

# Body Temperature Measurement for Remote Health Monitoring System

<sup>[1]</sup> Priyanka Sharma, <sup>[2]</sup> Ram Narayan Shukla, <sup>[3]</sup> Tarun Dhar Diwan

<sup>[1][2]</sup> Computer Science and Engineering, OP Jindal University, Raigad, India

<sup>[3]</sup> Computer & Information Technology, Govt.E.R.R.P.G Science College  
Bilaspur, India

**Abstract:** In today's world, women safety has become a major issue as they can't step out of their house at any given time due to physical/sexual abuse and a fear of violence. Atrocities towards (and against) women are forms of oppression hindering the development of women and thereby resulting in gender injustice, this being ideologically supported by a value system, which is androcentric and gender insensitive. Deepening inequalities and struggles by the oppressed section to assert their rights (granted under democracy) have unleashed retaliations by the more privileged and, women situated as they are in the social matrix as non-free, dependent subjectivities, become specially affected ones. Even in the 21st century where the technology is rapidly growing and new gadgets were developed but still women's and girls are facing problems. Even today in India, women can't move at night in secluded places and even at day time crowded places hundreds and thousands of incidents of physical/sexual abuse happening to every day women in this country. Among other crimes, rape is the fastest growing crime in the country today.

**Keywords—** women safety, GSM modem, Internet of Things, machine learning, intelligence security.

## I. INTRODUCTION

This proposed the system for security of women. It presented a wireless method which will alert and communicate with the secure medium. It will also record the incident and subsequently transmits the wearer's location along with the audio recording to the police. When the sensor kit button is pressed the mobile will record the incident and it will collect the information of the user [3]. This information will be sent to the registered phone number along with the recordings. This system will Speed monitoring for women's security which can be done by using the GPS tracking mechanism. Alert messaging will be done on the registered phone numbers. This saves the time and that victim gets help without loss of time [1].

Design of open APIs on all levels of the IoT ecosystem: Design of standardized format for description of data generated by IoT devices to allow mashups of data coming from different domains and/or providers [2]. The updated list of IoT applications presented below includes examples of IoT applications in different domains, which is showing why the Internet of Things is one of the strategic technology trends for the next 5 years. Smart Food/Water Monitoring Smart Health Smart Living Smart Environment Monitoring Smart Manufacturing Smart Energy Smart Buildings Smart Transport and Mobility Smart Industry Smart [3] City Smart Tourism An alternative approach to the traditional methods. Our Application will notify friends or family if you are in

some trouble and need a help from them. It sends your Android phone's location through GPS by using SMS so you can be found fast [4]. Also, it automatically sends an image related with that situation to those emergency contacts. This research presents an analysis review on the principal need of intelligence security system with technology requirement and challenges to build the system [5]. This system can help the victim to get emergency help from the friends or family. This reduces risk and brings assistance when needed. This research describes about a safety triggering application developed in android platform. The uniqueness of this application apart from other Safety application available is that it sends an image related with the situation to the emergency contacts. Many applications available in the market send only a custom message to the registered number but not the location of the user [6]. In the proposed and tested application, the longitude, latitude information and the general idea of the place of the current position of the mobile user is added with the custom message that had been initially set in the application and is transmitted to the phone registered numbers [7]. This feature of the application not only helps in finding the exact location of the person in problem but also will help the police to trace the location of incident easily [8].

## II. RELATED MATERIAL AND CHALLENGES

(a)GPS reliability: The GPS used in this project suffered from initialization problems during overcast. The GPS

also was unable to initialize quickly when kept under extreme indoors. This problem can be overcome by using a higher-grade GPS module or by simply collecting the GPS data from the phone which is already enabled with a GPS device [9].

(b) ZigBee Range: The range of 2.4GHz ZigBee module is 100m with LOS this significantly drops with interference of obstacles. To improve range Lower frequency RF modules can be used but lower frequency modules will require longer antennas. A trade-off between range and antenna length needs to be achieved to maximize the efficiency [10].

(c) Power Consumption: Both the GSM SIM900 module and the TARANG P20 modules consume a lot of power, which make portability of the device a problem [11].

(d) Battery consumption: The application built for this project consumes a large share of the battery supply. This can be avoided simply by reducing the frequency of updating the GPS location to the server yet maintaining accuracy by using last known location or location predictive algorithms [12].

(e) SMS Confidentiality: The project has a system where registered people around the user get SMS from the victim's phone. This reveals the victim's phone number to everyone which can be a potential security concern. This can be solved using either gateway message services that send SMS through http post or by GCM, XMPP server that send data over the packet network where the sending party's credentials can be encrypted and hidden [13].

(f) Buzzer - It is a sensor, which gets input from the user and produces output in digital format. Usually a buzzer is a form of a switch, give output 0 when it is not pressed and give one as output when pressed [14].

