

Assessing muscles fatigue level during bicycling from EMG signals

Electromyography (EMG) is a technique for recording the electrical potentials (signals) generated by muscles. Fig. 1 presents an example of EMG signals recorded from 8 channels while the subject performed 10 hand movements, each repeated three times, shown in Fig. 2.

Analysis of EMG signals is a very hot topic in many fields, and students will be introduced to novel ideas that will have applications in near-future business opportunities. Examples are automatic prosthesis control, assessment of the severity of stroke, smart computer interfacing, detection of neuromuscular disease, assessment of muscle fatigue and subject's vigilance, analysis of gait patterns, classification of different tremor types etc.

Analysis of EMG signals is considered as one of the most reliable methods to detect and predict localized muscle fatigue. Muscle fatigue manifests itself by increased signal amplitude and decreased signal frequency.

The objective of this project is to develop a technique for analysis of EMG signals aiming to assess muscles fatigue level during bicycling. Wavelet transform, linear and nonlinear prediction, filtering, feature extraction and selection are several keywords related to the project.

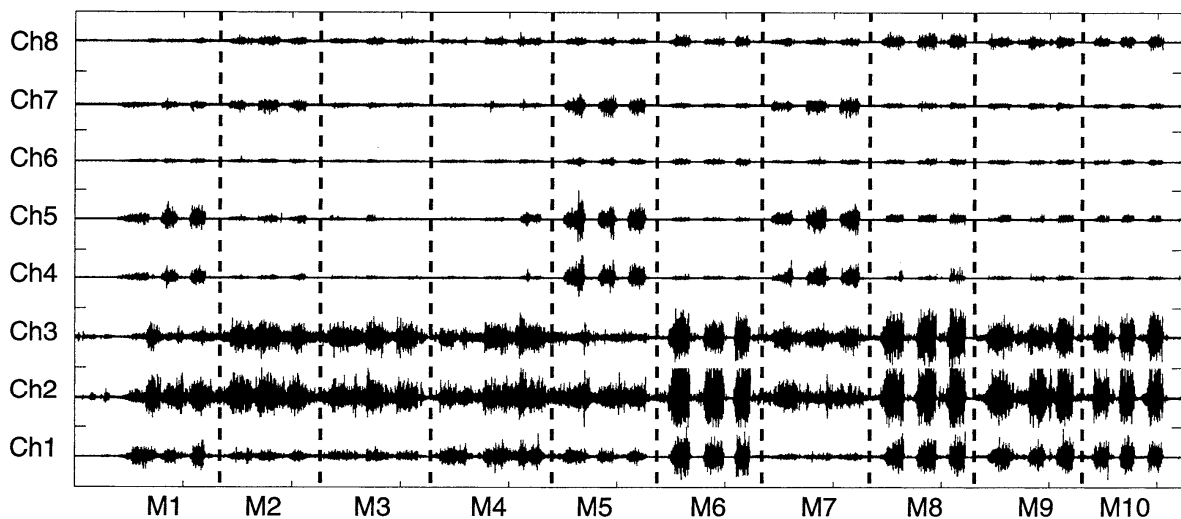


Fig. 1. EMG signals recorded from 8 channels while the patient performed 10 hand movements, each repeated three times, shown in Fig. 2.

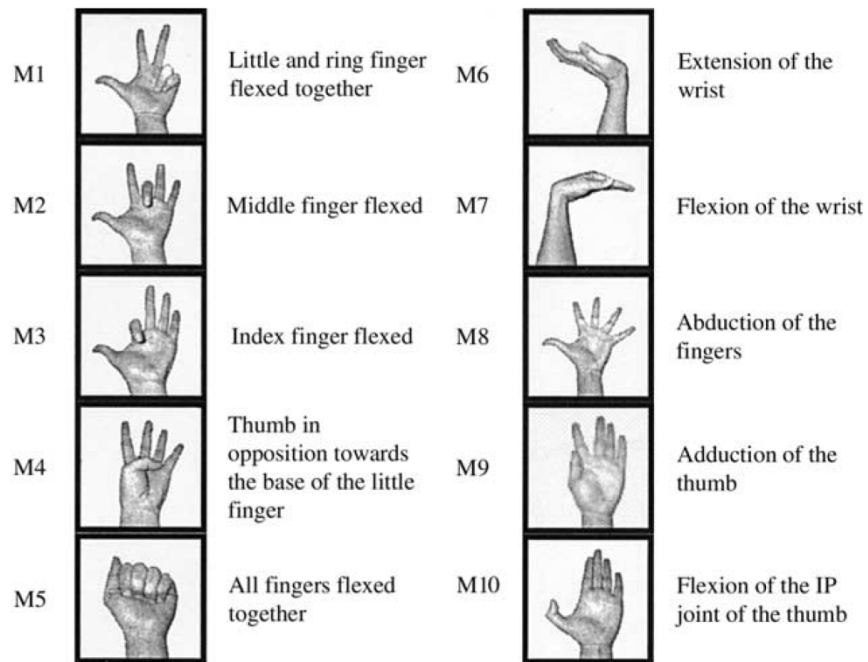


Fig. 2. Hand movements performed during the recording session.

Prerequisites: Course in signal analysis

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