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A Review on Patient Monitoring System Using Embedded System

Poonam Vijaykant Gaikwad, Rajesh N. Patil

Department of Electronics and Communication Engineering, MIT (E) College of Engineering,
Aurangabad, India

Associate Professor, Department of Electronics and Communication Engineering, MIT (E) College of Engineering,
Aurangabad, India

ABSTRACT: In the recent years, continuous checking or physical condition of the patient is major challenges for the hospital and it is major issue faced by the hospital staff or authorities. The actual meaning of patient monitoring is to continuously monitor number of patients for multi-parameters at a time from a remote place Patient monitoring system provides emergency alerts and also the necessary input information direct to doctors. This paper provides the review on latest patient monitoring system, which is developed in the recent years.

KEYWORDS: Patient monitoring system, continuously monitor.

I. INTRODUCTION

Health care is very essential for today's generation and needs patient monitoring system which continuously monitor patient health, So patient monitoring systems are a need of today's generation and are helpful for every type of patient like older age, disables people and patients who bed ridden. Modern patient monitoring system provides better healthcare to people anytime and anywhere in the world. Today's medical world faces two basic problems, needs of health care's provider's presence near the bedside and patient is restricted to bed and wired to large machines. There are different modern Patient monitoring systems present, as shown in figure 1, like Tele-healthcare (it use information technology to provide healthcare services at a distance), Telemedicine (it is the use of electronic information and telecommunication technologies to support long distance health care, patient and professional health care), Telemonitoring (is a medical practice that involves remotely monitoring patients who are not at the same location as the health care provider), Remote patient monitoring (RPM) (is a technology to enable monitoring of patients outside of conventional clinical settings) and Remote patient telemonitoring system (it uses mobile phone enables doctors to monitor the vital different bio signal of patient) [1].

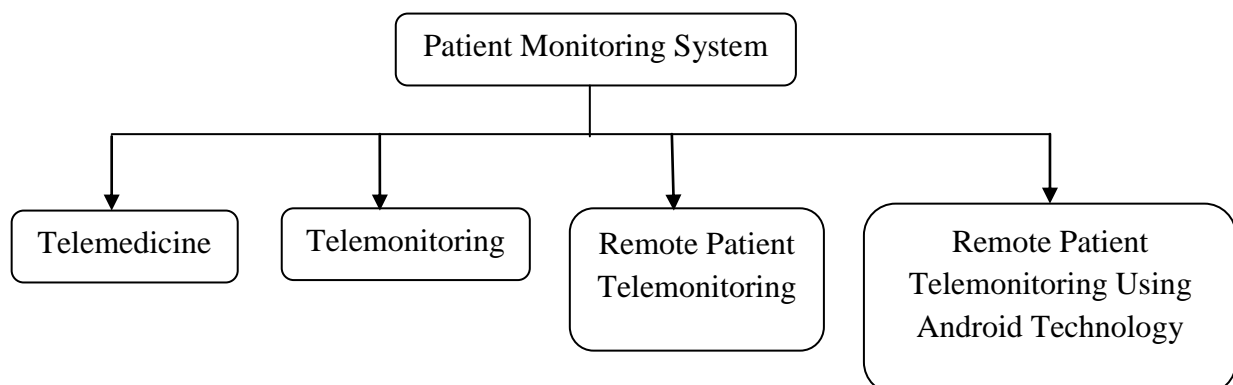


Figure 1 Different type of patient monitoring systems.

II. LITERATURE SURVEY

Prema Sundaram [1] presents the patient's vital signs like ECG, heart rate, breathing rate, temperature, SpO2 are captured and the values are entered into the database, these values uploaded into the web based server and sent to the doctor's phone using ANDROID technology. Figure 2 shows the block diagram of the proposed system, in which Software's like Java (is a wide variety of computing platforms from embedded devices and mobile phones), Android (is

a Linux-based operating system for mobile devices such as smart phones and tablet computers), ECLIPSE (open source community, whose projects are focused on building an open development platform comprised of extensible frameworks), and XAMPP(allow website designers and programmers to test their work on their own computers without any access) are used. This proposed system measure ECG (Electrocardiography is a Trans thoracic interpretation of the electrical activity of the heart over a period of time), Heart Rate, Body temperature, Pulse Rate (check overall heart health and fitness level) and SpO2.

