



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 5, May 2023

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

 9940 572 462

 6381 907 438

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 www.ijrset.com

Elder People and Bedded Patient Monitoring System Using Arduino Uno

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ABSTRACT: Today chronic diseases are the fastest rising diseases in the humans this may be caused due to a lot of reason like dietary habits, physical movement and unhealthy habits such as alcohol and cigarettes use. The design of this system creates integration of the real time continuous and long term health monitoring system to observe the biomedical parameters like heart rate, blood pressure, ECG, body temperature and pulse oximeter using biomedical sensors in the patient. The sensors are attached to the patient body. The parameters acquired from the patient are processed using arduino Uno controller board and transmitted to healthcare center via wi-fi module. The received biomedical parameters are compared with the predefined threshold values. If parameters is normal, then the parameters is stored in the database or else the alert message is sent with data to the doctor or the patient caretaker via wi-fi module.

KEYWORDS: chronic diseases, rising diseases, cigarette, alcohol, blood pressure, ECG, pulse oximeter, sensors, wi-fi module, database or alert message, patient caretaker via wi-fi module

I. INTRODUCTION

Now a days health monitoring is essential for all human beings. In recent years several technique is used for health monitoring purpose. Here I proposed a Wi-Fi based wireless sensor network for monitoring purpose. Because, it has both data acquisition and data transmission principle. Each of us requires a periodic monitoring of vital parameters and correct treatments based on this data. These processes become even more crucial when people reach a certain age and are not capable to follow their health condition properly without a special medical personnel or sophisticated equipment to perform the monitoring. Therefore, a particular interest is focused on continuous monitoring techniques. For

continuous monitoring, Atmega328 micro controller is used. In this case several sensor unit is considered. Namely, Temperature sensor, Heart beat rate sensor, human Blood pressure sensor. All of sensors are used only for sensing purpose. If the sensed value is equal to normal value, it stops further process. Otherwise it sends control signals to patient via Actuator.

wireless sensor networks (WSN) play a vital role in the research, technological community hence resulting in the development of various high-performance smart sensing system. Many new research is focused at improving quality of human life in terms of health by designing and fabricating sensors which are either in direct contact Health monitoring is an informal, non-statutory method of surveying your workforce for symptoms of ill health, including lower back pain. This type of occupational health management system can enable you, as an employer, to be aware of health problems and intervene to prevent problems being caused or made worse by work activities. Another important role of health monitoring is to give feedback into a system that reviews the current control methods in place.

Many architectures for remote health monitoring procedures were developed in the recent years such as smart phone based remote health monitoring application. In remote health care monitoring application we cannot make use of the available bandwidth successfully, if we use the traditional mode of transmitting the data continuously. It reduces the node life time, even leads to failure of data due to delay and buffer overloading, which is not acceptable

particularly in the health care application. The problems that occur due to the improper data association collected from patients have been discussed.

The architecture proposed consists of a central gateway which gathers the data from all the users and transmit it to the central server periodically, where clinicians can classify the user's health status. Therefore, a particular interest is focused on continuous monitoring techniques. Unlike the spot checking, this type of monitoring is able to providing a long term information about the patient, helps to record emergency situations and react effectively to any significant change in person's health conditions in a real time.

Health care is an important part of everyday life for all human beings on the planet. Each of us requires a periodic monitoring of imperative parameters and right treatments based on this data. These processes become even more crucial when people attain a certain age and are not able to follow their health condition properly without a special medical recruits or sophisticated equipment to perform the monitoring. The older person gets, the wider spectrum of possible diseases and unexpected emergency situations might occur. with the human body (invasive) or indirectly (noninvasive) in contact worked semi or completely self-sufficiently to perform a administration helpful to the prosperity of people and hardware

II. LITERATURE REVIEW

Tyagi [8] presented the various applications of ARDUINO and also mentioned some important parameters and functionalities of each of the applications in ARDUINO. They mainly concentrated on the roles and features of ARDUINO in healthcare. Also discussed on the technologies that make this ARDUINO possible in healthcare. In this paper, they have even proposed how cloud is also used for healthcare industry

Smart real time health monitoring system using Arduino and Raspberry Pi: The common problem we face these days is the lack of accurate health care for the elderly. There are many home-based health care monitoring systems but they are limited due to various setbacks. This work proposes a design of a health care monitoring system by using Arduino and Raspberry PI, to monitor the parameters i.e., heartbeat, body temperature, heart rhythm, and electrical activity. GPS module is used for tracking the location and camera for capturing live feed and an alert notification system that will notify the hospital and family if the values are abnormal and we can also check the real-time data in an app or a website that is incorporated into this module

