Development of dry textile electrodes for electromiography a comparison between knitted structures and conductive yarns

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The paper presents a practical approach concerning the design, implementation and testing of dry textile electrodes for surface electromyography purposes. Several knitted structures were designed and knitted with conductive yarns, in order to compare the influence of the fabric structure in the electrode performance. The effect of the type of conductive yarn was also studied by comparing three different yarns. It was found that the textile electrodes perform well for sEMG acquisition, with a clear depiction of the muscle activity produced. There are significant differences between the structures tested and there is also some influence from the yarn used.

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I. Introduction

Surface electromyography (sEMG) refers to the recording of electrical activity of muscles. sEMG electrodes converts bio signals that results from muscle or nerve depolarization into an electrical potential that is then amplified. Instrumentation to measure EMG signals requires a three-stage system: an input that picks up the electrical potentials from muscle contractions -the electrodes -a signal conditioning stage that conditions and amplifies the signals, and an acquisition stage that converts the signals into audio or visual data to be then analyzed [1].

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