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RESEARCH ARTICLE

A REVIEW ON APPLICATION OF GSM FOR MONITORING SYSTEM

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ABSTRACT

In today's advanced world lots of innovative applications are built on mobile phone based technologies and more are being developed. Therefore mobile pervasive technology can be used in several areas. Hence, in this paper, we present about several GSM applications in various fields such as in medical field for detecting body temperature, heart beat rate, wireless ECG using Bluetooth which helps to make the patient monitoring devices more mobile. Several GSM based microcontroller are used for antitheft security system with text message as feedback and raise an alarm. GSM based city area monitoring system is another advantage.

Key words:

GPS, GSM, Solar Panel,
vibration sensor, RFID, AMR.

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INTRODUCTION

GSM (Global System for Mobile communications) is a digital cellular technology used for transmitting mobile voice and data services which is developed by Group special mobile (founded 1982) which was an initiative of CEPT (conference of European post and telecommunication).

GSM provide data transfer speeds around 9.6 Kbit/s, allowing the transmission of basic data services such as SMS (Short Message Service). Another major advantage is its international roaming capability, allowing the users to access the same services even when travelling abroad.

This gives consumers to have the same number connectivity in more than 210 countries. GSM satellite roaming has also widened its service access to areas where terrestrial coverage is not available. GSM. GSM-1800 is used to send information from the Mobile Station to the Base Transceiver Station (uplink) and 1805 - 1880 MHz for the other direction (downlink), providing 374 channels (channel numbers 512 to 885) and duplex spacing is 95 MHz.. GSM gives worldwide connectivity,

Transmission quality, high reliability, uninterrupted phone call. It uses encryption and TMSI instead of IMSI. SIM is provided with 4-8 digits PIN to validate the ownership of SIM.

Gsm Applications In Various Fields

City Area Monitoring System

The city area monitoring system allows a home owner or the particular area monitor to tenuously monitor the various significant home sensor conditions as well as those are tied to flooding, fire, and gas leaks to detecting burglars in their starting stages and alert the people about the sudden events. Home owners or the particular area monitors can monitor their homes or the particular location via their mobile phone or by using the Internet. This system can also be used in alerting the people about the security firms, defense organizations and municipalities to constantly monitoring and locating the little spots in suburban neighborhoods and compounds using web based free GIS Maps application [1]. This system can play a vital role in monitoring the house through detectors, detecting any abnormal event, alerting home owner through SMS when the event occurs, notifying security service providers or the Civil Defense Department/Security firm with the emergency and its type so they can take immediate action.

System Architecture

To meet the above requirements, the system is designed to have two subsystems; a Home Gateway (H-Gate), and Monitoring and Dispatch Server (MDSS) center. The H-Gate comprises of the TCP/IP enabled Micro-GPRS and set of sensors to monitor

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gas leaks, flooding and intruders. H-Gate is located at the monitored home. The MDSS center is located at the monitoring firm service provider center (e.g., Security firm or Civil Defense) and interacts with a Short Message Service Center (SMSC) located at premises of the local mobile network service provider. MDSS uses the SMSC to send SMS messages to home owners. In addition to SMSC, the MDSS uses the online Map Server's GIS capabilities to show live maps of homes and their status to either the home owners or the service providers like the police, security companies, civil defense or the municipality[1].

The system consists of set of sensors to monitor the abnormality event.

Gas Sensor

- High sensitivity
- Low power consumption
- Miniature-size

The MQ-303A is a tin dioxide semiconductor gas sensor which has a high sensitivity to alcohol with quick response speed. The change of the sensor resistance (R S) is obtained as the change of the output voltage across the fixed or variable resistor (R L). In order to obtain the best performance and specified characteristics, the values of the heater voltage (V H) circuit voltage (V C) and load resistance (R L) must be within the range of values given in the standard operating conditions

Gsm Based Health Monitoring System

The movement of physically handicapped or aged people and the people suffering from some severe diseases are usually restricted to their homes, because of their health conditions. They are kept into helpless situation when they need to go out even for small work [3]. Here there is another example for monitoring patients remotely using GSM network & Very large scale integration (VLSI) technique. The System continuously monitor the health conditions and send the information regularly to the hospital as shown in figure 3[4]. The abnormal deviation in the set values of any of these parameters will be immediately sensed and local help is sought from the nearby people. It is a bi directional communication system in which the Doctor/care taker, at any time, can send SMS to know the present parameter status of the person or patient. It enables the doctors to monitor patient's parameters (heartbeat, ECG, body temperature) in real time through an SMS.

