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WOMEN SAFETY USING IoT

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ABSTRACT

Nowadays, women's are as powerful as men in almost all the sectors but there are some security issues a woman is afraid of.The only thought a woman has in her mind whenever she wants to go out is when she will be able to move freely on streets even in the odd hours without worrying about their security. In this seminar, I am proposing a model which will help to ensure the safety of women all over the global. Different sensors are used in this model are heartbeat sensor, temperature sensor, accelerometer sensor for detecting heartbeat, temperature and sudden change in motion of beneficiary.

GPS is also used in this model to track the location of the device and GSM is used to send the help message to the relatives of the beneficiary and police station. I have proposed the IoT (Internet of Things) based device for continuously monitoring the values of different sensors and GPS used in the device.

KEYWORDS: IoT, Microcontroller, HELP, GSM, GPS, sensors.

INTRODUCTION

The Internet of Things (IoT) refers to the use of intelligently connected devices and systems to exploit data gathered by embedded sensors and actuators in machines and other physical objects [5]. IoT refers to the ability of network devices to sense and collect data from the world around us, and then share the data across the Internet where it can be processed and utilized for various purposes.

In the present scenario women are competing with men in every prospect of the society. Like men, they also contribute in the development of our nation. But while contributing, they have the fear of getting harassed. Therefore it is very much important to ensure women's safety. In this report, we are proposing a model for required women's safety. Various sensors are being used in this model which will measure different parameters respectively. The proposed model is wearable; therefore it is easy to carryanywhere. It is basically a band like structured model which ensures the woman's safety.

We have already discussed the wide utilizations of IoT. More questions are getting to be implanted with sensors and picking up the capacity to convey. There are numerous sorts of uses rising one of most regular being following framework i.e. checking the conduct of people, things, or information through space and time. The arrangement proposed in this class exploits the rich highlights offered in Androids advanced cells.

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This work displays a model which depends on GPS tracker framework. Here, ARM-7 LPC2148 is to be utilized as microcontroller, alongside GSM and GPS module.

The main feature of this device is to get the woman‘s location without its interaction in the process with simple and cost effective method, done by use of GSM and SMS. The device will also have the panic button.In case of any emergency, if anyone presses the button, automatic help message will be sent to any 3 registered mobile numbers on the server. Like any software product or design, there is still room for enhancement. Features can be added to enhance the system. The proposed system will be implemented, continued, reviewed and improved in a later work.

LITERATURE VIEW

In 2013, a paper was published which proposed an idea of tracking the soldier and navigation between soldier to soldier such as knowing their speed, distance, height as well as health status of them during the war, which enables the army personnel to plan the war strategies. Base station gets location of soldier from GPS. They used different sensors such as pulse rate sensor, biosensors to determine the various parameters of soldiers. They also used graphical LCD, RF transceiver, GPS (SR87), ARM (LPC2138). The device would be lightweight to carry around. The soldier will able to communicate with each other whenever needed. Use of ARM processor and low power requiring peripherals reduce overall power usage of system.

In 2014, a smart girl security framework was proposed in worry of ladies' wellbeing. The proposed framework is to outline a convenient gadget which looks like an ordinary belt. It comprises of Adriano Board, GSM/GPS modules, shouting caution and weight sensors. At the point when the limit of the weight sensor crosses the framework will consequently get begins and it will instantly sends the area and help messages to the relatives, companions' and police. The framework is additionally fit to create an electric stun to hurt the aggressor which may help the casualty to get away.

In 2015, a paper based on wild life security was published which used the similar concept of IoT based device. They used ATmega16 8-bit microcontroller for power consumption, GPS (SR87) for tracking location, RF Transceiver (CC2500) for reading data from GPS, Biosensors for measuring body temperature, pulse rate, etc and computer to display the information. The paper provides accurate health information and location of the animal and can be implemented in wild life sanctuaries.So they can be protected from illegal hunting, killing or capturing of wild animals. It also provides safety and security to wildlife and help to increase their numbers which are on extinction.

