Voice-Activated Emergency Tracking Gadget for Women

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Abstract- Over the last few years, the standing of women in India has shifted dramatically. However, women continue to face social problems and are frequently victims of abuse and violent crimes. India, which envisions itself as a future superpower and economic centre, is still enslaved by patriarchal sins such as molestations, dowry, violence against women, and the worst of all, rape. Women's safety has become a huge issue in today's world, as they are afraid of physical/sexual abuse and are unable to leave their homes at any moment. Every day, tens of thousands of women are physically abused. The goal of this project is to create a self-defense system that is specifically designed for women to defend them against physical harassment in today's world. The module will include a variety of features and capabilities, such as transmitting the position of a distress victim to a predetermined number as soon as the sensor is pushed or when someone speaks into the voice sensor. The position data obtained from the GPS is promptly communicated to the authorised numbers via GSM modem. The model would include a controller with a GSM/GPS kit that would be connected to all of the sensors listed above. The system would be activated by a human action. An alarm message is delivered to a predefined Mobile Station, along with the location.

Indexed Terms- Internet of Things, Arduino, Women's Security, Voice Activation, GPS.

I. INTRODUCTION

Women and children's safety has become a huge issue in today's world, since they are unable to leave their homes at any moment owing to physical/sexual abuse and the fear of violence like kidnap. Even in the twenty-first century, when technology is continuously evolving and new gadgets are being invented, these individuals continue to face difficulties. The inspiration for this device stems from the growing demand for protection for children and women in today's world, when physical harassment is a possibility. The individual's location will be immediately transmitted to family members via GSM modem as SMS when the emergency switch is activated. Various technologies, such as the Global Positioning System (GPS), and traditional cellular networks, such as the Global System for Mobile Communications, are used to run the system (GSM). In this case, though, GPS is more effective and precise. In terms of tracking in India, its use and market are likely to grow in the coming years.

II. LITERATURE SURVEY

Jakuryamaekawa in [1] suggested a technique for determining a user's current location preference using the user's coordinate point, in which the user's location information is exposed to external providers notwithstanding the user's wishes. To determine a user's location privacy preference, a local Wi-Fi network is employed. This saves electricity while also protecting a user's privacy. The drawback is that Wi-Fi will not be available everywhere and will be limited in terms of space.

HasmahMansor in [2] described a method for detecting body temperature via a Remote Health Monitoring System. Body temperature and heart rate are measured using a device temperature sensor and a wireless sensor. Using XBee wireless connection, the temperature sensors will relay their readings to a microcontroller. Wireless local area network (WLAN) was utilised to transfer real-time data to the health monitoring database. For this, an Arduino with an Ethernet shield based on the IEEE 802.11 standard was used. The real-time temperature readings were effectively monitored locally (at home) and remotely (at the doctor's computer), and the readings were comparable to those of a commercial thermometer, according to test findings from a group of volunteers.

B. Vijayalakshmi in [3] proposed a system to improve women's safety by incorporating GPS and a gsm model. A compact gadget containing a buzzer and a microcontroller has been created, which may be worn on a band or worn on a watch. When confronted with an insecure circumstance, the woman can utilise this device to send an alert SMS to predetermined contacts by pushing the buzzer (5 members). However, this method is unable to send out automatic alert SMS. Instead, in a panic situation, it necessitates human engagement.

Ignore suggested a technique in [4] to determine Detection Of Global And Local Motion Changes At Human Crowds, which could occur in sporting events, functions, and other situations. The association method is used to detect groups based on their location, velocity, and time. People's changes in behaviour can be observed utilising holistic techniques and video surveillance, which are represented in a 2D histogram. However, in a 3D histogram representation, it will not be able to identify motion changes in human crowds.

Rameshkumar. P in [5] described a strategy for leveraging image information to determine the location of humans. Via backdrop information, a device GPS mapper is used to determine a person's location using image and video. It can determine the altitude, longitude, and position of a person who has submitted their photographs to social media with the use of GPS mapper. However, this approach will not be able to generate an image of a person who has not uploaded an image to social media.

Hung Nguyen in [6] designed the ambulatory system, which uses an inertial sensor to observe and detect a person's behaviour in daily life with Parkinson's disease, allowing for early treatment. It will detect the sickness in a short period of time. Observe the disease and administer treatment in a free atmosphere. The device's measurement restrictions will be fixed in objects. If the person's position in relation to the object cannot be predicted.

