



Extraction of Heart Rate Variability from Seismocardiography (SCG)

Heart Rate Variability (HRV) is the variation of time interval between the heart-beats. This signal provides significant information about the heart situation. Seismocardiography (SCG) is the non-invasive recording of body vibrations induced by the heartbeat, it might be possible to extract HRV from this signal. Most studies used electrocardiography (ECG) to extract HRV signal.

The aim of this study is to extract HRV signal from a SCG signal. To achieve this aim, phonocardiography (PCG) signal should be extracted firstly. PCG signal is caused by the acceleration and deceleration of blood and turbulence developed during rapid blood flow. Usually, cardiologist record PCG and SCG signals separately. The novelty of this work is to show the SCG signal contains the PCG signal.

Wavelet method can be used for doing signal processing part and extract PCG signal, then apply Hilbert transform to extract HRV. At the end, the two different HRVs would be compared, that are extracted from ECG and SCG signals. The database would be possible to use.

Requirements:

- Basic knowledge of signal processing
- Programming experience in R or Matlab

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