

Filtering corner frequency using Undecimated Wavelet Transform for surface EMG

ABSTRACT

Surface electromyography is a non-invasive electrical potential from human muscle. The signals are easily disturbed by many interference and noise. Lower frequency range of surface electromyography needs to be eliminated due to motion artefacts, instability and unpredictable fluctuation. There is no standard range of corner frequency and it highly depends on the dynamic movement during surface EMG signal collection. Adding high pass filter active or digital may require more cost or computation; yet, sometimes is unable to remove all corner frequency noises. This paper presents a new method in filtering the remaining corner frequency after conventional filter is employed, using Undecimated Wavelet Transform (UWT). Results show that the decomposing surface EMG signals, which are at 1400 Hz frequency sampling of surface EMG signal and at six levels decomposition, are suitable for setting the highest corner frequency within the range of 0-20Hz. Hard threshold de-noising technique and method of UWT reconstruction enable the easy removal of 20Hz corner frequency noise of surface EMG employing the stated parameter.

Keyword: Corner frequency; De-noising; Surface electromyography; Undecimated wavelet transform

