Design and Implementation of Low Cost ECG Monitoring System for the Patient using Smart Device

ABSTRACT

Cardiovascular disease (CSD) has become the leading cause of death worldwide in recent years. This CSD is the most challenging problem for detection or identification in early stages of patients. This research work approaches to develop an ECG signal generator at very low cost for the patients who can receive his/her ECG signal and detect the probability of cardiovascular diseases instantly. This ECG signal is transmitted via Bluetooth/Wi-Fi/Zigbee module to smart device with support software simulation where feature extraction and detection algorithm is setup for cardiovascular disease. This network can be connected with the doctors and hospitals to get the fastest treatment. In this paper, we have also proposed extraction and detection algorithm for detecting of CSD. This proposed idea is to contribute to bring under control heart diseases and also act as an expected results in health care service to patients in remote area.

EXISTING SYSTEM

- In existing system, a home based cardiac monitoring system is proposed.

- They have established an electrocardiogram (ECG) beat detector which is configured by the PDA version of Personal Health Information Management System.

- They develop a monitoring ECG system where the patients have none of their own smartphone.

PROPOSED SYSTEM

- We propose unguided network design for low cast portable ECG system to generate ECG signal from patient.

- The signal is passed from the signal generator circuit to the smart device where cardiovascular disease is detected by feature extraction and detection algorithm.

- This data transfer via Bluetooth/Wi-Fi/Zigbee module is also connected with smart device such as Tablet/Notebook PC.

- The main advantage of this system that there is no need of any kind of broadband connection because the system does not pass the ECG signal to any database to compare with other signals and to detect diseases.

SYSTEM REQUIREMENTS

SOFTWARE REQUIREMENTS

- Keil/Arduino IDE

REFERENCE

[1] N.Goldschlager, *Principles of Clinical Electrocardiography, Appleton & Lange*, 13th edition, ISBN 978-083-8579-510, June 1989, Connecticut, USA.

[2] K. W. Goh, J. Lavanya, Y. Kim, E. K. Tan, and C. B. Soh, "A PDA based ECG beat detector for home cardiac care," *27th Annual Conference Shanghai, IEEE. Engg. in Med And Biology, China, pp. 375-378,* September 1-4, 2005.

[3] K. Shin, H.T. Hwang, H.Y. Kim, J.P.. Kim, H.S. Yeo, and W. Han, "WHAM: A novel wearable heart activity monitor based on Laplacian potential mapping," *27th Annual Conferrence, IEEE. Engg. In Med and Biology, Shanghai, China, pp. 7361-7364. September 1-4,2005.*

[4] G. Gimenez, J. Guixeres, F.J. Villaescusa, J. Saiz, S. Merce, and R. Rodriguez, "A New System for Integral Community Cardiac Rehebilitation Based on Technological Platforms for the lifestyle Change Supporting System," *ISSN. Computers in Cardiology, pp. 845-848, 2006.*

[5] H. Lars, E. Andreas, and I. Halfdan, "Cardiac Monitoring Using Transducers Attached Directly to the Heart," *IEEE International Ultrasonic Symposium, pp. 749-752, 2008.*