Remembering a similar concern numerous designers have concocted creative applications. Some of them are:

VITHU APPLICATION

This is a crisis application started by a famous Indian wrongdoing TV arrangement "Gumrah" publicized on Channel [V]. In this application when the power catch of the Smartphone is squeezed twice sequentially, it will start conveying ready messages with a connection to the area of the client like clockwork to the contacts nourished into the application.

SHE (SOCIETY HARNESSING EQUIPMENT)

It is a piece of clothing planned by three designers from Chennai. This piece of clothing has an electric circuit that can produce 3800kv of current which can help the casualty to get away.

If there should arise an occurrence of various assaults it can send up to 82 electric stuns. Since

the texture is bilayer, the client isn't influenced. It can likewise send crisis messages.

ILA SECURITY

The fellow benefactors of this framework, McGivern, James Phillips, and Neil Munn, have outlined three individual cautions that can stun and bewilder potential aggressors and attract regard for unsafe circumstances.

ARCHITECTURE

The Internet of Things (IoT) is the between systems administration of physical gadgets, vehicles (likewise alluded to as "associated gadgets" and "savvy gadgets"), structures, and different things implanted with hardware, programming, sensors, actuators, and system availability which empower these articles to gather and trade information.

BLOCK DIAGRAM

The block diagram is divided into two sections:

- Transmitter
- Receiver

TRANSMITTER

Power supply of 5v is used for Microcontroller, GSM and GPS module while 3.3v power supply is used for temperature sensor, motion sensor and heartbeat sensor. Sensors will continuously send their values to microcontroller.

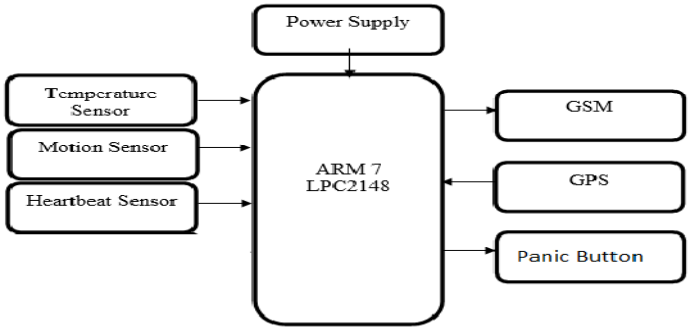

Figure 1.Block diagram of Transmitter

Microcontroller will contrast readings of sensors and limit esteems. Microcontroller will produce "HELP" message in like manner relying upon the examination. GPS join to microcontroller will track the situation of the gadget. GSM connected to Microcontroller will send message to contacts put away in SIM.

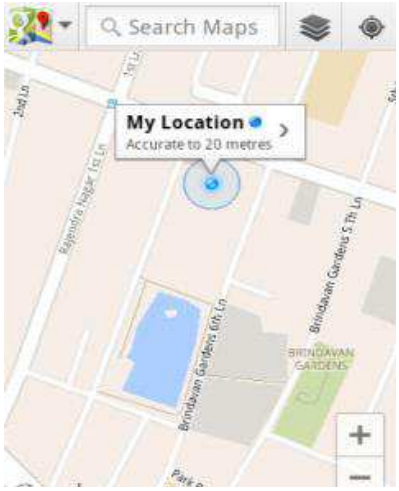

Figure 2.GPS location of user on map

The Panic Button is used for emergency purpose. By pressing Panic Button, the 'HELP' message will immediately generated and GSM will send that HELP message to the contacts without comparing the threshold values of sensors. The sample SMS is shown in figure below when user presses the Panic Button in emergency.

