ISSN 2347 - 3983

International Journal of Emerging Trends in Engineering Research (IJETER), Vol. 3 No.6, Pages : 288 - 291 (2015)
Special Issue of NCTET 2K15 - Held on June 13, 2015 in SV College of Engineering, Tirupati
http://warse.org/IJETER/static/pdf/Issue/NCTET2015sp55.pdf

The addition to the portable sensing structure for patient monitoring system

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Abstract: Now a day's healthcare industry is to provide better healthcare to people anytime and anywhere in the world in a more economic and patient friendly manner. In the present paper the physiological parameters such as Pulse rate, Heart Rate and Temperature are obtained, processed using ARM7 LPC 2148 processor and displayed in the mobile Application. If any vital parameter goes out of normal range then alert SMS will be sent to Doctor Mobile. This system is utilizing low cost component to transmit data to physicians for monitoring, diagnosis and patients care at a significantly low cost, regardless of patient's location.

1. INTRODUCTION:

The electronics technology has entered almost in all aspects of day-to-day life, and the medical field is not exception for that. The need for well-equipped hospitals and diagnostic centers is increasing day by day as the people are becoming more conscious about their health problems. In biomedical fields special units are used, such as intensive care unit or coronary care unit. All of these units are designed to offer the advantage of the low Nurse – Patient ratio and concentration of the equipment and the resources needed; to take care of critically ill or seriously injured units. The medical world today faces two basic problems when it comes to patient monitoring, firstly the need of healthcare providers present bedside the patient and secondly the patient is restricted to bed and wired to large machines. In order to achieve better quality patient care, the above cited problems have to be solved. As the technologies are advancing it has become feasible to design to Horne based vital sign monitoring system to display, record and transmit signals from human body to any other location. system is expected to monitor patient under critical care more conveniently and accurately for diagnosing which can be interfaced with mobile to bring it under a network system widely for the doctor to monitor the patient's condition sitting in his own office without being physically present near to the patient's bed.

2. OVERVIEW:

The main aim of this project is to design for accessible interaction in home area networks to give automation and health assistance for patients in home.

2.1 EXISTING METHOD:

The project Assistive Housing was developed focusing on the elderly comfort, allowing home automation by using the television set and its regular remote control as an interface. The design strategy used to improve the legibility and accessibility of the home automation interface on the television screen was to use few and large graphical icons, with horizontal captions describing their function. The interaction is made through numbers as shortcuts avoiding navigation with keys. The idea of having a clean design, with few and large icons and the use of a consumer Electronics appliance that is already familiar to the user will be exploited in our work. The sensors data is collected and given to the Bluetooth module. The range of the Bluetooth is very less it may be up to 10mts to overcome this dis advantage we are going for Wi-Fi in proposed method.

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2.2 **PROPOSED METHOD**:

In addition to the interface design, this work presents the solution to implement home automation and to monitor the patient conditions a sensor network is designed to acquire context and to identify emergency situations. This project relies on power line communications. There are two other relevant projects to monitor elderly using sensor networks and integrating home automation, but they do not explore user interface design.

In order to integrate this interface with a home automation system, a development board with an embedded microcontroller was used. The interconnection between the android and the automation system was made using a Bluetooth connection that is currently available in most android models. A commercial Bluetooth module was used connected to the development board in order to execute the experiment.

3. SYSTEM DESIGN:

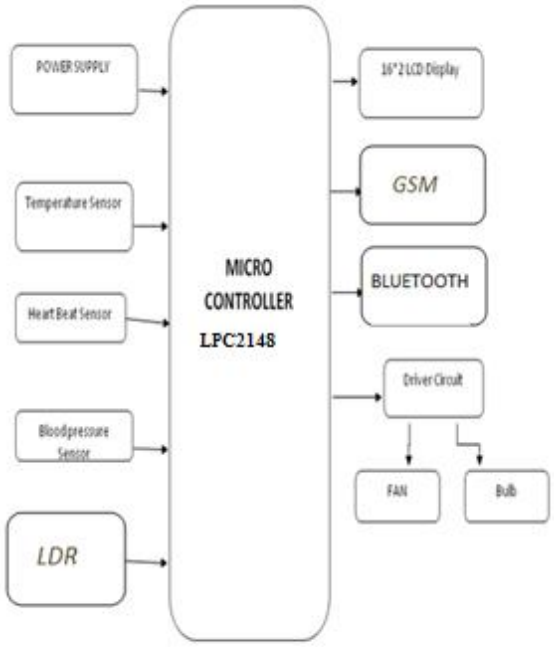
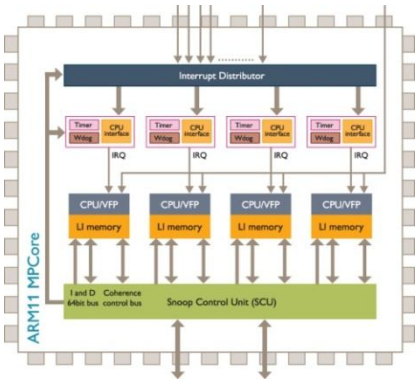


