

Investigation of Surface Electromyograph Signal Acquired from the around Shoulder Muscles of Upper Limb Amputees

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Abstract : Surface electromyography is a strategy to measure the muscle activity of the skin. Sensors placed on the skin recognize the electrical current or signal generated by active muscles. A lot of the research has focussed on the detection of signal from upper limb amputee with activity of triceps and biceps muscles. The purpose of this study was to correlate phantom movement and sEMG activity in residual stump muscles of transhumeral amputee from the shoulder muscles. Eight non-amputee and seven right hand amputees were recruited for this study. sEMG data were collected for the trapezius, pectoralis and teres muscles for elevation, protraction and retraction of shoulder. Contrast between the amputees and non-amputees muscles action have been investigated. Subsequently, to investigate the impact of class separability for different motions of shoulder, analysis of variance for experimental recorded data was carried out. Results were analyzed to recognize different shoulder movements and represent a step towards the surface electromyography controlled system for amputees. Difference in F ratio ($p < 0.05$) values indicates the distinction in mean therefore these analysis helps to determine the independent motion. The identified signal would be used to design more accurate and efficient controllers for the upper-limb amputee for researchers.

Keywords : around shoulder amputation, surface electromyography, analysis of variance, features

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