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A System for Real Time Monitoring and Imparting Emergency Circumstances.

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ABSTRACT

Now a day's individual wellbeing observing has been generally expanded by joining the points of interest of brilliant sensors, GPS and GSM innovation. The gadget can recognize basic circumstances with the individual | anybody conveying the convenient piece of the framework (e.g. critical heartbeat) and also send these points of interest to the healing center and care taker. So proper activity can be contemplated momentarily. The data sent by the gadgets | electronic device | system to the Hospital and guardian incorporates the exact area of the individual on the earth as longitude and latitude (i.e., It send the data with latitude and longitude location) scope using GPS and GSM. This area and data makes the framework to become powerful for the folks | individuals for monitoring the individual's health.

Keywords: Sensor, Remote monitoring, Global system positioning (GPS), Ambient assisted living (AAL),

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INTRODUCTION

There's an enormous interest in both open and private segments to produce more usage of electronics| gadgets, aiding, scrutinizing soft-ware and home wellbeing correspondence advances to remote monitor[1-3] the individual anyone health condition given for the folks who really needs attention towards his/her health condition remotely. Ambient assisted living [4-6] innovations are for the patients requiring support with the exercises of living yet wishing the individual living autonomously for long time. Aided living interfaces the crevice between the independent living and doctor's facility. Inhabitants in aided living focus the inadequate to live their specific yet they don't generally require any steady care to take care of them. Systems predicated on WSN [7-8] have now been outlined which supports the patient living at homes. This system involves sensor center points notwithstanding base station. Sensors focus are of two sorts: one is that individual needs to transport (example. circulatory strain, etc.) and others which are presented in house (example, fire sensor). The base station gathers information from these sensor hubs and when there is any basic circumstance, sends that information to the adjacent healing center to guarantee that fitting activity can be mulled over quickly. There is one confinement with this framework, this will work only within the space environment and if anyone leaves the home it is extremely tough to monitor the individual health.

Foundation

There is an incredible interest, in both general society and private parts, to take the activities expected to grow utilizes for electrical gadgets, assisted living and observing programming, and house wellbeing correspondence innovations to give aided living and medicinal services to whom in need. Aided living advances are for individuals requiring support with Exercises of day to day Living (ADLs) however wishes to live autonomously to the extent that this would be possible. Aided life exists to cross over any barrier between free life and nursing house. Inhabitants supported life focuses are yet to ready to live without anyone else yet don't oblige steady care either. Frameworks taking into account WSN has so been planned which bolster helped living at houses of elderly individuals. This frameworks now made out of sensors hubs alongside base station. Sensors and hubs that are of two sorts: first that individual needs to wear (e.g. circulatory strain, heartbeat sensors and so on.) and second is introduced in house (example. entryway sensors, weight sensors and so on.). Base Station gathers information from sensor and hubs and if there is any unusual circumstance, send information to the closest nursing house so that suitable move can made quickly. There is one impediment with these frameworks; This can function the length of individual is inside the house.

Inspiration

The objective of our work is to develop this framework and incorporate the backing for versatile helped living. In our framework, any wearable sensor hub will have two things furthermore: GSM module and a GPS module. GPS module here is for staying informed concerning area of the individual when he is out of the house. GSM module here is for educating the nursing home about any anomalous circumstance when individual is out of house. This GSM module is required in light of the fact that when the individual is out of house, this wearable sensor hub may not be in the scope of base station. At the point when the individual is inside the house, any occurrence identified by the wearable sensor hub is educated to the base station utilizing the handset and it is the obligation of the base station to advice nursing home about the frequency. Entryway sensors alongside different sensors continue sending information to the base station. Utilizing this information at whatever point base station recognizes that individual is going out of the house; it sends a charge to the wearable sensor hub to initiate its versatile mode. At the point when versatile mode is actuated, GSM and GPS module are fueled up. These modules are shut down in non-portable mode. In portable mode at whatever point wearable sensor hub distinguishes any anomalous circumstance; it doesn't send that information to base station. It peruses current area of the individual utilizing GPS module. Utilizing GSM module, it then sends the area alongside other important data as a SMS to the nursing home. After that it begins calling nursing home until somebody really answers the call to guarantee the way that nursing home is educated about the rate and proper move can be made instantly.

