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Non-Invasive Glucose Monitoring And ECG Detection using Red Tacton

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Abstract: *Diabetes mellitus claims many lives each year. It influences the body in different ways by prompting numerous genuine sicknesses and untimely mortality. In addition to diabetes mellitus Cardiovascular disease causes death and disability and a primary cause of acute hospital bed days and physician visits. The aim of this research work is to mark an instantaneous noninvasive small, compact and minimal effort gadget to monitor glucose and to detect ECG signal with the help of the Bio-medical sensors which makes it totally versatile.*

Keywords: Compact and minimal effort gadget; High speed network transmission; Secured data

I. INTRODUCTION

One of the main challenges in recent years has been the increase in the elderly population in developed countries. The need to provide quality, care and service in these countries for a rapidly growing population of elderly people, while reducing the healthcare costs is an important issue for the government and health service providers. Wireless sensor network (WSN) technologies have the potential to change our lifestyle with different applications in different fields. The combination of wireless sensors and sensor networks with computing and artificial intelligence research have built a concept of ambient intelligence in order to overcome the challenges we face in everyday life.

Wearable and implantable body sensor network systems are one tool to achieve this objective, as a prominent application in these areas in the integration of sensing and consumer electronics technologies which would allow people to be monitored during their everyday activities. It helps people providing healthcare services such as medical monitoring, memory enhancement, control of home appliances, medical data access, and communication in emergency situations. Continuous monitoring with wearable and implantable conditions and diseases in risk patients provides a wide range of healthcare service for people with various degrees of cognitive and physical disabilities.

II. RELATED WORKS

In[8] Noncontact Wearable Wireless ECG Systems for Long-Term Monitoring a wireless ECG monitoring system is developed using flexible and dry capacitive electrodes for long-term monitoring of cardiovascular health.

In[5] A Portable Wearable Tele-ECG Monitoring System is a fast and uninterrupted telemonitoring system which has the potential to improve the patient's life quality by providing a psychological reassurance.

In[2] Wearable Armband Device for Daily Life Electrocardiogram Monitoring device has a good potential for daily life HR monitoring, especially for applications such as arrhythmia or seizure detection, stress assessment, or sleep studies.

In[6] Energy Efficient Intelligent ECG Monitoring for Wearable Device significantly reduces the power consumption in ECG diagnosis and transmission while maintaining high accuracy.

In[3] Secured Data Management in Cloudlet Assisted IoT Enabled e-Health Framework in Smart City shows evaluation results of our proposed model performing far better than existing cloud-based e-Health solutions.

In[7] Differntial Continous Wave Photoacoustic Spectroscopy for Non-Invasive Glucose Monitoring shows high potential for use in a non-invasive BGL sensor.

In[1] Cloud Computing based Non-Invasive Glucose Monitoring for Diabetic Care facilitates implementation of computationally intensive calibration tasks and the storage and analysis of monitoring.

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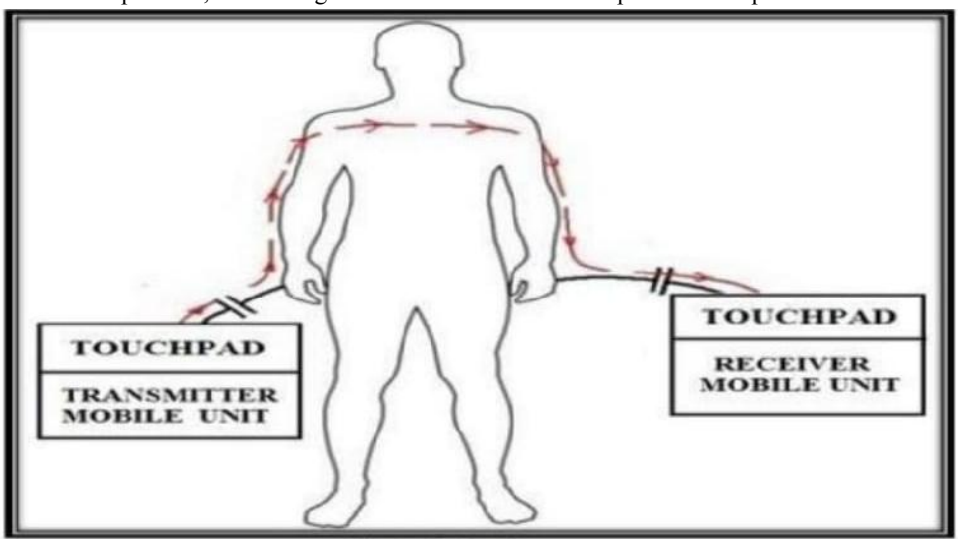
In[4] IoT-Based Smart Edge for Global Health; Remote Monitoring with Severity Detection and Alert Transmission is a significant step toward addressing the requirements for global health.

