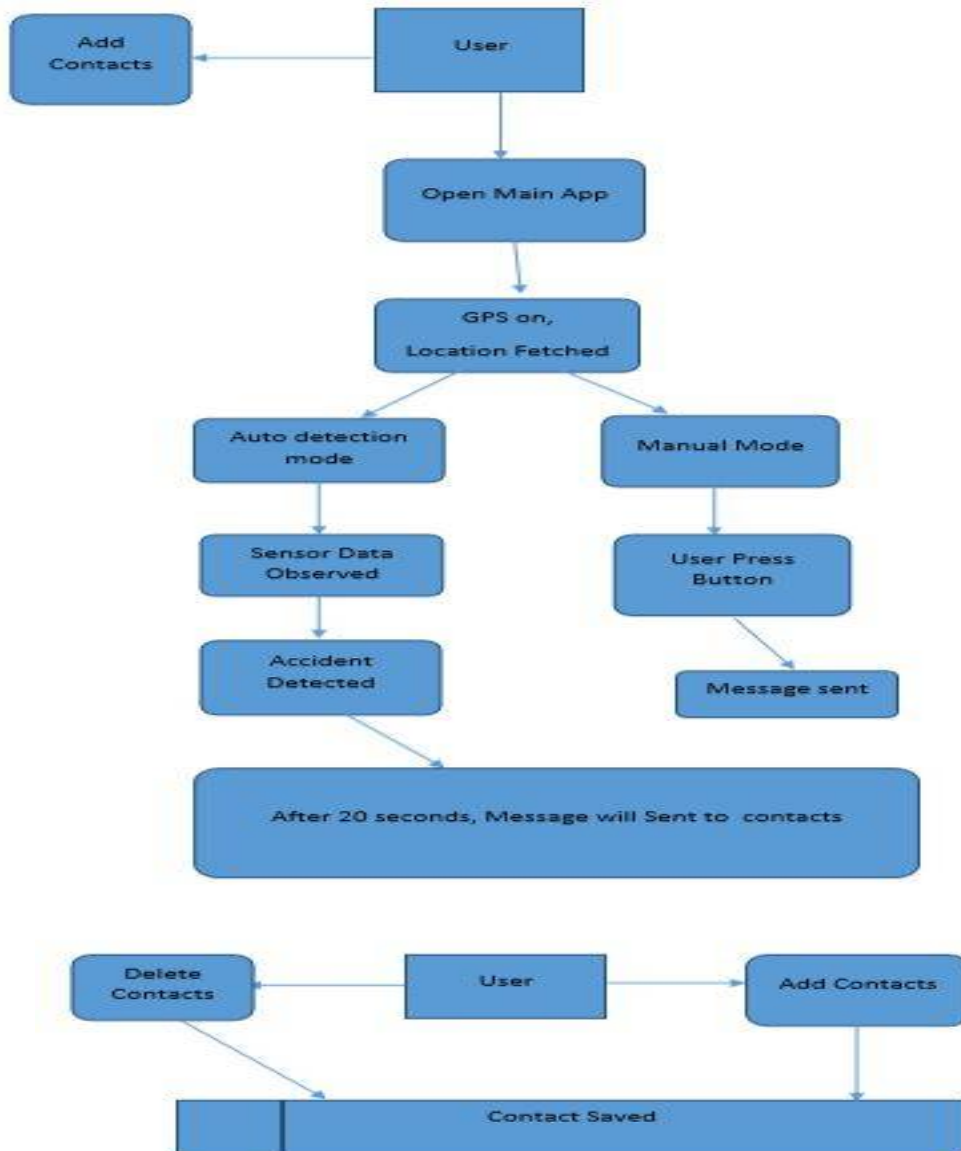iii.   **Data flow diagram (DFD)**

Figure 4:Data flow diagram

VIII. CONCLUSION

This task presents mischance identification and ready framework with SMS to the client characterized versatile numbers. The GPS following and GSM alarm based calculation is composed. The proposed mishap identification framework can track geological data naturally and sends a ready SMS with respect to mischance. The outcome demonstrates that higher affectability and exactness is undoubtedly accomplished utilizing this undertaking. EEPROM is interfaced to store the portable numbers for all time. This made the venture easier to understand and solid. The proposed technique is checked to be very useful for the automotive industry.

IX. RESULTS

Figure 5:Splash Screen

Figure 6:Main Screen

Figure 7:Contact Screen

Figure 8:Tutorial.

Figure 9:Auto accident detection mode.

Figure 10:Auto detection mode enabled.

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BIOGRAPHY

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