System Design and Working Principle

The objective of our work is to extend this technique and range from the backing for compact aided living. Sensors situated on bodies may comprise of GSM [9-10] and GPS. GPS helps to provide geographical

coordinates of an individual whenever he /she out from the house. GSM module is utilized for educating the healing center and overseer through SMS (about any basic circumstance when individual has gone out of house). This GSM module gets to be essential in light when the individual has gone out of house. This versatile sensor hub must not be potentially in the scope of base station
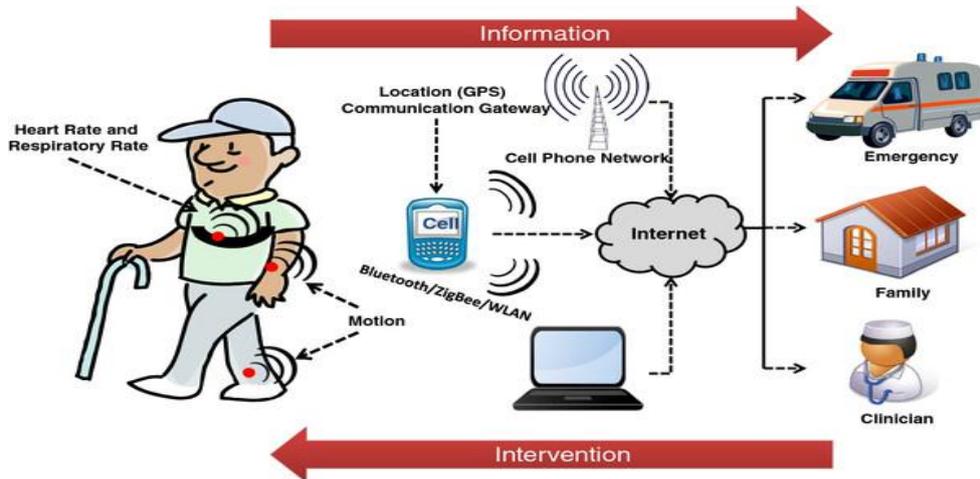

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Figure 1: Architecture diagram

Figure-1 shows the architecture of our system. At an instance when the individual is inside, any frequency recognized by the stationary sensor hub is educated to the couches base station using the handset. It is the obligation of the cots base station to impart to healing facility concerning as to the occurrence. Applying this information at whatever point base station identifies that individual is taking off from the home; it sends a summon to the convenient sensor hub to adjust on its versatile mode. At the point when versatile mode is initiated, GSM and GPS module are controlled up. These modules are shut down in stationary mode. In versatile mode at whatever point convenient sensor hub recognizes any discriminating circumstance; it doesn't send that information to base station. It peruses current exact area of the individual utilizing GPS module. Utilizing the GSM module it sends the situation consolidated with the readings identified in the form of message to the closest doctor's facility.

Implementation

The Figure-2 shows the structure of Inter processing module and Hardware block diagram. All the Sensor modules are connected to the Micro-Controller [11-12] (Data Processing Module). In addition to any sensors has GPS and GSM module connected via UART port.
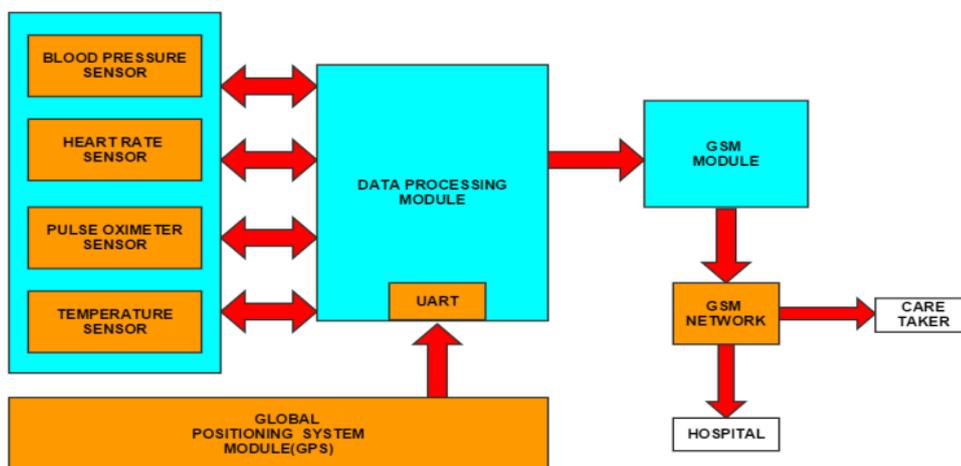

Figure 2: Hardware block diagram

Data acquisition module

The Data Acquisition module comprises of Non-Wearable sensor and Wearable sensor. Non-Wearable sensors are sensors which are introduced in the home at different areas e.g. entryway sensor hub at the key entryway of your home to distinguish passage and way out. Whenever there is some type of abnormal situation such as, opening/shutting of entryway has been identified. This node sends that data to the information processing module. The huge occasion of Wearable sensor is indistinguishable to Non-Wearable Sensor. Wearable sensor found in this paper are Blood pressure sensor, Heartbeat/ Heart rate sensor, Pulse Oximeter. These sensors sense the readings rate value of the patient.

