

عنوان مقاله:

Detecting and Predicting Muscle Fatigue during Typing By SEMG Signal Processing and Artificial Neural Networks

محل انتشار:

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خلاصه مقاله:

Introduction: Repetitive strain injuries are one of the most prevalent problems in occupational diseases. Repetition, vibration and bad postures of the extremities are physical risk factors related to work that can cause chronic musculoskeletal disorders. Repetitive work on a computer with low level contraction requires the posture to be maintained for a long time, which can cause muscle fatigue. Muscle fatigue in shoulders and neck is one of the most prevalent problems reported with computer users especially during typing. Surface electromyography (SEMG) signals are used for detecting muscle fatigue as a non-invasive method. Material and Methods: Nine healthy females volunteered for signal recoding during typing. EMG signals were recorded from the trapezius muscle, which is subjected to muscle fatigue during typing. After signal analysis and feature extraction, detecting and predicting muscle fatigue was performed by using the MLP artificial neural network. Results: Recorded signals were analyzed in time and frequency domains for feature extraction. Results of classification showed that the MLP neural network can detect and predict muscle fatigue during typing with $80.79 \% \pm 1.04\%$ accuracy. Conclusion: Intelligent classification and prediction of muscle fatigue can have many applications in human factors engineering (ergonomics), rehabilitation engineering and biofeedback equipment for mitigating the injuries of repetitive works

کلمات کلیدی:

Muscle Fatigue, SEMG, Wavelet Coefficients, MLP Neural Network

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