Digital Signal Processing Techniques for Removing Noise from ECG Signal

ABSTRACT

Signal processing today is performed in vast majority of systems for ECG analysis and interpretation. An electrocardiogram records the electrical signal from the heart to check for different heart conditions and provides significant information about heart functionality. But during this process ECG signals are susceptible to noises. Its amplitude and duration can be corrupted by various types of noises, which sometimes leads to misdiagnosis. Hence noise reduction represents another important objective of ECG signal processing. In this project Baseline Wander, Powerline Interface and Electrode Motion Artifact noises can be removed by using MATLAB software. Baseline Wander is a low-frequency noise around 0.5 to 0.6 Hz. To remove it, a high-pass filter of cut-off frequency 0.5 to 0.6 Hz can be used. Powerline Interface is of frequency 50 or 60 Hz can be removed by using a Notch Filter of 50 or 60 Hz cut-off frequency. Electrode Motion Artifacts are of range 1 to 10 Hz can be suppressed based on adaptive filters. In addition to this QRS detection will be performed for our obtained ECG signal. The QRS detection detects peaks of the filtered ECG signal.

KEYWORDS:

ECG, Baseline Wander, Powerline Interface, Electrode Motion Artifact, QRS detection.

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