In the olden days the patients' health was monitored by catching his /her hand by checking their pulses. As, the time passed on and the technology for monitoring health got introduced, the quality of measuring and understanding the health conditions got better. The development in the technology grew to such an extent that now a days by wearing a small device, patient's health is getting monitored. The below figure shows the evolution of medical equipment's

.Heart rate monitoring system using IR base sensor & Arduino Uno:

Presence of doctor is essential for proper patient care. But he cannot be present on each and every place to provide medication or treatment. So remote monitoring of a patient is the right solution. But the problem is availability of internet connection in a rural area. So this inspired us to use GSM module for this project since the telecom network is widely spread within rural & urban area of the India. This system is used to monitor physical parameter like heart beat and send 5 the measured data directly to a doctor through SMS. System consists of an IR base heart beat sensor, Arduino Uno & GSM module. This device will be able to measure heart beat from an infant to elder person. The low cost of the device will help to provide appropriate home base effective monitoring system

U. Anliker, J. A. Ward et.al Number of different research projects explores wireless sensor networks for monitoring patient health 24 hours. Few projects are concerned with developing wearable wrist worn belt, while others have developed based for monitoring individual patients during daily activity, at home, or in hospital. Han and Yuo et.al proposed wireless sensor network based e-health system based on radio-active and radio-passive positioning [1]. Authors proposed wireless sensor network application for 24 hours constant monitoring without disturbing daily activities of elderly people and their caretakers. In this system both fixed and mobile body sensors are used. A mixed

positing algorithm is proposed to determine the location of elderly person. The purpose of positing is to help the system to determine the person activities and further to make decisions about patient health condition

wearable medical monitoring and alert system aimed at people at risk from heart and respiratory diseases [2]. The system combines multiparameter measurement of vital signs, online analysis and emergency detection, activity analysis, and cellular link to a tele medicine centre in an unobtrusive wristworn device We are looking for technologies that can offer the ability of the healthcare system to reduce human efforts , .[1]by simplifying the treatment process as well as improving the quality of life for nurses and doctors is the challenging problems. Monitoring system is one of the most necessary systems in medical field, because it can help doctor diagnose and predict a symptom before making a plan for treatment. In addition to, monitoring system can be set to an alarm that work when the patient has abnormal behavior, we can also use the e- health system in the intensive care unit (ICU) and the patient who needs special observation.

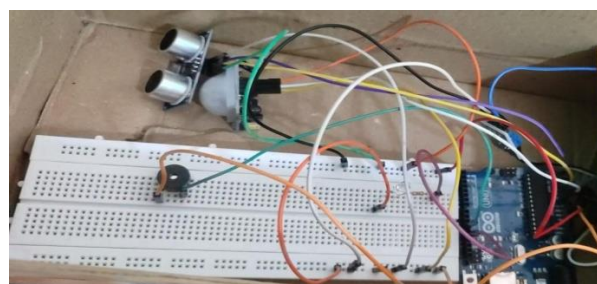
III. METHODOLOGY

We have developed a health monitoring system for elderly people living alone. We monitored the in-house movements of eight subjects by placing infrared sensors in each room of their homes. Because their movements were unrestricted, monitoring could last longer than other forms of monitoring. Continuous monitoring was performed for 80 months in total. We found that each subject had a specific pattern of movements. We estimated their health condition by comparing the duration of stay in specific rooms, such as the lavatory, with previously recorded data. If after analysis an unusual state was detected, we informed the family of the incident. Final decisions should be made by the family members, not automatically by computer software. For example, after contacting the subject or a neighbour by telephone, family members could call for an ambulance or arrange a visit by a doctor or home help. Thus, this system reduced anxiety for both the elderly subjects living alone and their family members.

IV. RESULTS AND DISCUSSION

The integrated health monitoring system with the different sensor performances are described in this section. The Monitor User Interface (MUI) is designed in such way that, the complete detail information of the patient and the doctor can be viewed to reduce the system complexity and to make it user friendly. The wired body sensors obtain the data from the patient body and the data is processed through arduino uno controller board which is connected to the sensors. The details of the patients and the doctors are stored in the database for further use.

The parameters such as monitor the patient moment and our disability; the complete summary of the patient health condition is generated. The patient health condition is compared with the predefined threshold value. If the condition or status of the patient health condition is abnormal, it is necessary to provide a prescription for respective health issues and also an immediate message has been sent to patient about his/her health status.





V. CONCLUSION

In this paper, we proposed a Wi-Fi based remote health monitoring and control system using atmega328 microcontroller, which is capable to continuously monitor the patient's heart beat, blood pressure and other critical parameters in the hospital. We also proposed a continuous monitoring and control mechanism to monitor the patient condition and store the patient statistics in server. For the performance valuation, simulation results are taken by using PROTEUS 7 simulation tool

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SJIF Scientific Journal Impact Factor

Impact Factor: 8.423



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