The comparison of electromyographic pattern classifications with active and passive electrodes

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摘要

Abstract

Electromyographic (EMG) signals are usually acquired using surface electrodes, and they commonly serve as the control sources of myoelectric prosthetic limbs. The use of passive electrodes and amplifiers with adjustable gain is very popular in laboratories for the development of new control strategies. However, active electrodes without conductive jelly are used in most clinical applications of myoelectric hand control. There remains an important question: Are there any differences between usingactive and passive electrodes in EMG pattern classifications? Autoregressive and cepstral coefficients were used to evaluate recognition rates via both types of electrodes. The results showed that the estimated recognition rates in the passive electrodes were comparable to those in the active ones (averaged recognition rate, 88.5 vs. 85.84% in the autoregressive coefficients, and 84.84 vs. 83.5%, in the cepstral coefficients, respectively). Aside from the lack of significant statistical differences between them, the results imply that the differences between the recognition rates via these electrodes could be negligible. This would be helpful for the myoelectric control of assistive devices