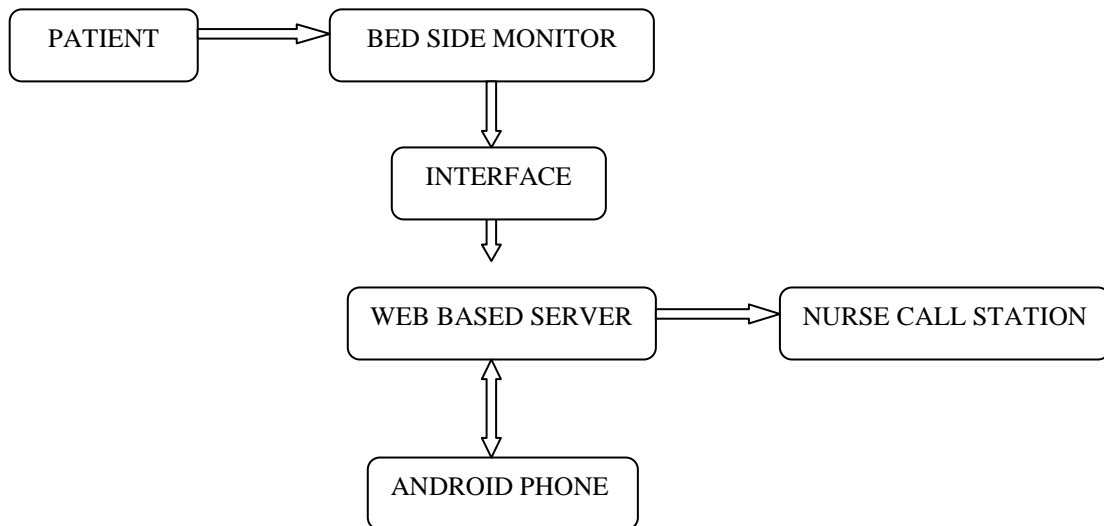


Figure 2 Block Diagram [1].

Chanakya Mothukuri and K. CH. Prathap Kumar. M [2] proposed a PMS (Patient Monitoring System) which can be operated wirelessly, which measures heartbeat, body temperature and percentage of oxygen in blood. This proposed system is developed by using GSM technology for monitoring the health condition of the patient. Figure 3 shows the block diagram of the proposed system. As shown in the Patient Monitoring System (PMS) Power supply circuit, Micro Controller (here LPC2148 is used), GSM modem (is used to alert the caretakers when there is a abrupt change in the measured parameters), ZIGBEE (used in wireless control and monitoring applications), Heart beat sensor, Temperature sensor (LM35 series are precision integrated-circuit temperature sensors), and SPO2 sensor are the main modules. All sensors are connected to the controller and the output of sensor is analog, hence ADC converts analog data to digital data and this data is sent in the form of an SMS to doctor’s mobile, using GSM modem. As per data doctor suggest medicines through SMS, which will be displayed on LCD.

