"LifeLine" the aid in emergency

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Abstract: In this world of welfare and sanity which we wish for, there is also some evil present in society. Mishaps or accidents are also becoming more frequent with an increase in the number of objects. The mishaps and the evil minds together give rise to the situation known as Emergency. Even if we have multiple ways of calling for help and services in times of emergency, they still take some time, either from the user or from the system to establish communication. Hence, we present to you, the LifeLine. With just one click in times of emergency, you call for help on multiple services as well as many of your relatives.

Keywords: distress, emergency, immediate action, one click.

1. INTRODUCTION

1.1 BACKGROUND

Many elderly people go out for a walk nowadays. They suddenly face issues like chest pain, sudden heart strain, and many more. Even a common man like us faces sudden emergencies like some medical emergencies and all. A person is stuck inside while the place has caught fire.

There are many similar situations of emergency one can face. And a common point in all these situations is that the person stuck in an emergency doesn't have either the freedom or the time to get the phone either out of pocket or pick from someplace and place the emergency call or contact his family members.

1.2 PROBLEM STATEMENT

Therefore, we wished to make a system which will do all this stuff for you just at the cost of one click. Hence, we came up with the impressive "LifeLine". This system called "LifeLine" would use GPS and GSM modules in coordination to call for help without you doing much interaction.

We want to develop a system that'll help a person contact multiple help supports without doing much work. Their stress of calling for help shall be reduced so that they can focus more on saving their own and loved one's lives.

1.3 RELEVANCE

The integration of GSM and GPS modules with Arduino in the LifeLine offers significant relevance in various contexts. These bands enhance personal safety by enabling distress signals with precise location information to be transmitted during emergencies, benefiting vulnerable individuals such as the elderly, children, and those with medical conditions. In outdoor activities, LifeLine aids in quick location tracking and rescue operations, reducing response times and potential risks. For security services, these bands provide an additional safety measure, allowing immediate communication of distress signals and location details. LifeLine integrated into vehicles enhances safety and facilitates prompt recovery in cases of accidents, breakdowns, or thefts. In disaster management, LifeLine assists search and rescue efforts by transmitting location information, enabling timely assistance to affected individuals. The flexibility of Arduino allows customization and integration with various sensors, further enhancing the functionality and relevance of LifeLine. Consideration of local regulations and network availability ensures practical implementation of these bands.

2. LITERATURE REVIEW

2.1 DIFFERENT PAPERS STUDIED

1. The First paper that we studied provides a method for self-driving cars to navigate through emergencies in a timely and safe manner. This is accomplished by employing elastic bands to plot a path that avoids sudden turns and considers how the car moves.

2. The second paper, proposes an IoT device and Android app that can enhance women's safety by

tracking their real-time location, sending it to the nearest police box and volunteer, and providing the location of the nearest safe zone. It works in hybrid mode.

3. The third paper proposed a wearable device that senses an increase in pulse rate due to harassment and alerts the nearest police station and emergency contacts for a swift response, increasing women's safety.

4. The fourth paper proposed a "watch me" system using smartwatches can detect heart rate changes during a potential attack and automatically call registered contacts and nearby police stations via GPS/GSM. This provides a safer environment for women and children, but no information is given on the system's accuracy or reliability in real-world scenarios.

In the fifth paper, The article proposes a model for situational awareness and decision-making in Air Force operations, exploring techniques and technologies for improving awareness in different application domains.

2.2 GSM MODULE

A GSM module is a compact electronic device that enables wireless communication over GSM networks. It incorporates a GSM modem with a SIM card slot for network authentication. The module supports multiple frequency bands, ensuring compatibility across different regions. It interfaces with microcontrollers or embedded systems through standard communication protocols like UART. GSM modules offer additional features such as GPRS for internet connectivity, TCP/IP stack for data transmission, and AT commands for configuration. With their compact size, low power consumption, and reliability, GSM modules are widely used in telecommunications, IoT, and embedded systems. They are found in various applications including vehicle tracking, smart meters, home automation, and remote monitoring. Overall, GSM modules play a vital role in facilitating wireless connectivity and data transmission, driving innovation in our interconnected world.

