

# Technology offer

## Decomposition of compound muscle action potentials

### Field of use

Systems and cybernetics

### Current state of technology

Stage of Development:  
Available for demonstration

### Patent status

Patent pending

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### Background

The invention performs the decomposition of compound muscle potentials into the contributions of individual motor units or their respective combinations. It also provides an analysis of the basic motor unit characteristics (recruitment threshold, mean triggering frequency, speed of translation of action potentials in muscle wakens, etc.).

### Description of the invention

The invention relates to a method and a device for decomposing compound muscle potentials (CMAPs) in electrically or mechanically elicited muscle contractions. The technical problem that the invention solves is how to estimate the firing patterns of individual motor units out of noninvasively recorded electrical responses of a skeletal muscle to external stimulation and, thus, quantify the motor system responses on the level of neural codes.

CMAP analysis is routinely applied in clinical and neurophysiologic studies to non-invasively assess the functional status of a human motor system *in vivo*, to evaluate motor tract integrity and quantify responses of neuromuscular circuits to training, rehabilitation and degeneration due to various neuromuscular disorders, to study corticospinal excitability, to assess motor nerve conduction properties, fatigue and biomechanical responses in skeletal muscles.

### Main advantages

The invention significantly improves our understanding of motor system responses in these applications.