(g) Temperature sensor- It used to measure the amount of heat energy produced by an object or human body, it produces an output in analogue format, a formula is used to convert the analogue signal into the temperature of human body [15].

(h) Heartbeat sensor - It is used to measure the speed of heartbeat; this sensor can be placed in any nerves of human body. Usually, the output is in analogue format. Hence it can record the change in the heartbeat [16].

(i) Sound detector sensor - This sensor used to detect when a sound has exceeded a set point you selected; it produces output in digital format. The sound is recorded via a microphone and stored in an LM393 op-amp. The set point of sound level is adjusted via a potentiometer. When the sound level exceeds the set point, the output is sent low [17]

### III. PROPOSED METHODOLOGY

The methodology used in this research; the embedded device can be activated by just merely pressing the emergency press button (SOS) once for the alert purpose. This smart device based on IoT gets activated, which includes a GPS modem, which retrieves its location in terms of its longitude and latitude, the data is fed to the microcontroller, which retrieves the location details of the device from GSM and it triggers The wristband also triggers a mobile application will receive information from a chip embedded in the wearable device of the women and send the instant location of the device with a message "Save Me, I'm in Danger", through GSM to her friends, family members, the police, or a group through the chip used in the wearable sensor device along with the audio recordings[18].

Internet of Things (IoT) The Internet of Things (IoT) refers to the network of devices that are accessible through internet connectivity and the communication that occurs between these devices and other Internet-enabled devices and systems. IOT is expected to offer advanced connectivity of devices, systems, and services that goes beyond machine-to-machine (M2M) communications and covers a variety of protocols, domains, and applications [19].

### IV. MECHANISMS FOR DETECTING LOCATION

(a) GPS is a Global Position System is a radio navigation system used to provide geographical location; this is mainly used in military forces; this technology can be used to track the location of a person and to determine the position of an object. GPS will broadcast a message which contains current position, time, latitude and longitude of the place where it is situated. It establishes a connection to the required number of satellites, and at minimum at least four satellites should be used for calculating current location of the system, then GPS initiate a process that solves a set of equations to find precise current location, this can take place within few minutes or seconds depending on the strength of the receiver. The GPS does not require the user to transmit the data; it operates independently through internet reception to enhance GPS positioning information. This GPS system is available as a module that can be embedded in any mobility devices, so this system can be helpful for women to track the location information when they feel unsafe or in danger situations [20].

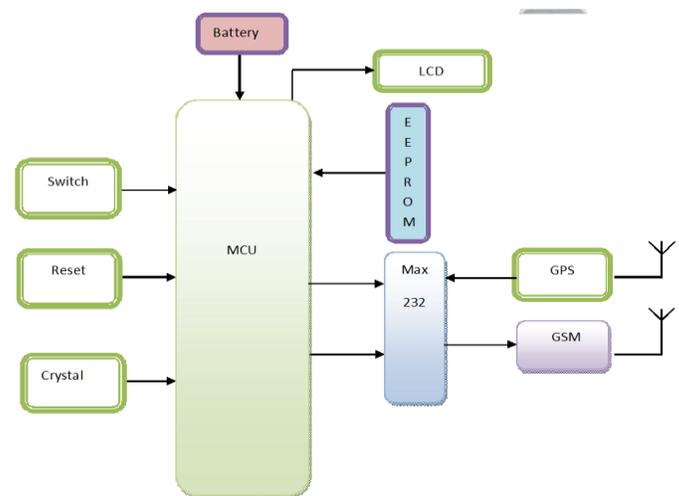
(b) Using street image Mobile phone's camera is used to capture the street image of the current place when women

are in danger situation. As soon as such situation is detected, the camera captures the image automatically and sends to the cloud, the street images are recognized by the police or neighbors, and the women are tracked quickly.

(c) GSM is a Global system for mobile communication, it is the most successful digital mobile telecommunication system, and it also termed as second-generation system. GSM provide various services based on voices and data delivery, some of the GSM services are Tele-services, bearer services and supplementary services. GSM mainly used for its tele-services for voice transmission and messaging services, when two users need to communicate via GSM system, a connection between the mobile node and nearby base station is established, the base station reaches the nearby base station of other user using BSC(base switching center, thus a connection is established between the two users within few seconds, GSM also provides emergency communication which has higher priority that preempts other connections, the advantage of GSM communications are wireless communication and worldwide connectivity, better frequency efficiency and many users can access at a time, hence this system can be used for emergency communication when a woman faces a difficult, unsafe situations[21].