2.3 GPS MODULE

In summary, a GPS module is a compact electronic device that utilizes satellite signals to accurately determine the location of an object or person. It integrates a GPS receiver to calculate latitude, longitude, and altitude. GPS modules are versatile, easily integrated into systems using standard protocols, and offer additional features like tracking movement, speed, time synchronization, and advanced navigation capabilities. They provide high accuracy and reliability for automotive, fleet management, outdoor recreational, and personal navigation applications. GPS modules are also integral to smartphones, enabling location-based services and geotagging. The NEO-6M GPS module uses the NMEA protocol for communication, with NMEA sentences providing standardized data strings for latitude, longitude, speed, and satellite information. Decoding NMEA sentences involves extracting relevant data fields, checking for errors, and utilizing the information for navigation, tracking, and mapping applications. Overall, GPS modules play a crucial role in precise positioning and navigation in today's world.

3. METHODOLOGY

3.1 EXISTING SYSTEM

In the current system, if any emergency occurs, the person, whomsoever is concerned has to pick up his cell phone, dial an emergency number (911 for America, 112 for India etc.) and then describe his situation to the care center. There are quite a few findings about the current system.

Advantages:

1. The person can describe clearly what the emergency is to the support system.
2. The person can also explain his exact location.

Disadvantages:

1. In the current system, it is not assured whether the person has his cell phone and can place a call.
2. The system is also uncertain about the person's position and ability to speak.
3. The person can only call for help to one service (national emergency contact, fire, ambulance).
4. If the person is moving and not stationary, there is no way to track and trace him down or predict his movements.

3.2 PROPOSED SYSTEM:

As you know these days safety is a big concern to worry about. This safety band can provide you with some safety. The safety band we described, incorporates a GPS module, GSM module and

Arduino uno. The proposed Smart Safety Band System aims to enhance women's safety by providing them with a wearable device that incorporates various features for personal security and emergency assistance.

When the user will turn on the device. The band will check whether the emergency switch has been pressed ones or twice. If it is pressed The Arduino Uno, connected to the GPS module, retrieves the location data provided by the GPS module. It extracts the latitude and longitude coordinates, which represent the wearer's current position then The GSM module allows communication over the cellular network. It can send and receive SMS messages and make phone calls, and emergency SMS will be sent immediately to the nearest police box, volunteers and her family. The location update will be done by the GSM module. To ensure optimal power management, the Arduino Uno can implement sleep modes to conserve energy when not actively processing data. It should also monitor the battery level and send alerts if the battery is running low, indicating the need for recharging. The safety band should have a user interface, which can be a simple display or LEDs, to provide information to the wearer, such as battery status, GPS signal strength, and emergency status.

Further the safety can increase to--

• Voice Activation and Voice Commands: Integrating voice activation and voice commands into the safety band allows users to initiate emergency alerts or perform specific actions hands-free. This can be particularly useful in situations where the user may be unable to manually operate the device, such as when hands are restrained or injured.

• Audio and Video Recording: The safety band can include built-in microphones and cameras to capture audio and video evidence in emergency situations. This feature can help gather valuable information for investigations or provide additional security for the wearer.

• Integration with Mobile Apps and Smart Home Devices: The safety band can be designed to integrate with mobile applications or smart home devices, allowing users to manage safety settings, receive notifications, and connect with other smart devices for enhanced security and automation.

3.3 USED MODULES

1. Arduino UNO

Arduino uno is a microcontroller that is mostly used to interface multiple sensors or other modules with each other. It can detect different activities like buttons pressed etc., take smart decisions using embedded C programming, and it can send data to other modules that'll do different functions based on passed data.

2. Push Buttons

Push Buttons are a component that tags along with an Arduino development board. It is an important component of the project, that would help the person needing help to place a call, just with one click.

3. GSM module

Global System for Mobile Communication known as GSM module.

4. EARLY DEVELOPMENT STAGES

4.1 APP DEVELOPMENT

In the early development stages, we were thinking about developing an app to co-ordinate the activities of the LifeLine. But researching further, we realized that the app cannot be downloaded by every user, as we cannot force each user to download the app when buying a LifeLine.