III. PROPOSED SYSTEM

When the emergency switch is activated through the wearable device automatically, the fundamental concept of the proposed project work is to identify the individual's position and can be relayed to the authorised mobile phone. The microcontroller,

which is utilised to interface with multiple hardware peripherals, is at the centre of the project's operation. A GPS module, a GSM module, an LED, and various sensors as well as an emergency switch, are included in the system. As a result, a GSM modem and GPS receiver are serially connected to an ARM7 microprocessor. The sensor is connected to the ARM controller through ADC pins in order to read the MEMS data from the sensor, which has an in-built ADC. The GPS module gives data on the module's geographic location, and thus the individual's location. The GSM modem is used to transmit SMS messages in the event of an emergency or intruder attack, or when MEMS movements are detected by supplying the individual's geographical position (Latitude and Longitude) from a remote location and activating self-defense devices.

Many parameters are generated by the GPS modem, data is read. The same information is transferred to the mobile phone on the other end, when the individual's location is sought. A switching logic based on transistors is utilised to interface the GSM modem and GPS receiver with the controller. The serial communication between the modems and the microcontroller is accomplished via the RS-232 protocol. To convert TTL voltage levels to RS-232 voltage levels, a serial driver IC is employed. A programme has been created that can track an individual's exact location on a Google Map.

GPS can be utilised for a number of land, sea, and air applications and offers extremely accurate position data. GPS, which originated as a military application, has evolved into a useful tool for a variety of commercial and personal uses. A location tracking system is one of these applications (LTS). A GPS receiver and a wireless transceiver are included in these tracking systems, which allow a remote unit to track the individual's whereabouts. The GPS tracking device collects GPS signals from satellites and uses them to compute its position on the planet. A wireless receiver capable of the civilian L1 frequency (1575.42 MHz) is required to obtain GPS data. The GPS receiver estimates the distance between four or more satellites at the same time. A receiver's latitude, longitude, and altitude can be determined using triangulation.

Most cities in India (such as the top 20 cities) have very high-resolution Google Earth satellite imagery,

allowing you to clearly view and identify roads and buildings. Within Google Earth, a new feature called Google community allows you to see placemarks and names of major buildings, highways, and key locations in the city.

Customers can also use Google Earth to establish a list of places in the city where they frequently travel, such as their workplace, store, suppliers, and customer locations. If these locations are highlighted in Google Earth and placemarks are submitted to our system, you can see in reports when the individual arrived at these locations and how much time they spent there.

IV. SYSTEM ARCHITECTURE
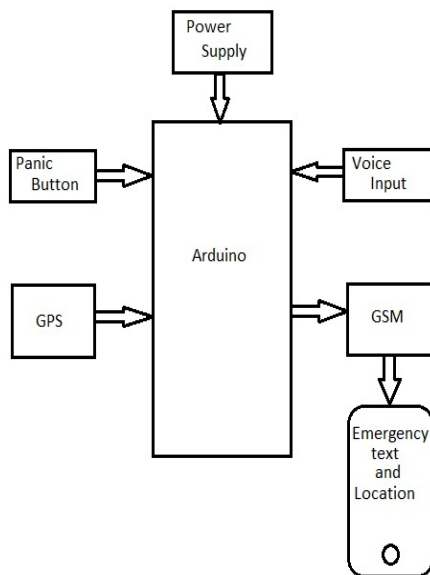
Figure 2: System Architecture

V. COMPONENTS USED:

GPS:

Figure 3: GPS

The Global Positioning System (GPS) is a space-based radio navigation system that offers civilian users with accurate positioning, navigation, and timing services on a continuous global basis, free of charge. The system will provide position and time to anyone having a GPS receiver. GPS delivers precise location and timing information for an unlimited number of individuals in all weather conditions, at any time of day or night, anywhere on the globe.

GSM:

Figure 1: GSM

The Global System for Mobile Communication (GSM) is an acronym for "Global System for Mobile Communication." A technology developed by Group Special Mobile, a French business, in 1985. In truth, this communication system was created for personal communication, but it is now used for a variety of purposes. The only wireless communication technology that does not have a range constraint, any equipment that is controlled or monitored can be operated from anywhere in the globe.

GSM-400, GSM-800, GSM-900, GSM-1800, and GSM-R are the frequency bandwidths specified for GSM services in various nations. The GSM-900 and GSM-1800 frequency bands are the most extensively used in various parts of the world.
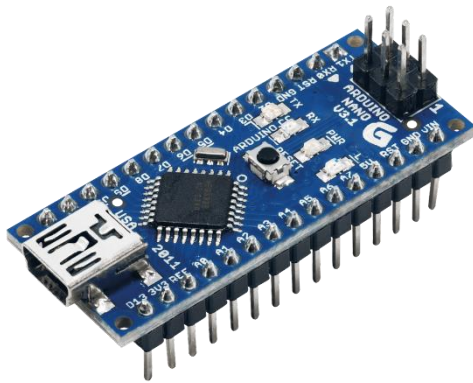
ARDUINO NANO:

