Abstract

This work investigates the application of the Ensemble Empirical Mode Decomposition (EEMD) and the time-frequency techniques for treatment of the electromyography (EMG) signal. The EMG signals are usually corrupted by artifacts that hide useful information then the extraction of high-resolution EMG signals from recordings contaminated with background noise becomes an important problem. The Ensemble Empirical Mode Decomposition (EEMD) is used for overcoming the noise problem. Due to the non-stationary of EMG signals, the analysis of this signal with the time-frequency techniques is inevitable. These time-frequency techniques are capable to reveal and extract the multicomponents of the EMG signal. The different time-frequency techniques used in this work are parametric techniques such as Periodogram, Capon and Lagunas and non-parametric such as Smoothed Pseudo Wigner-Ville and Hilbert
Periodogram and Ensemble Empirical Mode Decomposition Analysis of Electromyography Processing

Spectrum. These time-frequency techniques were applied to a normal and abnormal EMG signals, these signals were taken from patients with neuropathy and myopathy pathologies respectively. The results show that The Periodogram technique presents a powerful tool for analyzing the EMG signals. This study shows that the combination of the EEMD and the Periodogram techniques are a good issue in the biomedical field.

References

- Özgen, M. T. 2003. Extension of the Capon’s spectral estimator to
Periodogram and Ensemble Empirical Mode Decomposition Analysis of Electromyography Processing


- Castanié F. 2006. Spectral Analysis Parametric and Non-Parametric Digital Methods, (ISTE Ltd, USA, pp. 175-211.


Index Terms

Computer Science

Signal Processing
Keywords

EEMD  Time-frequency  Periodogram  Capon  Lagunas  SPWV  Hilbert spectrum

EMG