4.2 MULTIPLE CLICKS

We were also thinking of implementing the multi-click detection in a single button so as to call for distinct types of help. But some elderly people, due to memory problems might not be able to remember the correct number of clicks for calling a certain help. This brought us to the conclusion that it is a need and a HMI solution to have three different buttons for the different emergency.
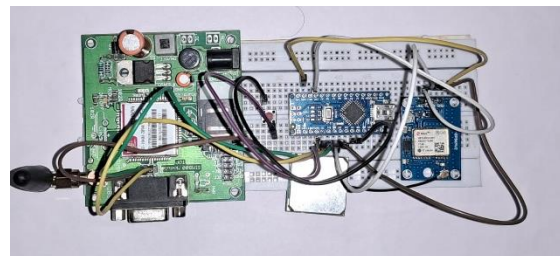
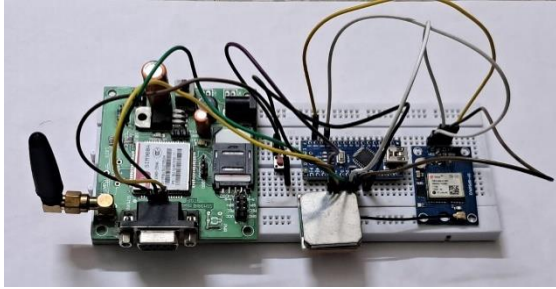## 5. SIMULATIONS

Figure 5-1 top view of model

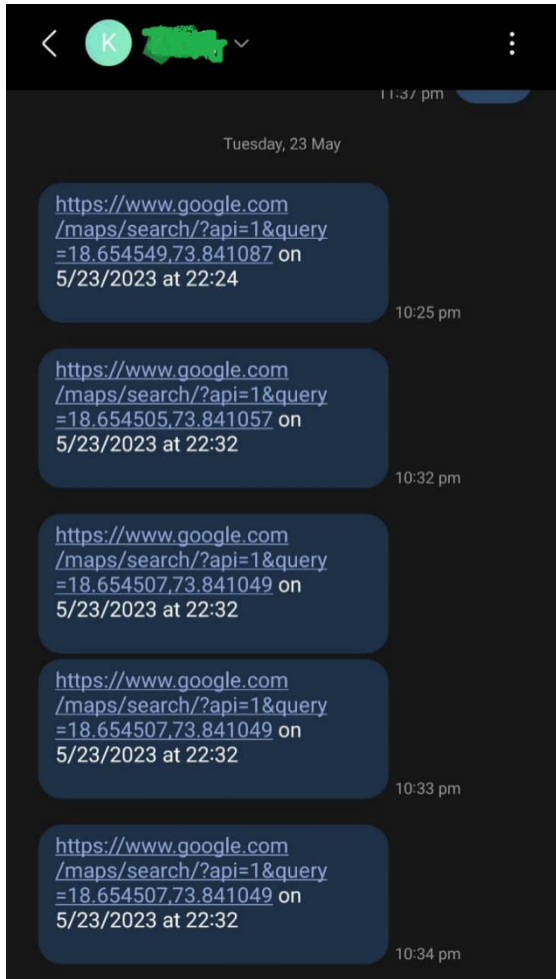*Figure 5-2 side view of model*

Figure 5-3 screenshots of the SMS received

6.   RESULT AND DISCUSSION

This LifeLine will prove to be useful in many real life situations. Many will benefit from it. It's prime function of location sharing helps tackle various problems. The hassle of taking out the phone, unlocking it and then proceeding to call is eliminated. Even this small amount of time can turn out to be crucial at times during emergency.

Although the setup is quite bulky, with the right budget and equipment it can be integrated into a band. The spontaneity of response and accuracy can also be increased.

7.   CONCLUSION

This research paper describes the development of a device that combines GSM and GPS modules to establish a reliable emergency communication system. The device allows individuals in emergency situations to call for help and share their location automatically. The GSM module enables direct communication with emergency services or designated contacts, while the GPS module ensures accurate location tracking for prompt response. Simulated emergency scenarios validated the device's effectiveness and practicality, demonstrating successful emergency calls and real-time location sharing.

The implications of this research are significant, as the integrated GSM and GPS technologies offer a comprehensive solution for immediate communication and location sharing during emergencies. This can assist to faster response times and possibly save lives. Future improvements may involve adding features like biometric sensors or health monitoring capabilities and integrating the device with existing emergency services infrastructure. Field trials and user studies in real-life emergency scenarios would provide valuable insights for further refinement and optimization.

In conclusion, this research paper presents a device that combines GSM and GPS modules to create a reliable emergency communication system. It has the potential to enhance emergency response systems and improve the safety of individuals in critical situations by enabling effective communication and accurate location tracking.

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