Fig: Block diagram

4. HARDWARE MODULES:

4.1 ARM(LPC2148):

The LPC2148 microcontrollers are focused around a 16-bit or 32-bit ARM7TDMI-S CPU with constant imitating and implanted follow help, which consolidate microcontroller with inserted high velocity streak memory extending. A 128-bit wide memory interface and one of a kind quickening agent building design empower 32-bit code execution at the most extreme clock rate. For discriminating code size applications, the option 16-bit Thumb mode decreases code by more than 30 percent with negligible execution punishment. Because of their little size and low power utilization, LPC2148 are perfect for applications where scaling down is a key prerequisite, for example, access control and purpose of-offer



4.2 Temperature Sensor:

The LM35 sensor series are integrated-circuit temperature sensors, whose output voltage is linearly comparative to the Celsius temperature. The LM35 arrangement are exactness incorporated circuit Lm35 temperature sensors, whose yield voltage is directly corresponding to the Celsius temperature. The LM35 sensor consequently has leverage over straight temperature sensors adjusted in ° Kelvin, as the client is not needed to subtract an extensive steady voltage from its yield to get advantageous Centigrade scaling.

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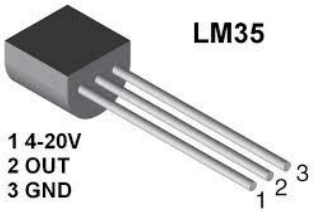

Fig: Temperature sensor

4.3 Heart beat sensor:

The heart beat sensor is intended to give computerized yield of heart beat when a finger is put on it. At the point when the pulse indicator is working, the top-most LED flashes with every heart beat. This advanced yield can be joined with microcontroller straightforwardly to quantify the Beats Per Minute (BPM) rate.

Fig : heart beat sensor

4.4 Blood Pressure Sensor:

The PS-2207 Blood Pressure Sensor uses an oscillometric method to calculate the systolic and diastolic blood pressure of a subject. This is the most common method for automated blood pressure measurements because the method is non-invasive and simpler to automate than the traditional ascultatory method, which typically requires a carefully trained practitioner to give accurate results.

Both the asculatory and oscillometric methods of blood pressure measurement are accepted by the American Association of Critical Care Nurses; however, the oscillometric method may give slightly different results between different measurement systems of blood pressure sensors due to differences in the algorithms used to determine the systolic and diastolic pressures from the oscillometric envelope.

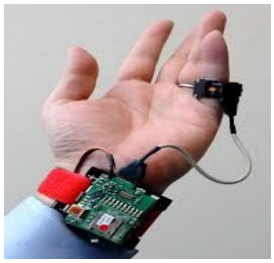

Fig :Blood pressure sensor

4.5 BLUETOOTH:

The Bluetooth wireless technology is set to revolutionize the way people perceive digital devices in our homes and office environment. Now they are no longer just the individual devices; instead, with the embedded Bluetooth technology, they form a network in which appliances can communicate with each other. This wireless technology is especially useful in home environment, where there exists hardly any infrastructure to interconnect intelligent appliances. It could be suitably used for home automation in a cost-effective manner. Operating over unlicensed, universally available frequency of 2.4 GHz, it can link digital devices within a range of 10 m (expandable to 100 m, by increasing the transmitted power) at the speed of 1 Mbps. Building upon this theme; we propose a home automation system based on Bluetooth technology

4.6 GSM:

GSM module is used to establish communication between a computer and a GSM system. GSM module consists of a GSM modem assembled together with power supply circuit and communication interfaces (like RS- 232, USB, etc) for computer. GSM MODEM is a class of wireless MODEM devices that are designed for communication of a computer with the GSM network. It requires a SIM (Subscriber Identity Module) card just like mobile phones to activate communication with the network. Also they have IMEI (International Mobile Equipment Identity) number similar to mobile phones for their identification.

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A GSM MODEM can perform the following operations:

1. Receive, send or delete SMS messages in a SIM.
2. Read, add, search phonebook entries of the SIM.
3. Make, Receive, or reject a voice call.

5. CONCLUSION & FUTURE WORK:

The system explained in this paper is based on the embedded technology of ARM processor in the development and research of data collection. The main goal of designing hardware is to meet the demand of low cost, low power consumption, small volume and real-time. It adopts LPC2148 micro-processor, sets up an embedded platform based on LPC2148 and realizes some applications such as USB communication, embedded Internet communication, infrared communication, etc. So the whole system performance increases greatly. The processor software is based on the embedded real-time OS and utilizes the multitask structure. The software system is more canonical and meanwhile, it is far more efficient and reliable in real running according to the demand of embedded OS and module design.

In terms of future work, we are planning to extend our approach to support additional wearable sensors such as Electrocardiography (ECG) and Galvanic skin response (GSR). We are also considering privacy-centric methods of extracting sound features from incoming and outgoing calls as a mechanism of determining emotional states. These data will be used to augment our ongoing mood inferring study.

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