iJRASET
International Journal For Research in Applied Science and Engineering Technology

# INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

**Volume:** 5 **Issue:** III **Month of publication:** March 2017

**DOI:** http://doi.org/10.22214/ijraset.2017.3169

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)

# Reliable Automated Telemedicine System Using IOT

G. Sandra Karunya[1], Divya Rekha. A[2], Mamtha. P[3], K. M. Shilpa[4]
[1]Asisstant Prof(M.E), [2,3,4]Department of Computer Science and Engineering
Sri Muthukumaran Institute of Technology Chennai, India

***Abstract***: ***It has been always a challenging task for the researchers to incorporate information technology advancement in medical profession. The design and development of wearable biosensor system for health monitoring has garnered lots of attention in the scientific community and the industry during the last years. Wearable sensor-based systems will potentially transform the future of healthcare by enabling proactive personal health management and ubiquitous monitoring of a patient's condition .This paper attempts to comprehensively review the current research and development on wearable biosensor systems for health monitoring. Human-machine interaction is a step towards achieving this goal. The motive behind developing this interface is to sense early and accurately a seizure triggering, create an alarm system for the patient and his doctors and relatives whenever and wherever required.***
***Keywords***: ***biosensor, Wearable sensor, seizure.***

## I. INTRODUCTION

WEARABLE health-monitoring systems (WHMS) have drawn a lot of attention from the research community and the industry during the last decade as it is pointed out by the numerous and yearly increasing corresponding research and development efforts . As healthcare costs are increasing and the world population is ageing , there has been a need to monitor a patient's health status while he is out of the hospital in this personal environment. To address this demand, a variety of system prototypes and commercial products have been produced in the course of recent years, which aim at providing real-time feedback information about one's health condition, either to the user himself or to a medical center or straight to a supervising professional physician, while being able to alert the individual in case of possible imminent health threatening conditions. In addition to that, WHMS constitute a new means to address the issues of managing and monitoring chronic diseases, elderly people, postoperative rehabilitation patients, and persons with special abilities. Wearable systems for health monitoring may comprise various types of miniature sensors, wearable or even implantable. These biosensors are capable of measuring significant physiological parameters like heart rate, blood pressure, body and skin temperature, oxygen saturation, respiration rate, electrocardiogram, etc. The obtained measurements are communicated either via a wireless or a wired link to a central node, for example, a Personal Digital Assistant (PDA) or a microcontroller board, which may then in turn display the according information on a user interface or transmit the aggregated vital signs to a medical center. This illustrates the fact that a wearable medical system may encompass a wide variety of components: sensors, wearable materials, smart textiles, actuators, power-supplies, wireless communication modules and links, control and processing units, interface for the user, software, and advanced algorithms for data extracting and decision making. These wearable systems will keep the patient informed about his health system. These wearable systems, when integrated with the tele medicine system will be an important resource for diagnosing and monitoring the patient health by the medical personnel. The medical personnel can even alert the patient in case of any life threatening change. With the technological advancement, an excellent man machine interface like sensor networks will be an effective and affordable tool for taking care of old people. These days, smartphones with high processing power and memory from companies like Apple, Google, Samsung, etc. are very common. Using High Speed Networks, they can form an important constituent of a sensor network for mobile telemedicine system.

## II. RELATED WORK

### *A. WMSs in Authentication*

Wearable medical sensors (WMSs), which measure biomedical signals, e.g., heart rate, blood pressure, and body temperature, have drawn a lot of attention from researchers and begun to be adopted in practice . A recent report by Business Insider claims that 33 million wearable health monitoring devices were sold in 2015. It forecasts that this number will reach 148 million by 2019,and continue to grow rapidly thereafter. We suggest that, since such bio medical signals will be collected anyway for health monitoring

Volume 5 Issue III, March 2017
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

purposes, they can also be used to aid authentication. The use of continuously-collected biomedical data for user verification and identification seems promising for three reasons. First, if the biomedical signals are collected by WMSs for medical purposes, using them for authentication does not require any extra device that is not already on the body. Second, this information is collected transparently to the user, i.e., with minimal user involvement. Third, unlike traditional biometrics/behaviometrics, e.g., face features and keystroke patterns, information that may frequently become unavailable, the stream of biomedical signals collected by WMSs is always available when the person is wearing WMSs.

