A multi-fragment approach to identifying significant changes in spike-triggered averages of EMG

Marc H. Schieber, Adam G. Davidson, Ryan Odell and Vanessa Chan. University of Rochester, Rochester, NY 14642

1. Abstract

The spike-triggered average (SpikeTA) is of excellent utility change during different measured tasks. Although SpikeTAs themselves are very popular differences, the variability in SpikeTAs across tasks is not well understood. The multi-fragment approach to comparing SpikeTAs across tasks involves calculating SpikeTAs during each epoch and then comparing the SpikeTAs across epochs. The multi-fragment approach is useful for identifying significant changes in SpikeTAs across tasks and can provide insights into the neural mechanisms underlying these changes.

2. Potential mechanisms for producing various SpikeTA effects

Sidebar: Increment Shifted Average (ISA) adjusts SpikeTA to correct for curvilinear baseline

3. Behavioral Tasks

Squeeze Task

4. Variation in SpikeTAs across behavioral epochs in a single session

5. Multi-fragment Approach

6. Conclusions

1. The SpikeTA effect of a given neuron-muscle pair can change rapidly.

2. Such changes may reflect activation of different networks of neurons in conjunction with the trigger neuron to activate the same muscle during different tasks.

3. Increment Shifted Averages effectively adjust SpikeTAs to correct for curvilinear baseline trends.