III. Proposed System

Red Tacton is a Human Area Networking (HAN) technology that uses the surface of the human body as a safe, high speed network transmission path. It is completely distinct from wireless and infrared technologies as it uses the minute electric field emitted on the surface of the human body. A transmission path is formed when a part of the human body comes in contact with Red Tacton transceiver. Communication is possible using any body surface such as the hands, fingers, feet, face, legs or torso.So, in this paper we are explaining the unique new functional features and enormous potential of Red Tacton as a break-through Human Area Networking technology.

3.1 Design Consideration

Red Tacton is a device that connects the personal computer and Arduino microcontroller. The Arduino controller is connected with Non-Invasive glucose sensor, ECG Sensor, Temperature sensor and Liquid crystal display. The TTL and RS232 Level converter is used for serial communication. Thus the pulse signal is travelled via the human through Red Tacton and the Temperature, ECG and glucose values are read in the personal computer.



3.2 Description of Proposed Algorithm

The three analog sensors named Temperature sensor, Non-Invasive Glucose sensor and ECG sensor are connected with the microcontroller, and here we have used Arduino. This sensors detects Temperature ,Glucose and Heart rate levels and gives the output to the Arduino. This microcontroller converts it into a proper values. These values are then displayed in the Liquid Crystal Display. Redtacton transmitter ,which is connected with the LCD ,will have a probe and on the other hand, Red tacton receiver, which is connected with the personal computer via the serial communication cable, will also have a probe. As soon as the human body have a contact with the probe the connection will be established and the data will be transmitted through the human body as a medium and these data are travelled by means of induced electrical signals. Thus the values will be displayed in the personal computer with the highest security.

IV. Result

The values of the Temperature, Blood Glucose and ECG are measured by the Temperature sensor, Blood Glucose sensor and ECG sensor respectively. These values are displayed by using the Liquid Crystal Display attached with the Arduino.

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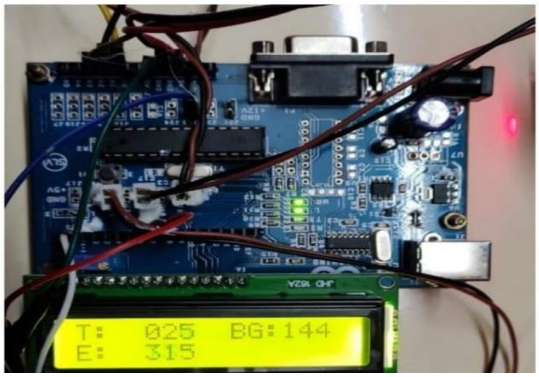
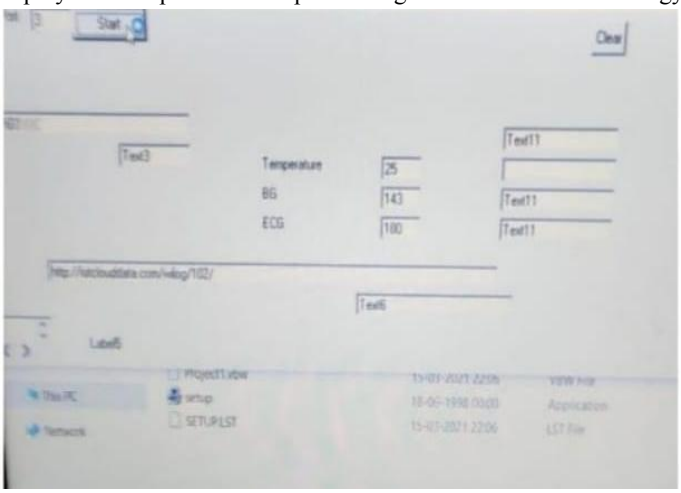


Thus these are the values displayed in the personal computer using the Red Tacton technology.



V. Conclusion and Future Enhancement

The results indicate that there is significantly different transmission gain among individuals, and the transmission gain for the same individual is steady over a period of time. Therefore, the model proposed in this paper may be a potential solution for rapid verification for wearable devices. Thus the design of Blood Glucose, ECG and Temperature monitoring device is implemented and tested successfully. The Glucose concentration, Heart Rate and the Temperature are measured using the Non-Invasive Glucose sensor, ECG sensor and Temperature sensor.

In the near future, the biometric verification based on HBC will be achieved in a wearable prototype. Generally, customary techniques are utilized to measure Glucose content in the Circulatory System which is agonizing and makes trouble and disturbance the patient. The ability of systems to screen Glucose non-intrusively demonstrates an alluring course towards advancing the administration of Diabetes. Once the output is done, we will try to improve the efficiency of it and will extend this work to a new technology

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