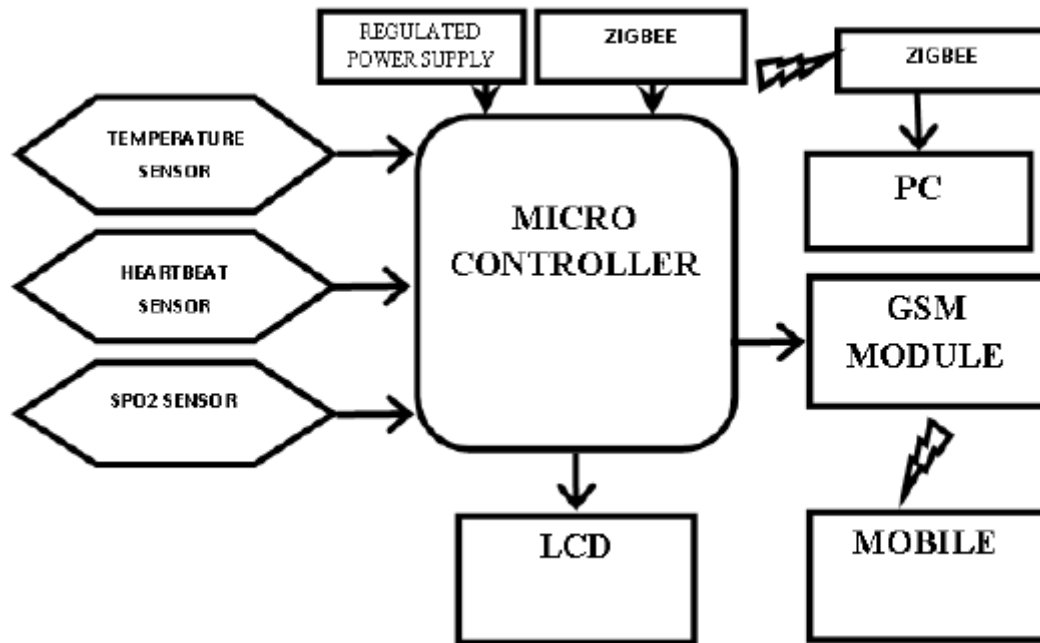


Figure 3 Block Diagram of PMS [2].

P. Karthick et al. [3] presents real time patient monitoring system used to continuously measure the physical parameters like body temperature, heartbeat, ECG, blood sugar, and oxygen level monitoring with the help of biosensors. Figure 4 shows Block diagram of the Proposed Systems. This system monitors important physical parameters like temperature, heartbeat, ECG, blood sugar by using different sensors. The acquired data from the sensors is transmitted to an ARM server using zigbee wireless sensor networks. Embedded processor compare input data against a predetermined value set and if these values cross a particular limit it would automatically alert the alarm and doctor via a SMS.

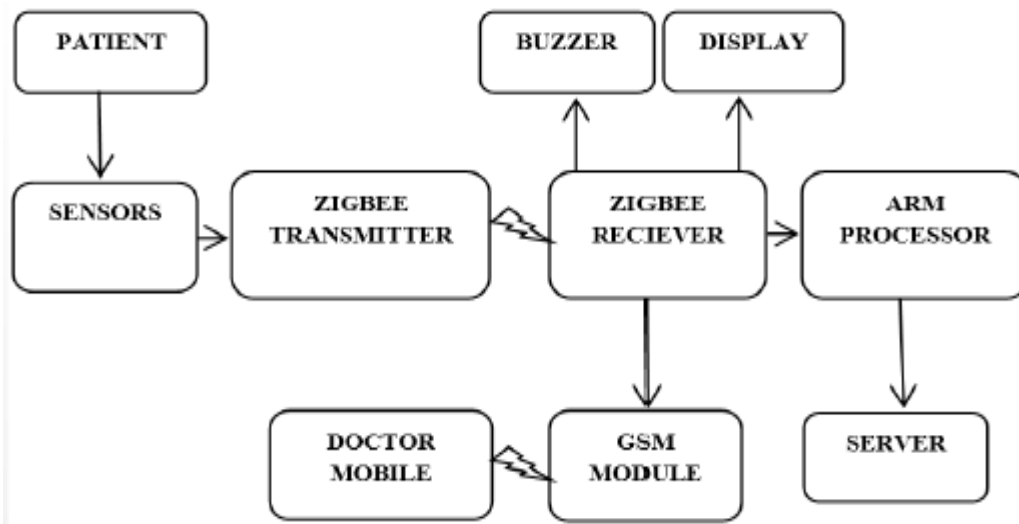


Figure 4 Block diagram of the Proposed Systems [3].

