

Abstract: Deployment of Adaptive Filter-set in Wearable ECG Monitoring System

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Abstract

In this paper, adaptive filter with optimal filter coefficients selection is proposed for motion artifact removal. An ultra-small chest belt-mounted ECG system with 3-axis accelerometer is implemented for ECG and activity monitoring in daily life. The implemented ECG system is also embedded with a Bluetooth transceiver to provide a feature of wireless monitoring. In fact, ECG signal is often distorted due to different state of activity. When there is a lot of movement, the signal distortion is high and there is low accuracy in detecting R-peak in ECG. Therefore we propose a methodology to look for the filter coefficients base on different state of activity. The state of activity is classified by a self-proposed fuzzy rule-based system. Then, a set of high pass filter coefficient is applied base on different state of activity. In the case of low activity state, low high pass filter coefficient is used, whereas, in the case of high activity state, a high pass filter coefficient is used. The experiment result shows significant improvement of R-peak detection accuracy during fast movement activity state.

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