Location monitoring module

The Location Monitoring module is nothing but the Global Positioning System (GPS). GPS is a system which is used to monitor the location. GPS module is connected to a satellite wirelessly. GPS beneficiary gives an answer high in position, accurate velocity, the capability of the sensitivity is very high and tracking capabilities in remote area as well as urban conditions is also high. If the GPS module is attached to a person it get the current latitude and longitude location of the person.

Data processing module

The Data Processing Module composed of Micro-Controller connected with various sensor modules, GPS module and GSM module via UART port. The Micro-Controller get the monitored value from sensors continuously, If any of the reading value crosses the threshold limit (which is predefined by the user), First the Micro-Controller will get the location of the person using GPS and send the sensor reading values as Short Message System (SMS) to the hospital and care taker using GSM module.

Application module (Remote Monitoring)

The last Module is the Application module which is composed of GSM which is used to send the monitored value via Short Message System (SMS) along with latitude and longitude location to the hospital and care taker. A SIM900 module is used for sending SMS using AT commands. In this paper, we use four AT commands AT, CMGF, CNMI, CMGS. AT- Attention command which is used to connect with neat by network. CMGF- Creating new message. CNMI- Creating new Text message. CMGS- Adding phone number. The baud rate can be configured from 9600 to 115200 (recommended 9600). Once the message is send to the hospital and care taker, they take necessary action.

RESULTS AND DISCUSSION

Figure 3: Over All Hardware Structure

The figure-3 shows the Overall hardware layout. It consist of smart sensors like Heart beat sensor, pulse Oximeter, Blood Pressure sensor and Fire detector which is all connected to a PIC 16F877A Micro Controller via UART port.
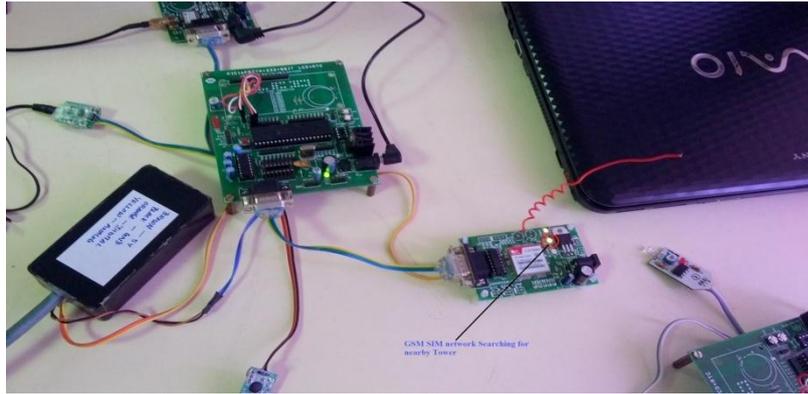
Figure 4: GSM Synchronization

The Figure-4 shows the GSM Synchronization. Once the GSM component is powered UP, It search for nearby Mobile tower for connection. And once the GSM is triggered for the very first time it originally pursuit the regional system to send the message to a care taker which can be really important stage. This emergency situation of anyone is informed to hospital and care taker by giving a message.
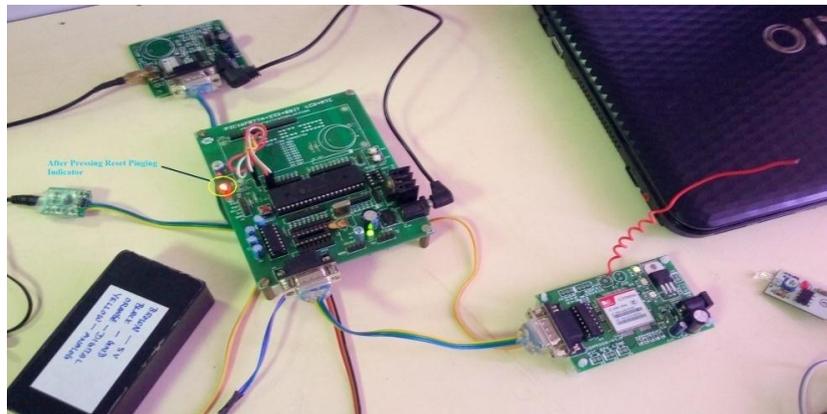