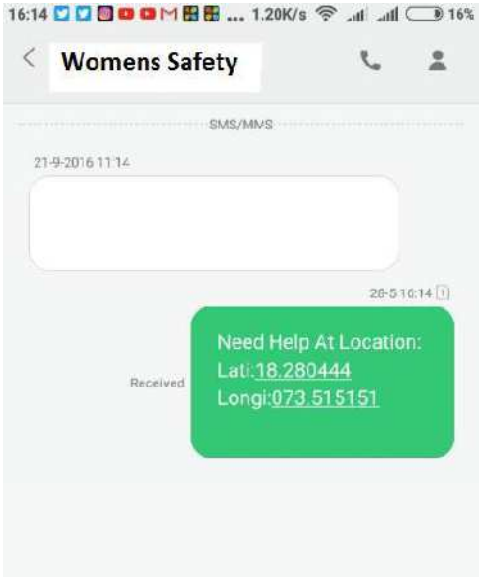

Figure 3.Sample SMS when panic button is pressed

RECEIVER

Receiver takes the inputs from Transmitter. It is used for checking the values of sensors. Raspberry Pi or laptop can be used to process and display values of sensors and position of device. End device which is being used for display readings should be connected to the internet.

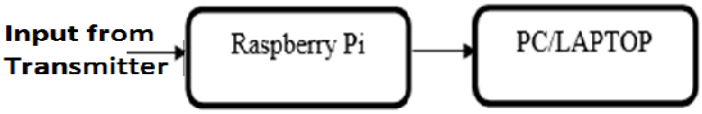

Figure 4.Block Diagram of Receiver

HARDWARE'S USED

Hardware components used in this device are :

- **Microcontroller**: Any ARM 7 microcontroller having two UART ports can be used. In proposed model we have used ARM 7 LPC2148. LPC 2148 is 32/16 bit RISC microcontroller. It has two 10 bit ADC with 14 channels. It also has two UART ports which used for GSM and GPS systems.
- **Raspberry pi**: Raspberry pi is single board computer. Its CPU speed ranges between 700MHZ and 1.2 GHZ. It also has on board memory between 256 MB and 1GB Ram. This is used at receiver to display values and position in terms of latitude and longitude.
- **GPS:** GPS stands for global positioning system. GPS is used to track the device. GPS gives a position of a device in terms of latitude, longitude and altitude. GPS is used to track moving device using satellite signal. When GPS is used there is communication between GPS transceiver and GPS satellite.
- **GSM:** GSM stands for global system for mobile communication. GSM is a cellular technology which is used for voice and data transmission. GSM operates in-band of 900 MHZ to 1.8 GHZ. GSM is used to send the 'HELP' SMS on mobile.

SENSORS USED

HEARTBEAT SENSOR

The pulse sensor depends on the guideline of photograph phlethysmography. It gauges the adjustment in volume of blood through any organ of the body which causes an adjustment in the light force through that organ (a vascular area).

There are two sorts of photophlethysmography:

TRANSMISSION

Light discharged from the light producing gadget is transmitted through any vascular area of the body like ear cartilage and got by the locator.

REFLECTION

Light emitted from the light emitting device is reflected by the regions.

TEMPERATURE SENSOR

Temperature is the regularly estimated natural amount. This may be normal since most physical, electronic, substance, mechanical, and natural frameworks are influenced by temperature. Certain substance responses, organic procedures, and even electronic circuits perform best inside restricted temperature ranges. Temperature is a standout amongst the most normally estimated factors and it is subsequently not astounding that there are numerous methods for detecting it. Temperature detecting should be possible either through direct contact with the warming source, or remotely, without coordinate contact with the source utilizing emanated vitality. There are a wide assortment of temperature sensors available today, including Thermocouples, Resistance Temperature Detectors (RTDs), Thermistors, Infrared, and Semiconductor Sensors.

A thermocouple (T/C) is made from two dissimilar metals that generate electrical voltage in direct proportion to changes in **temperature**.

MOTION SENSOR

A movement sensor is a gadget that notification moving items, for the most part individuals. A movement sensor is much of the time joined as a segment of a framework that routinely plays out an assignment or else alarms a client of movement in an area. These sensors frame a vital segment of security, home control, vitality proficiency, mechanized lighting control, and other supportive frameworks. The primary rule of movement sensor is to detect a thief and send an alarm to your control board, which gives an alarm to your checking focus.

