

عنوان مقاله:

Electrocardiogram Signals Denoising Using Improved Variational Mode Decomposition

محل انتشار:

مجله سیگنالها و سنسورهای پزشکی، دوره 11، شماره 2 (سال: 1400)

تعداد صفحات اصل مقاله: 8

نویسندگان:

Vikas Malhotra - *Department of Electronic and Communication Engineering, University School of Engineering and Technology, Rayat Bahra University, Mohali, Punjab*

Mandeep Kaur Sandhu - *Department of Electronic and Communication Engineering, University School of Engineering and Technology, Rayat Bahra University, Mohali, Punjab*

خلاصه مقاله:

Background: Electrocardiogram (ECG) plays a vital role in the analysis of heart activity. It can be used to analyze the different heart diseases and mental stress assessment also. Various noises, such as baseline wandering, muscle artifacts and power line interface disturbs the information within the ECG signal. To acquire correct information from ECG signal, these noises should be removed. Methods: In the proposed work, the improved variational mode decomposition (IVMD) method for the removal of noise in ECG signals is used. In the proposed method, the weighted signal amplitude integrated over the timeframe of the ECG signal varies the window size during decomposition. Raw ECG data are extracted from 10 subjects and ECG data are also taken from the MIT BIH database for the proposed method. Results: The performance comparison of traditional variational mode decomposition (VMD) and the proposed technique is also calculated using mean square error, percentage root mean square difference, signal to noise ratio and correlation coefficient. The extracted highest signal to noise ratio (SNR) value of acquired ECG signals using traditional VMD is ۲۲db whereas highest value of signal to noise ratio (SNR) using improved VMD (IVMD) is ۸۳db. Conclusion: The proposed IVMD technique represented better performance than traditional VMD for denoising of ECG signals.

کلمات کلیدی:

Denoising, electrocardiogram, variational mode decomposition

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1700126>