## III. SYSTEM ARCHITECTURE

All the hardware set up is made according to the block diagram(Fig 1).There are various sensors like Heart Rate Sensor, Temperature and Ultra sonic sensor which senses and send signal to Microcontroller. RFID tag is used for the purpose of identification of a person using radio waves. Camera is used as a interface for communication between patient and doctor.

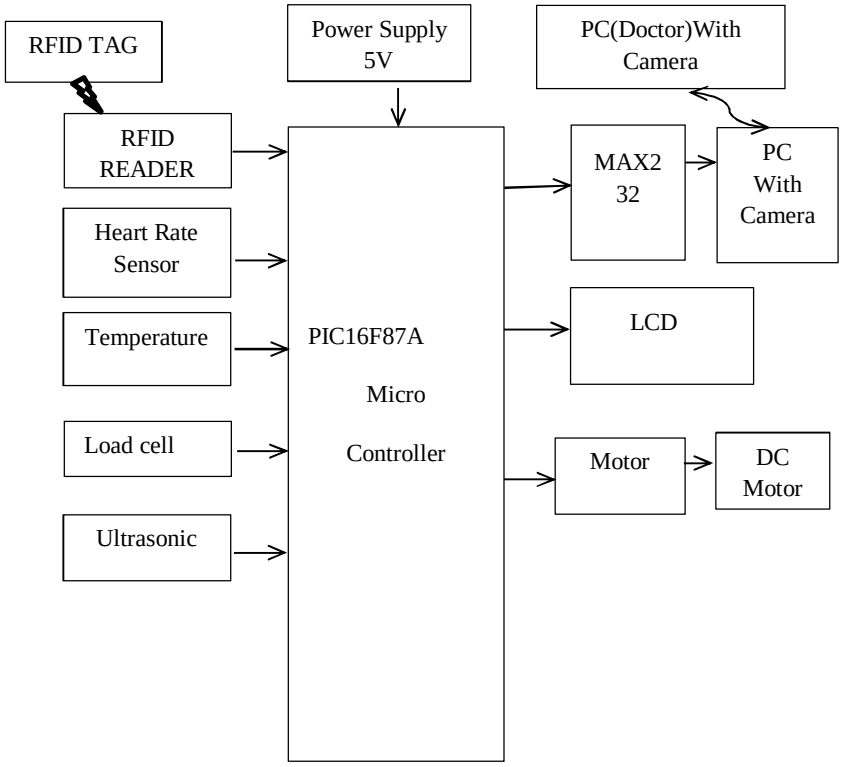



Fig Block Diagram

## IV. ADVANTAGE

This system is fully automated system and it is also reliable. It provides high security for health care information and it is more effective for health monitoring. It also provides remainder notification, being able to alert the individual in case of possible imminent health threatening conditions.

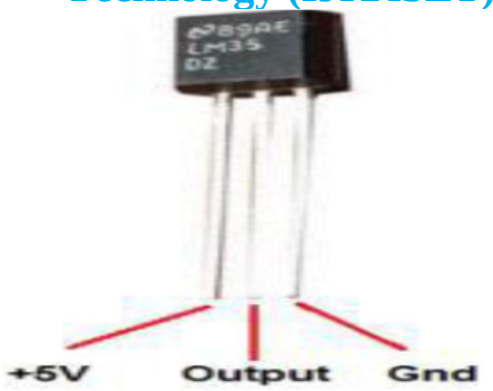
## V. BLOCK DESCRIPTION

### *A. Temperature Sensor*

Among the variety of temperature sensors available in the Market, LM35 is used for the implementation of the proposed System because of its advantages like accuracy, it produces high output voltages. Also it does not require any external calibration or trimming to provide typical accuracies of ±1⁄4°C at room temperature and ±3⁄4°C over a full −55 to +150°C temperature range. It has very low self-heating of less than 0.1°C in still air, as it draws only 60 µA from its supply. The LM35 is rated to operate over the temperature range −55° to +150°C.

