Abstract

The Electrocardiogram signals are a very valuable source of data for physicians in diagnosing heart abnormalities. In this paper, we present an efficient technique for compression of electrocardiogram (ECG) signals. A new thresholding method based on the three level of quantization is proposed for encoding samples using an Embedded Zero-tree Wavelet (EZW) and Huffman algorithms. The modified encoding algorithm allows an optimal data compression for a target bit rate and appeared superior to other wavelet-based ECG coders. Also, to improve the efficiency of the proposed method we propose to use different types of wavelet and compare their performances for compression of the ECG signals. Experimental results show that the proposed method has a good performance and less complexity for compression of ECG database from MIT-BIH database different types of wavelet transform.

References

ECG Compression using the Three-Level Quantization and Wavelet Transform


- C. M. Fira and L. Goras, "An ECG signals Compression Method and its
Validation using NNs

- S. M. E Sahraeian and E. Fatemizadeh, "Wavelet-Based 2-D ECG Data Compression Method Using SPIHT and VQ Coding," IEEE Int. Conf on &quot;Computer as a tool&quot; , EUROCON 2007.
- Ranjeet Kumar, A. Kumar, Rajesh K. Pandey, "Beta wavelet based ECG signal compression using lossless encoding with modified thresholding," Computers and Electrical Engineering (Elsevier 2012)
- Jianhua Chen, Fuyan Wang, Yufeng Zhang, Xinling Shi, "ECG compression using uniform scalar dead-zone quantization and conditional entropy coding," Medical Engineering & Physics (Elsevier), 30-2008, pp. 523–530
- Jin Wang, Xiaomei Lin and Kebing Wu "ECG Data Compression Research Based on Wavelet Neural Network" 2010 International Conference on Computer, Mechatronics, Control and Electronic Engineering (CMCE)

Index Terms
Computer Science  Signal Processing

Keywords
Discrete Wavelet Transform (DWT)  EZW  Huffman Coding  Three-Level Quantization