Abstract

The principle difficulty with the analysis of the heart rate variability (HRV) is that heart rate dynamics are non-linear and non-stationary. Detrended fluctuation analysis (DFA) and correlation dimension (CD) are non-linear HRV measures to quantify fractal-like autocorrelation properties and to characterize the complex behaviour of nonlinear time series. Optimal ECG sampling rate is an important issue for accurate quantification of HRV. High ECG sampling rate
results in very high processing time and low sampling rate produces signal quality degradation
results in clinically misinterpreted HRV. In this work the impact of ECG sampling frequency on
non-linear HRV have been quantified in terms of short-range & long-range DFA and CD on
short-term (N=200), medium-term (N=500) and long-term (N=1000) data. Non-linear HRV
parameters are found to be sensitive to ECG sampling frequency and effect of sampling
frequency will be a function of data length.

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Index Terms

Computer Science  Information Sciences

Keywords
Optimal ECG Sampling Rate for Non-Linear Heart Rate Variability