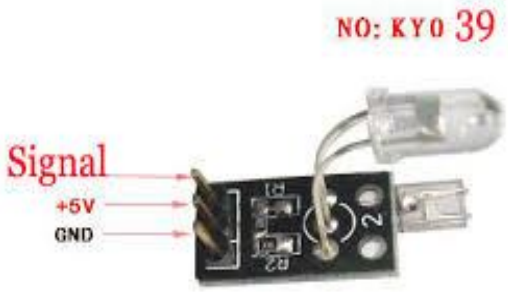
T=(A/1024*5000)/10

Volume 5 Issue III, March 2017
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)



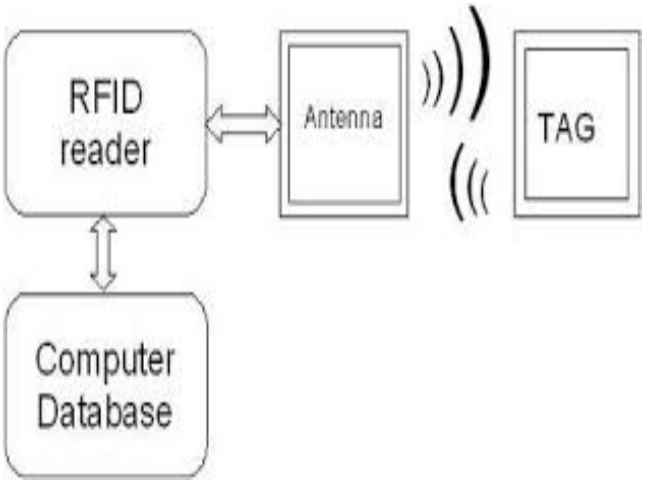

*B. Heart Rate Sensor*

Heart Beat can be measured based on optical power variation as light is scattered or absorbed during its path through the blood as the heart beat changes.




*C. RFID Tag And RFID Reader*

RFID Tags are attached to cash, clothing, and possessions, or implanted in animals and people, the possibility of reading personally-linked information without consent has raised serious privacy concerns. The tag's chip or integrated circuit(IC) delivers performance, memory and extended features to the tag. An RFID Reader is a network connected device(fixed or Mobile)with an antenna that sends power as well as data and commands to the tags. It acts like an access point for RFID tagged systems.

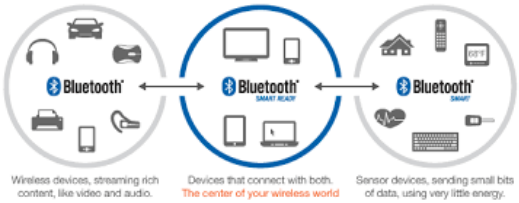



*D. Embedded Bluetooth Construction*

Bluetooth is a wireless technology standard for exchanging data over short distances from fixed and mobile devices, creating personal area networks (PANs) with high levels of security. It can connect several devices, overcoming problems of

Volume 5 Issue III, March 2017
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

synchronization.



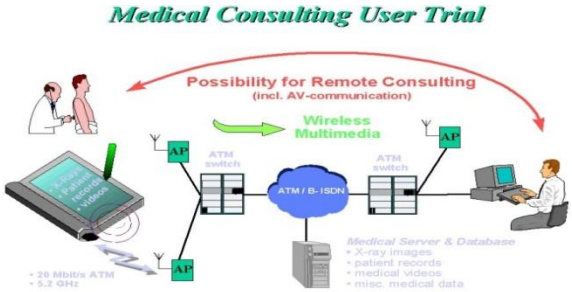

## VI. MODULES

### A. *Module-I*

In this module user must be registered to access the application. The registration details includes design fields like User name, Password, Phone and other information with User's medical reports and also register to the doctor name, phone number and which specialist in medical field.