WORKING

In this class, three sensors are being utilized yet we are chiefly concentrating on the Heartbeat sensor since when a man is stuck in an unfortunate situation, its heart Beats will get expanded.

WORKING OF A HEARTBEAT SENSOR

The essential pulse sensor comprises of a light discharging diode and an indicator like a light distinguishing resistor or a photodiode.

The heart beat beats makes a variety in the stream of blood distinctive areas of the body. At the point when a tissue is lit up with the light source, i.e. light transmitted by the drove, it either mirrors (a finger tissue) or transmits the light (earlobe)[5]. A portion of the light is consumed by the blood and the transmitted or the reflected light is gotten by the light identifier. The measure of light consumed relies upon the blood volume in that tissue. The identifier yield is in type of electrical flag and is relative to the heart beat rate.

This flag is really a DC flag identifying with the tissues and the blood volume and the AC segment synchronous with the heart beat and caused by pulsatile changes in blood vessel blood volume is super imposed on the DC flag.

Consequently the significant prerequisite is to confine that AC part as it is of prime significance.

To accomplish the assignment of getting the AC flag, the yield from the finder is first sifted utilizing a 2 organize HP-LP circuit and is then changed over to advanced heartbeats utilizing a comparator circuit or utilizing basic ADC. The computerized beats are given to a microcontroller for ascertaining the warmth beat rate, given by the recipe-

BPM(Beats per minute) = 60*f

Where f is the pulse frequency

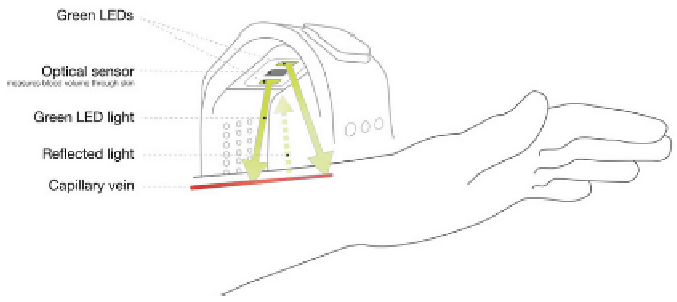

Figure 5.Working of Heartbeat Sensor

Proposed Model is wearable model. Subsequent to giving force supply to gadget, sensors on gadget will begin taking readings. These readings are ceaselessly sent to microcontroller. Microcontroller will contrast these readings and the edge esteems given to it .This limit esteems can fluctuate from individual to individual. In the wake of looking at this limit esteems, Microcontroller will send "Help" message as needs be. GPS is utilized as a part of gadget to ceaselessly track gadget. Utilizing IoT innovation we can constantly screen changes in sensors esteems. Position of gadget can likewise be track constantly. At the recipient side gadget like workstation, cell phone, raspberry pi and so on can be utilized to see sensor esteems and position. The gadget at recipient ought to be associated with web keeping in mind the end goal to get information from transmitter.

CONCLUSION

In this research system we used a transmitter in which a microcontroller is used which takes the inputs as readings of different sensors, compare it and transmit the result to receiver. A receiver is used which gets all the outputs of transmitter. At the end if there is any threat to a woman then a direct message (need help at location) is sent to the recommended person/persons. The main advantage is that this is a wearable device and occupies very little space such that it can be carried out anywhere at any time.

Hence in this way, we used IoT for monitoring the values of different sensors and GPS for the device. It is also beneficial from the paper it is discuss that it is also used to send the messages to the relatives of beneficiary.

FUTURE SCOPE

The Research is going on to increase the efficiency. The efficiency gets increased by embedding the ARM processorwith body part of human being. Also the researches are going on for further decrease in the size of the device. The sensors may used for continuous monitoring and future diagnosis within body.

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