(d) Wi-Fi is wireless communication devices based on IEEE 802.11 standards, most commonly used Wi-Fi module are ESP8266, which is a low-cost Wi-Fi microchip with full TCP/IP stack and microcontroller capability. This module can be integrated with any mobility devices. Wi-Fi can be used to connect to the internet and send data to cloud reliably. Schemes on Sensor Sensors are a device that can detect or measure any physical property; it will indicate or record or responds to it, mainly sensors are used to detect the changes in the environment that may be physical, visual or sound. Sensors are used in day to day life such as thermometer used to measure temperature and touch-sensitive lift buttons [22]. The usage of sensors is increased exponentially in modern days, it's gone beyond measuring temperature, pressure and flow, every mobile device various sensors like proximity sensors, gravity sensors and accelerometer sensors, sensors provide output mostly in analog signals based on input quantity changes in environment, this analog output can be converted into human-readable format. Sensors can be able to communicate in the wireless medium; it can also communicate with each other; such communication network is known as wireless sensor networks. Many sensors are available as micro devices which are small and compatible, this can be embedded in any mobility

devices to detect the changes, so sensors can be used to detect the condition of the women automatically when she is a danger [23]. The device works based on the IP address assigned to it, and have the ability to collect and transfer data over a network without manual assistance or intervention. The interconnection of these embedded devices (including smart objects), is expected to lead in automation in snarly all fields, while also enabling advanced applications like a smart grid, and expanding to areas such as smart cities[24]. In this application the security system is done using the actual location tracing and SMS, Audio to text Transmission module. The system sends the emergency SMS by two categories online and offline if the victim doesn't have the internet GPS is used to identify the current position of the victim [25]. The device has an accurate GPS sensor and helps others to know the current location of latitude and longitudinal position of the device.



**Figure 1. the location is located using GPS module.**

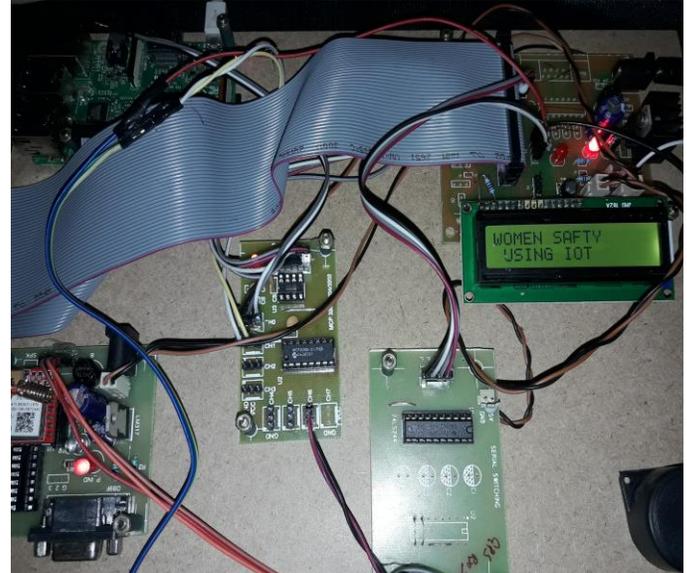
Smartphone connectivity: The device is linked to a smart phone using blue tooth wireless connection. Once the push button pressed, the Smartphone gets connected, through the app it sends alert SMS to those contacts in case of an emergency. The contact numbers can be edited and stored in the permanent memory of the device. Microcontroller: A Microcontroller is tools that use a specific code to perform all tasks and control of all devices which are connected to it. It is dedicated to a single function, and is most often embedded in other devices [26].

The device can be activated by just merely pressing the emergency button once. This device gets activated and the alarm starts ringing and also sends instant location with a

message to the police and concerned family members. Figure 3.2 shows how the device looks like and when the emergency button is clicked, the device sends the message with instant location message to the police but we used any 3 random phone numbers as this is just a demo. The location is located using GPS module. The GSM Modem (sim 900) can accept any GSM network operator SIM card and act just like a mobile phone. The plus point of using this modem will be that you can use its RS232 port to communicate and develop embedded applications [27].

**V. EXPERIMENTAL RESULTS**

**INTERNET OF THINGS** We is entering a new era of computing technology that many are calling the Internet of Things (IoT). Machine to machine, machine to infrastructure, machine to environment, the Internet of Everything, the Internet of Intelligent Things, intelligent systems-call it what you want, but it’s happening, and its potential is huge. Depending on who you talk to, the Internet of Things (IoT) is defined in different ways, and it encompasses many aspects of life-from connected homes and cities to connected cars and roads (yes, roads) to devices that track an individual’s behavior and use the data collected for “push” services. Some mention one trillion Internet-connected devices by 2025 and define mobile phones as the “eyes and ears” of the applications connecting all of those connected “things.” Depending on the context, others give examples that are less phone-centric, speak of a class of devices that do not exist today or point to Google’s augmented-reality smart glasses as an indication of things to come. A quick Internet search highlighted the following example use cases/applications under consideration: Machine-to-machine communication Machine-to-infrastructure communication Telehealth: remote or real-time pervasive monitoring of patients, diagnosis and drug delivery Continuous monitoring and firmware upgrades for vehicles Asset tracking of goods on the move Automatic traffic management Remote security and control Environmental monitoring and control Home and industrial building automation “Smart” applications, including cities, water, agriculture, buildings, grid, meters, broadband, cars, appliances, tags, animal farming and the environment to name a few.



**Figure 2. shows the emergency alert condition.**

Embedded intelligence in devices through sensors has formed the network connection to the Internet [5]. It can make domestic electric appliances realize intelligent control, for example refrigerators that can detect the quantities of various items and the freshness of perishable items. Embedded smart sensors may provide the means to communicate with users by sending alerts via the Internet connectivity. The connection can primarily be wireless or any other available communication, such as DSL, GPRS, Wi-Fi, LAN, and 3-G.

**TABLE I: Table on the bases of different Things: -**

People in trouble	Heartbeat sensor	Temperature sensor	Message alert
P1	72	26	Not a panic
P2	74	27	Not a panic
P3	72	33	Emergency please alert
P4	73	28	Not a panic
P5	79	34	Over temperature please alert
P6	80	27	Over heartbeat please alert
P7	72	30	Not a panic

<b>P8</b>	<b>72</b>	<b>34</b>	<b>Over temperature please alert</b>
<b>P9</b>	<b>71</b>	<b>26</b>	<b>Not a panic</b>
<b>P10</b>	<b>81</b>	<b>25</b>	<b>Over heartbeat please alert</b>

This research focuses on providing security to users which includes location-based services, SMS services, GPS services and system Architecture. Throughout the development of the first phase of the project, we have learned much more new skills ranging from vital experience in working as a team and the new technologies. In the first phase of this project we have completed some of the modules which include registration module in which user registers password and id which is then used for login module to use the application. In next module we have given one activate button which has several uses. This activate button is used to enable silent mode and data service. In last phase of this project we have completed all modules[8]. We have provided one option to user to add any five emergency contacts, another one is to update that added contacts. Also, we have implemented one message box which will contain one text message and link of the GPS location having longitude and latitude forward to those emergency contacts. Also, we have implemented one mechanism to send an image related with that situation. It can be concluded that the system helps in some of the cases the system can provide useful evidences. Since the system can capture image of incidences which can act as the evidences. This is the “Stay Safe App” which is very useful application mainly for girl’s safety. When we feel that we are in emergency situation, for example travelling alone at night time we can use this application. So that on one click we can send our location to our family members and to any police stations. So once we click on activate button it continuously send updated locations messages to all authorized persons. So this application is having both safety and security which needs the engineering code of conduct which is essential in the today’s world. This project proposed the system for security of women[15]. It presented a wireless method which will Salter and communicate with the secure medium. It will also record the incident and subsequently transmits the wearer’s location along with the audio recording to the police. From the above survey, we analyzed that GPS, GSM and sensor can be used to track only users nearby locations and can only send alert SMS to limited people. In the existing system, there is a buzzer which alerts people

when they are in danger, the smart phone must be ensures the safety of women by using a buzzer system to send alert SMS, the user will share location to their family members and SOS service to send the text message. So, a new system needs to be developed which can send alert messages automatically without human intervention. The accuracy level of detecting violation of women can be improved by sensing more physical human body parameters [2,8]. When’s the sensor kit button is pressed the mobile will record the incident and it will collect the information of the user. This information will be sent to the registered phone number along with the recordings. This system will Speed monitoring for women’s security which can be done by using the GPS tracking mechanism. This is the “Women security system using GPS and GSM” which is very useful application mainly for girl’s safety. When we feel that we are in emergency situation, for example traveling alone in the Auto/Cab at night time we can use this application. so that on one click we can send our location to our family members. The audio to text also alerting the emergency contacts by sending the messages with the location. This system can overcome the fear that scares every woman in the country about her safety and security. The application that send online as well as offline SMS to particular emergency contact number [23]. Alert messaging will be done on the registered phone numbers. This saves the time and that victim gets help without loss of time.

**VI. CONCLUSION AND FUTURE WORK**

This research focuses on providing security to users which includes location-based services, SMS services, GPS services and system Architecture. Throughout the development of the first phase of the project, we have learned much more new skills ranging from vital experience in working as a team and the new technologies. In the first phase of this project we have completed some of the modules which include registration module in which user registers password and id which is then used for login module to use the application. In next module we have given one activate button which has several uses. This activate button is used to enable silent mode and data service. In last phase of this project we have completed all modules. We have provided one option to user to add any five emergency contacts, another one is to update that added contacts. Also, we have implemented one message box which will contain one text message and link of the GPS location having longitude and latitude forward to those emergency contacts. Also, we have implemented one mechanism to

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