Various sensors like heart beat sensor, temperature sensor and ultrasonic sensor are also connected to the machine for user's health monitoring.

The server will monitor the entire user's information and doctor information in their database and verify them if required. The server stores the entire user's information and also updates each user's activities in the database.




### B. *Module-II*

In this module, design and implementation of bio medical analysis(Bio Aura).Application is installed in both ends for voice communication and chatting with doctor about health.

In this module we implement disease analysis system in which data can be analysed, so that we can predict the disease based on given symptoms. This module interact with server for analysis whereas the analysiation is done by researchers. It also dispatches medicines from system to the user.

The TABLE-I describes about biostreams, their abbreviations/notations and units. Bio-stream, a real-time, operator-based software solution for managing physiological sensor streams.

The Biostream system can be used for real-time remote monitoring and alert applications, long-term studies, and data mining. This system can be used to detect life-thretening events, such as heart attacks and strokes.

TABLE-I

BIOSTREAMS, THEIR ABBREVIATIONS/NOTATIONS, AND UNITS

| Biostream | Abbreviations/Notations | Unit |
|---|---|---|
| Electroencephalogram | EEG | $\mu V$ |
| Electrocardiogram | ECG | $\mu V$ |
| Blood glucose | BG | $mg/dL$ |
| Arterial systolic blood pressure | ABPSYS | $mmHg$ |
| Arterial diastolic blood pressure | ABPDIAS | $mmHg$ |
| Arterial average blood pressure | ABPMEAN | $mmHg$ |
| Heart rate | HR | $1/min$ |
| Pulmonary systolic artery pressure | PAPSYS | $mmHg$ |
| Pulmonary diastolic artery pressure | PAPDIAS | $mmHg$ |
| Body temperature | T | $Celsius$ |
| Oxygen saturation | SPO2 | % |
| Respiratory rate | RESP | $1/min$ |

## VII. RESULT

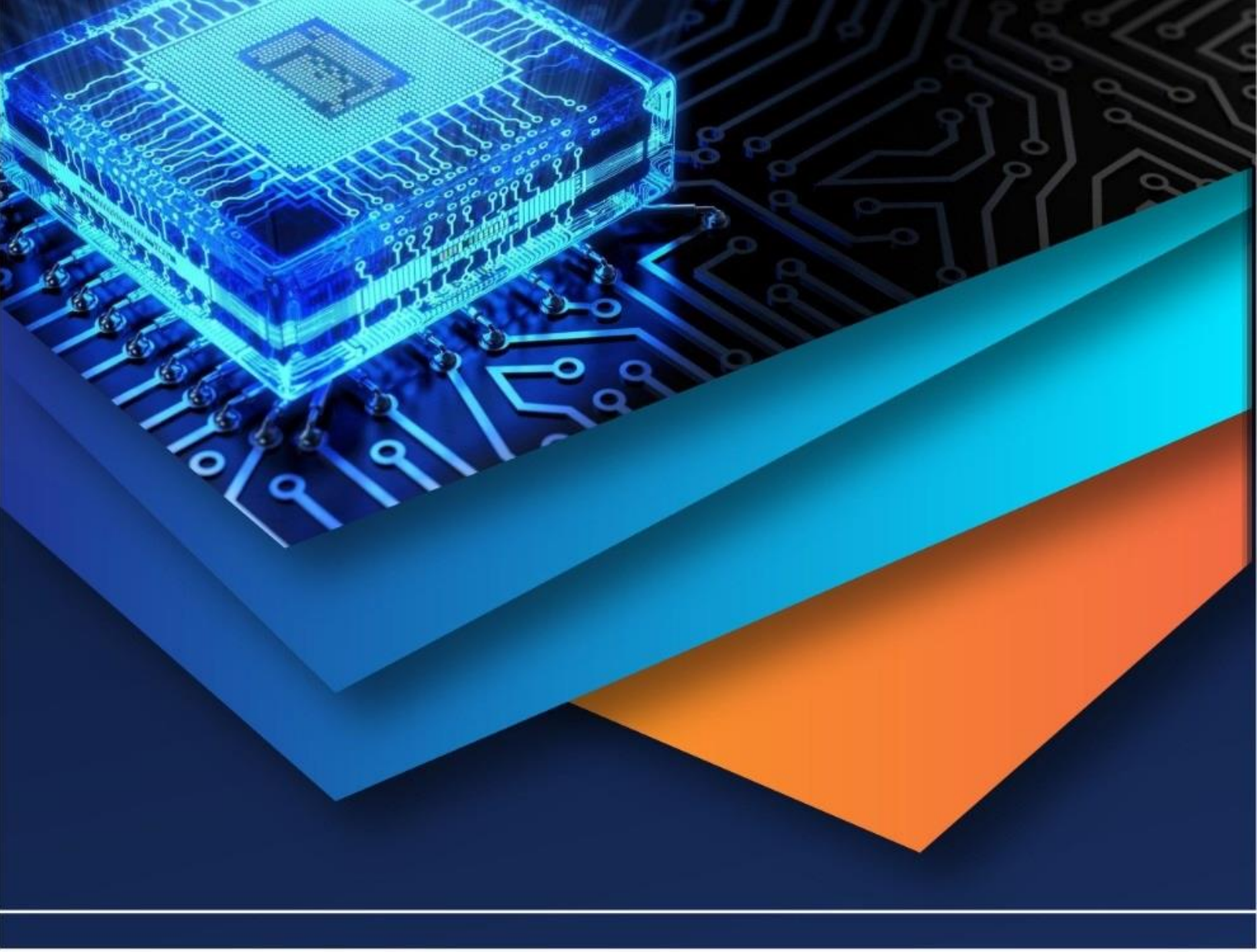
In this paper Wi-Fi Technology is applied. We proposed this system, which can be used for the interactive communication between elderly people and younger generation using IOT. We confirmed that elderly people could retrieve and transmit information by voice via this system only by simple finger operation within reasonable response time.