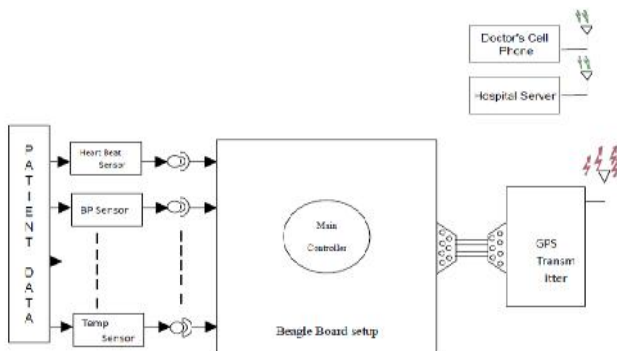


Figure 1 Proposed system

This system which we proposed to develop as shown in figure 4[4] would help in monitoring the patient when he is in the bed and also when he is mobile. This system provides a continuous health monitoring Service for patient. ECG, temperature and Heart Beat pulse signals are measured and are processed by a built-in ARM processor. This processed data is then transmitted by GSM wirelessly and the received data is sent to the PC. The graphical user interface (GUI) programs on the PC are coded using Visual Basic languages which are used for transmitting the information of any abnormal health conditions to the specified mobile number of the doctor written in the program when the measured temperature exceeds the allowable value or any pulse measured is abnormal through a GSM modem.

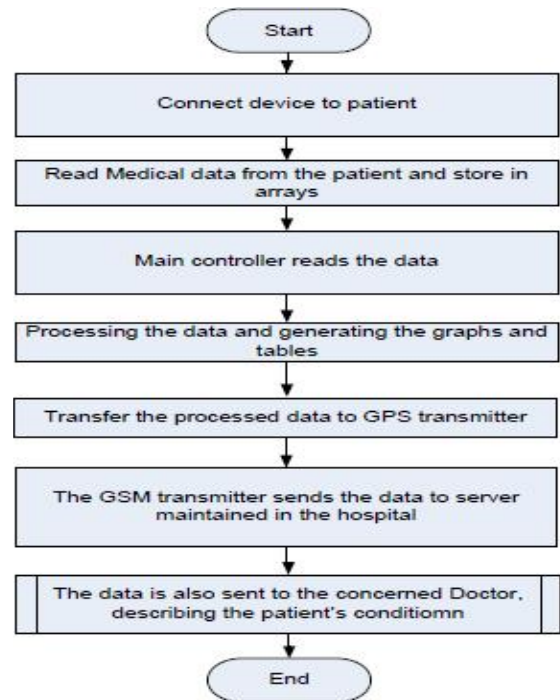


Figure 2 Flow diagram of the proposed system

Antitheft Security System Using Gsm

This system utilizes an embedded system design with Dual Tone Multi Frequency (DTMF) and a GSM to monitor and safeguard a car.

In a situation where there is high level of theft, there is serious requirement of better security system which does not put human life to risk [6]. This tends to utilize the availability of GSM technology to accomplish this purpose. By simply dialing the number of the mobile phone attached to the circuit and sending a code after the phone has automatically been answered, puts the system to either "active or " state. In case of any theft attempt, the system is automatically switched off and an alert message is send to the owner. Hence the car will always remain protected. The absence of security personnel in a packed car is a great discomfort to car owners. Thus in order to enhance an improved and life risk free security system we use this technology , here the purpose is to aid a better security system of cars with the use of GSM. Hence this system monitors one's car against theft, and sends the text message to the car owner, indicating him that his car is being tampered. The system will also stop the car (that is stopping the car from

moving) and set up an alarm for the people around to notice what is happening.

System Description

The diagram in figure 6[6] describe the overall system. The system comprises of a GSM which act as an intermediate between the outside world (car owner) and the entire system. It is responsible for both sending of text message to the car owner and receiving of calls for system activation and deactivation. Its output is in the form of frequency which is fed to Dual Tone Multi-Frequency (DTMF) decoder IC, this decoder then converts these frequencies into digital voltage levels of ones and zeros. The digital voltage levels received from the DTMF decoder is now fed into microcontroller Integrated circuit. The micro controller is controlled with a written program stored into its Read Only Memory (ROM). The controller with the direction of the written program co-ordinate the system's operation as follows: If the system is active, it surveillance both the car doors and boot to check if anyone is opened. Stops the car by disconnecting the ignition line from the battery supply via the actuator. Sends text message to the car owner signifying where the attempt is made from. And then starts up an alarm for alert purpose. But, if the system is in-active, the microcontroller disables all sensor inputs and outputs.

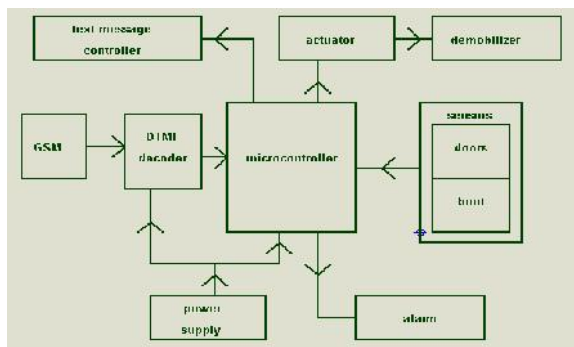


Figure 3 Functional Block Diagram of the System.

CONCLUSION

It is always a better idea to start every design with a good proposal, which will act as a reference point to the work as it proceeds. This paper has presented the design and implementation of low cost, compact, low power GSM-GPS based city area monitoring systems. The monitoring service is accessible through the mobile phone or through the internet. It is also illustrated that how GSM based service can become useful in accessing health related treatment and can also provide security against antitheft system. Thus, we have presented how GSM applications are being used and proved to be beneficial in almost every field.

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