سیویلیکا - ناشر تخصصی مقالات کنفرانس ها و ژورنال ها
گواهی ثبت مقاله در سیویلیکا
CIVILICA.com

عنوان مقاله:

Real-Time Fast Fourier Transform-Based Notch Filter for Single-Frequency Noise Cancellation: Application to Electrocardiogram Signal Denoising

محل انتشار:

مجله سیگنالها و سنسورهای پزشکی, دوره 11, شماره 1 (سال: 1400)

تعداد صفحات اصل مقاله: 10

نویسندگان:

Anis Ben Slimane - *Laboratory of Advanced Technology and Intelligent Systems, Sousse University, Sousse- Department of Industrial lectronics, National Engineering School of Sousse, Sousse University*

Azza Ouled Zaid - *SysCom Laboratory, National Engineering School of Tunis, University of Tunis El Manar, Tunis, Tunisia*

خلاصه مقاله:

Despite the considerable improvement of the common-mode rejection ratio of digital filtering techniques, the electrocardiogram (ECG) traces recorded by commercialized devices are still contaminated by residual power line interference (PLI). In this study, we address this issue by proposing a novel real-time filter adapted to single-frequency noise cancellation and automatic power line frequency detection. The filtering process is principally based on a point-by-point fast Fourier transform and a judicious choice of the analysis window length. Intensive experiments conducted on real and synthetic signals have shown that our filtering method offers very clean ECGs, due to the suppression of spikes corresponding to the PLI and the preservation of spikes outside the filter band. In addition, this method is characterized by its low computational complexity which makes it suitable for real-time cleaning of ECG .signals and thus can serve for more accurate diagnosis in computer-based automated cardiac system

کلمات کلیدی:

Frequency detection, notch filter, physiological signals, power line interference removal, real-time fast Fourier transform, spectral filtering

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/1700121