## VIII. FUTURE WORK

The Health monitoring system can be further improved by installing ATM machine like instrument in Rural place for better Medical Treatment and Diagnosis for rural people. We will change the box type system to a human type one which is more familiar with elderly people.

## REFERENCES

[1] Pantelopoulos and N. G. Bourbakis, "A survey on wearable sensor based systems for health monitoring and prognosis," IEEE Trans Systems, Man, and Cybernetics, vol. 40, no. 1, pp. 1–12, 2010.
[2] Mohammad Siraj, Syed M. Umair "An epileptic sensor network over high speed networks"in Proc.IEEE Int. Conf. Reliability,Infocom Technologies and Optimization(ICRITO),pp.625-629,2016.
[3] Koichiro Niinuma,Unsang Park and Anil K.Jain"Soft biometric traits for continuous user authentication"IEEE Transactions On Information Forensics And Security,vol.5,no.4,2010.
[4] Alexandros Pantelopoulos and Nikolaos G.Bourbakis "Prognosis-A wearable health-monitoring system for people at risk:methodology and modeling" IEEE Transactions on Information Technology In Biomedicine,vol.14,no.3,2010.
[5] U. Varshney, "Pervasive healthcare and wireless health monitoring,"Mobile Networks and Applications, vol. 12, no. 2-3, pp. 113–127, 2007.
[6] M. Teplan, "Fundamentals of EEG measurement," Measurement Science Review, vol. 2, no. 2, pp. 1–11, 2002.
[7] E. B. Mazomenos, D. Biswas, A. Acharyya, T. Chen, K. Maharatna,J. Rosengarten, J. Morgan, and N. Curzen, "A low-complexity ECG feature extraction algorithm for mobile healthcare applications," IEEE.J. Biomedical and Health Informatics, vol. 17, no. 2, pp. 459–469, 2013.
[8] Terence Sim,Sheng Zhang,Rajkumar Janakiraman and Sandeep Kumar "Continuous verification using multimodal biometrics" IEEE Transactions On Pattern Analysis And Machine Intelligence,vol.29,no.4,2007.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

# INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY