UW CENTER FOR
PATTERN ANALYSIS AND MACHINE INTELLIGENCE

GRADUATE SEMINAR SERIES

Muscle Categorization Using PDF Estimation and Naive Bayes Classification

Speaker: Tameem Hesham

Date: October 10, 2012

Time: 4:30 pm - 5 pm

Place: E5 (4128) Refreshments will be served

Abstract :

The structure of motor unit potentials (MUPs) and their times of occurrence provide information about the motor units (MUs) that created them. As such, electromyographic (EMG) data can be used to categorize muscles as normal or suffering from a neuromuscular disease. In this work, characterization techniques that are based on estimating probability density functions (PDFs) for each muscle category are implemented and a novel EMG decomposition technique is presented as well. Even though this technique is not as transparent as pattern discovery (PD), its accuracy is higher than the discrete PD. Ultimately, the goal is to use a technique that is based on both PDFs and PD and make it as transparent and as efficient as possible, but first it was necessary to thoroughly assess how accurate a fully continuous approach can be. Using Gaussian PDF estimation achieved improvements in muscle categorization accuracy over PD and further improvements resulted from using feature value histograms to choose more representative PDFs; for instance, using log-normal distribution to represent skewed histograms.

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