Advance Wireless Telemedicine Application using Arm -7 Microcontroller

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Abstract— With the rapid growth of population and more attention about our health and care, it's more important to do the physical examination and check up every day, especially for old people. But India is dealing more with this problem of examine the patient. However, as we all know, it's very hard to have a physical examination in big hospital, waiting for half a day from schedule is not only a waste of time, but also a challenge to weak ones. So we can use this advanced system, which can collect kinds of physiological signal and convey it using GSM, including heart pulse and temperature, Pulse rate, GPS location. ARM-7 LPC 2148 is used in this system. it is real industry-specific ARM processor with small space and low power with high Performance, can suit most embedded applications. The people in India, particularly in rural or village and remote areas, are found suffer to receive timely medical treatment. The region area of the nation is characterized by densely populated communities spread over vast distances and there is a lack of expert physicians in certain hospitals of the health service. Telemedicine originally rose to serve rural or slum populations or anyone who is geographically dispersed, where time and cost better hostility travel make it difficult to receive the best medical care. Nowadays, telemedicine is forming and innovating a new structure in health-care services. By using information, data and telecommunication technologies from embedded world, in the proposed home based health monitoring system using ARM-7 processor includes the aspects of acquisition of medical parameters like Body temperature, heart pulse rate and ECG.

*Keywords:* Automation, Security, Medical

I. INTRODUCTION

In intensive care units there are provisions for continuously monitoring patients anywhere in world. Their temperatures, heart beats ECG etc. are continuously monitored using machine. But in many cases or situations, patients gets fine and come back to home from hospitals form danger situations. But the disease or problem may return, he may get infected with a new Disease, there may be a sudden heart attack that may cause his death. So in many cases, patients are released from hospital but still they are strongly and clearly advised to be under rest and observation for some period of time (from several days to several months). In these cases, our system can be quite handy for the people . Patient's data temperature, heart rate, ECG etc. will be continusly measured and sent to local server. Period of sending data(say every 3 min) can be set. Heart beats can be sent every minute and temperatures can be sent after some time etc. But these can be parameterized to ensure that when a patient is fit, not many readings will be sent so that sensors have a longer life. But when the patient is ill and not feeling well, readings will be taken frequently and sent to local server. Monitoring person or patient learns patient specific threshold. Say the regular body temperature of a normal person is 37 0C whereas one person feels feverish if his body temperature is nearly equal to 37 0C. By employing an averaging technique over a relatively long time, Observer can learn these thresholds for people. For startup of any GSM module AT commands are important. Programming is done in a "Embedded C" language with use of AT commands for GSM.

II. BLOCK DIAGRAM
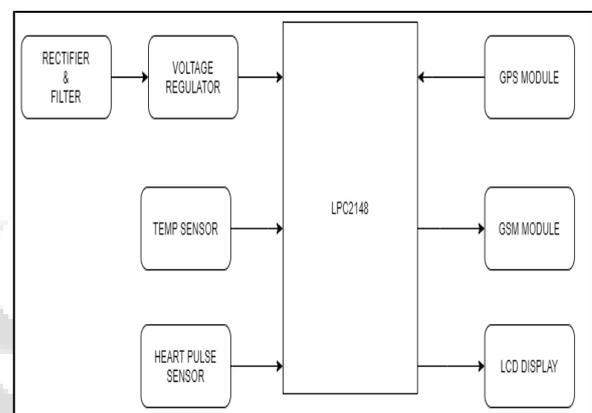
Above figure shows that the block diagram of the system. In this system we are using lpc2148 main microcontroller. This microcontroller has some unique features. It is a 64 pin in microprocessor used in embedded system development. In above figure rectifier and filter are performing role of power supply along with voltage regulator. In the system we are using two sensors these are the temperature sensor and heart pulse sensor temperature sensors to detect human body temperature and heart pulse sensors to detect heart pulse patient. Here in the system liquid crystal display has used to display a patient's body temperature and hert pulses. In the system the role of GPS and GSM is the vital GPS is used to detect the location where patient is and GSM module is used to send the GPS location to the respective doctor.
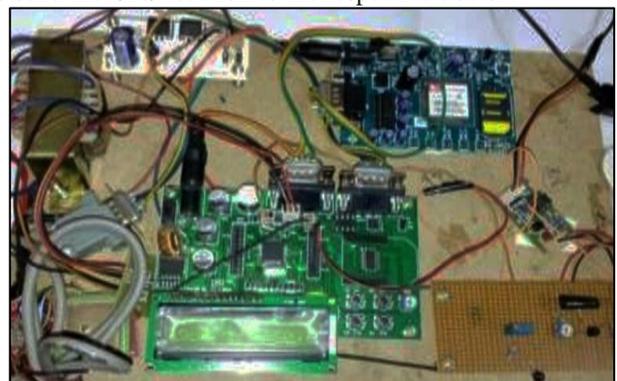
III. COMPONENTS

– LPC2148 Board.
– GSM module.
– GPS Module.
– LCD Display.
– Temperature Sensor.
– Heart pulse Sensor.

IV. FUTURE SCOPE

AWTESA aims at constructing a biomedical signal acquisition system that captures multiple biomedical signals and transfer the data to a recording and monitoring unit like an android phone.

AWTESA monitor patient's heartbeats and temperature continuously from centralized location setup in emergency ward i.e. ICU in hospital. Android application used by doctor can monitor patient's health condition.

V. CONCLUSION

Having worked on a Multi-Parameter Monitor System, our main aim is designing Telemedicine using ARM-7 LPC2148 based on patient monitoring system for hospitals and doctors with features of storing the received data in mobile SMS database is viable. GSM and GPS based patient monitoring system may be a better solution for a doctor to work from offline in case of emergency. By using this system we can detect multi parameter of the body such as heart rate, blood pressure, temperature sensor. The advantages of this system are the system is portable and easy to carry, mobility, compact size, with low power consumption, storing the data in mobile database and is very simple application. This system can be a powerful tool for doctors and nurse to monitor the patients data. This system can save the life off many people.

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