

Effects of Array Electrode Placement on Identifying Localised Muscle Fatigue

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Abstract : Surface electromyography (sEMG) is utilised in numerous studies on muscle activity. In the beginning, single electrodes were utilised; however, the newest approach is to use an array of electrodes or a grid of electrodes to improve the accuracy of the recorded reading. This research focuses on electrode placement on the biceps brachii, using an array of electrodes placed longitudinal and diagonally on the muscle belly. Trials were conducted on four healthy males, with sEMG signal acquisition from fatiguing isometric contractions. The signal was analysed using the power spectrum density. The separation between the two classes of fatigue (non-fatigue and fatigue) was calculated using the Davies-Bouldin Index (DBI). Results show that higher separability between the fatigue content of the sEMG signal when placed longitudinally, in the same direction as the muscle fibers.

Keywords : array electrodes, biceps brachii, electrode placement, EMG, isometric contractions, muscle fatigue

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