Figure 4: Arduino Nano

The Arduino Nano is one of the tiniest and most intriguing breadboard-compatible boards currently available. Because of its superb functionality and the vast variety of potential uses, it has become quite popular among beginning programmers. This tool, which is based on the ATmega328P, is ideal for people who want to develop their programming skills and build some unique projects. While the item does not include a DC power supply, it does include a mini-USB cable for charging, allowing it to be used with any PC or laptop.
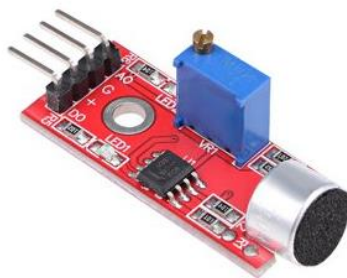
MICROPHONE SENSOR:

Figure 5: Microphone Sensor

A single channel signal output sensor, the Sound Detection Module Sensor for Intelligent Vehicle Compatible With Arduino. When there is sound, the output is low level and signal light, and when there is no sound, the output is low level and signal light. It can be used for acoustic light control, sound and light alarms using a photosensitive sensor, as well as sound control and detection. (The maximum distance for induction is 0.5M.)

Note that this sensor can only detect the presence of sound (by the vibration principle) and cannot determine the magnitude or frequency of the sound.

VI.   RESULTS

Kit:

Figure 7: Kit

Screenshots:
>After 3 seconds of pressing the panic button, an emergency message with the words ALERT, I AM IN DANGER will be sent as an SMS to the pre-defined mobile numbers.
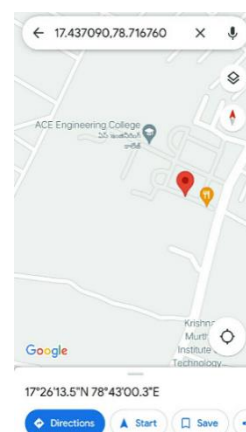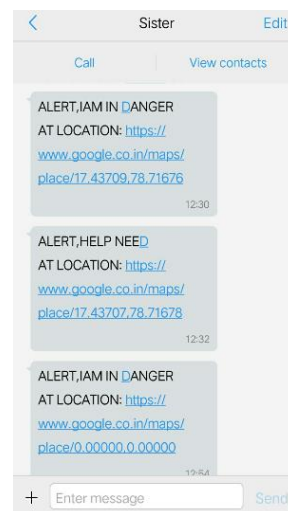

Figure 6: Screenshot2

>The location is also transmitted to the predetermined numbers along with the emergency message.

>After saying the word HELP into the microphone, an emergency message with the words ALERT, HELP NEEDED will be sent by SMS to the selected mobile numbers.
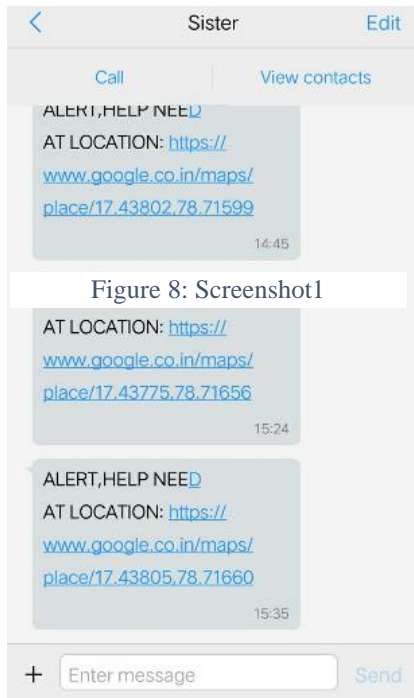

Figure 8: Screenshot1

Figure 9: Screenshot4

>Along with the emergency message, the location is also sent to the pre-selected numbers.

VII. CONCLUSION

The project titled "Voice-activated emergency tracking gadget for women" is a self-defense model that includes a tracking unit that uses Google maps to track its whereabouts and also sends SMS via mobile communications. It informs loved ones of their current location in real time. Using highly compact Arduino modules that can be stitched into fabrics, the smart safety wearable device can be enhanced significantly in the future. A more energy-efficient device will also need to be developed, one that can store the battery for a longer period of time.

Using Google maps, the placement is done in terms of latitude and longitude, as well as the precise location of the spot. The system tracks a certain individual's location and sends an SMS to the user's phone. The received data, which is in the form of latitude and longitude, is used to pinpoint the person's location on Google maps, which we can also see on the LCD, and it will also send the same data to the relevant mobile number.

VIII. ACKNOWLEDGEMENT

Figure 10: Screenshot3

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