Figure 5: GSM Sync with Microcontroller

The Figure-5 shows the GSM is synchronizing with the PIC 16F877A Micro Controller. If GSM is not synchronized with microcontroller it will not send the message if at all any abnormal situation occurs.
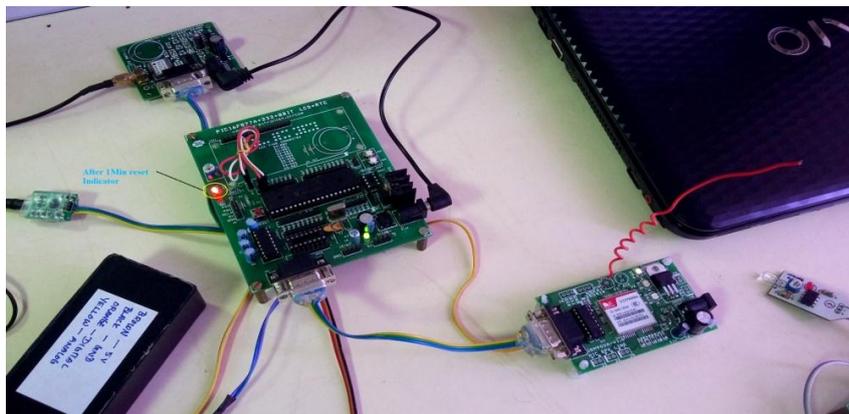

Figure 6: Time Slice

The Figure-6 shows the Time Slice which will be continuously reset the timer counter after each one minute, In order to start new count for getting patient pulse, blood pressure and oxygen level in blood by the sensors.
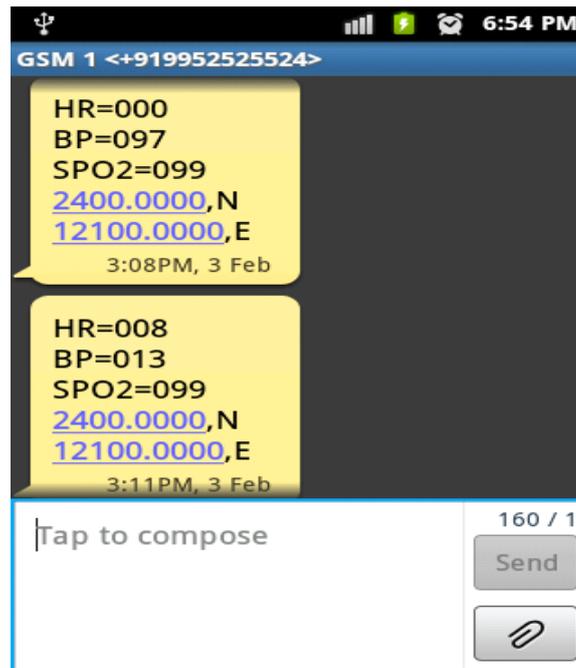
Figure 7: Abnormal Notification

The Figure-7 shows the abnormality output which is sent to the mobile using GSM. If any abnormal situation is detected by the microcontroller it get the sensor readings along with latitude and longitude location it send the message using GSM.

Where-→ HR for Heart Rate | Heartbeat, BP for Blood Pressure and SPO2 for Pulse Oximeter

CONCLUSION

The proposed framework has been executed by joining the profits of sensors and GSM innovation. Officially planned aided living frameworks helps in checking the patient and provide the information of the patient inside the territory environment utilizing radar innovation. It is slightly difficult to monitor the individuals health using radar technology because using radar technology more amount of patient's health could be monitored simultaneously that may overlap the reading of one individual | anyone with other reading. When he truly needs to re-spot, somebody needs to go with him to care for any basic circumstances that may happen with him on the way. With this system, the individual can move without the sidekick and he's/she's regardless being observed. This gives them a sense to be more free. This system can send message to hospital and care taker when critical situation occurs. It doesn't matter whether the individual exists in your home or outside the house or without the benefits of dependency. The gadget incorporates a not too bad helpful quality for older people and person who doesn't have to abide in center and need to live the life independent. This System improve the options that come from top gimmicks of brilliant sensors, GPS, GSM and message to hospital and care taker if any abnormal situation occurs.

Future work

In addition to our system, more smart sensors can be enhanced for better monitoring of patients. In case of emergency sending of Short Message Service (SMS) can be added with additional Phone calls facility. Involving of new innovative technology can overcome the problem of power source and total size compatibility which makes the patient to carry these sensors and microcontroller more easily.

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