Ashish Ganesh Bajaj and Asst. Prof. Shaila P. Kharde [4] presents Simple wireless based Patient Sensor platform Monitoring system based on a microcontroller based system for wireless heartbeat and temperature monitoring using RF module. Figure 5 shows the proposed system block diagram, in which Heart Beat Sensor, Temperature Sensor LM35, Microcontroller 89S52, LCD Display, RF Module (used for applications that need two way wireless data transmission), ADC and Serial Communication Medium RS 232 (used to interfacing of microcontroller to PC).

Proposed system constantly monitor important body parameters like temperature, heartbeat and would compare it against a predetermined value set.

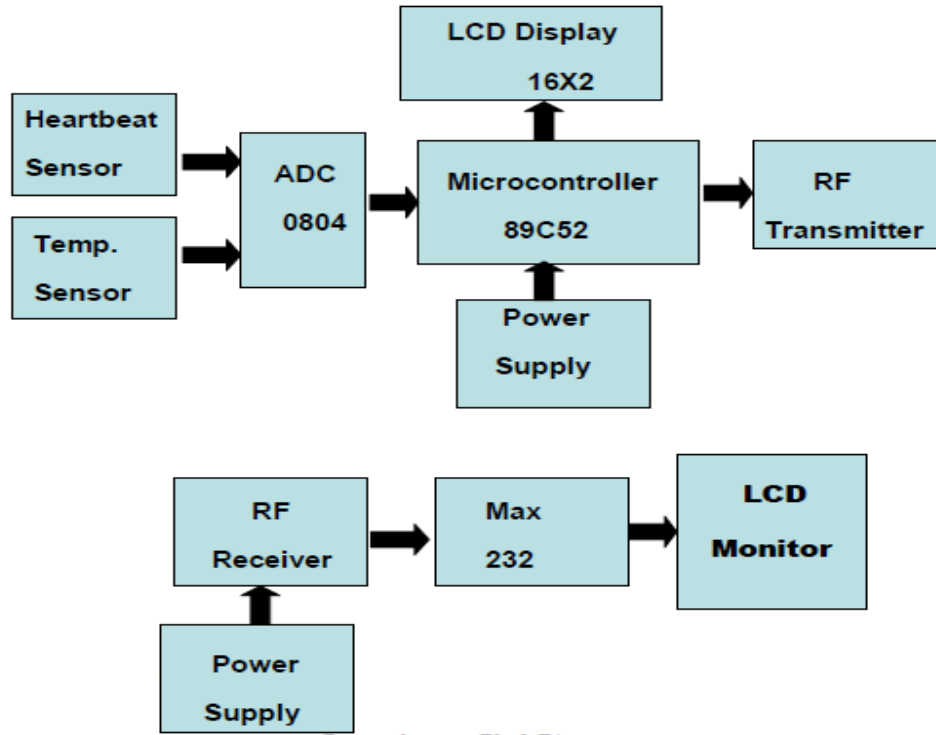


Figure 5 Proposed system Block Diagram [4].

Advantages

This type of systems provides different Benefits to Physicians like Improved diagnosis and better treatment management and Quick and timely follow-up of babies, Benefits to Patients and also Parents like Reduced visit to hospitals for long term follow-up care and Earlier discharge of patients (babies) leading to shorter length of stay in hospitals, and also provides Benefits Hospital like Significant reduction in unnecessary visits and Hospitalization for specialized care at tertiary hospitals [5].

III. CONCLUSION

Patient monitoring systems are a need of today’s generation and are helpful for every type of patient. This paper provides the review on latest patient monitoring system, which is developed in the recent years.

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