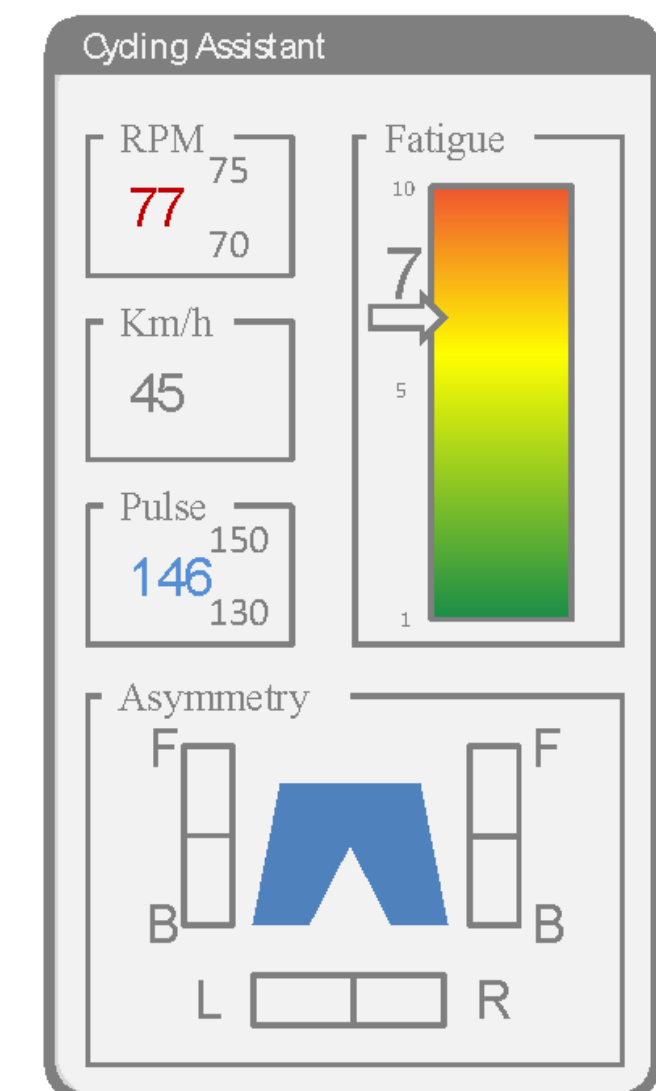
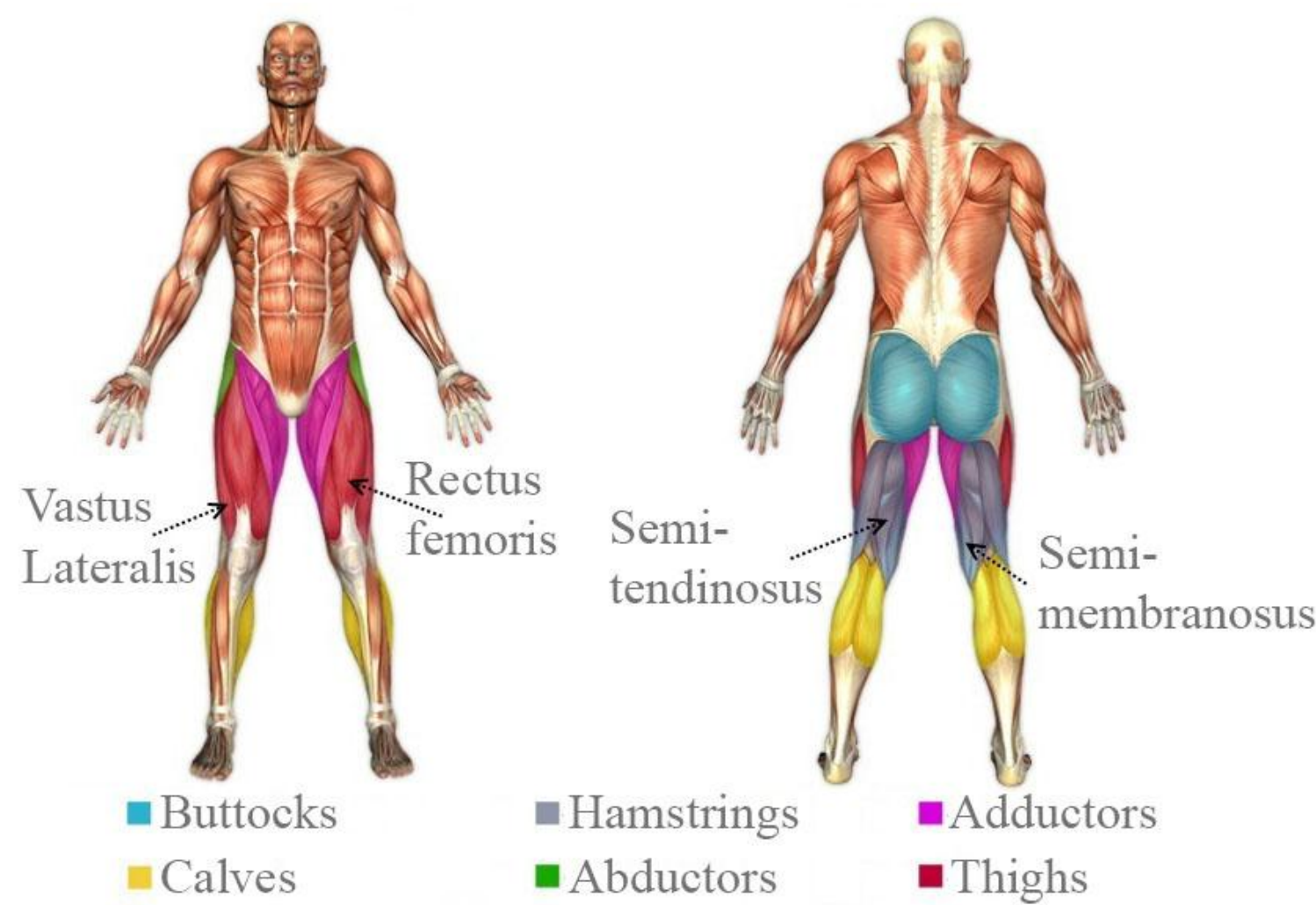


Measuring Muscle Status and Fatigue in Active People

in Cooperation with Free2Move

CAISR Centre for Applied Intelligent Systems Research

Knowledge Foundation

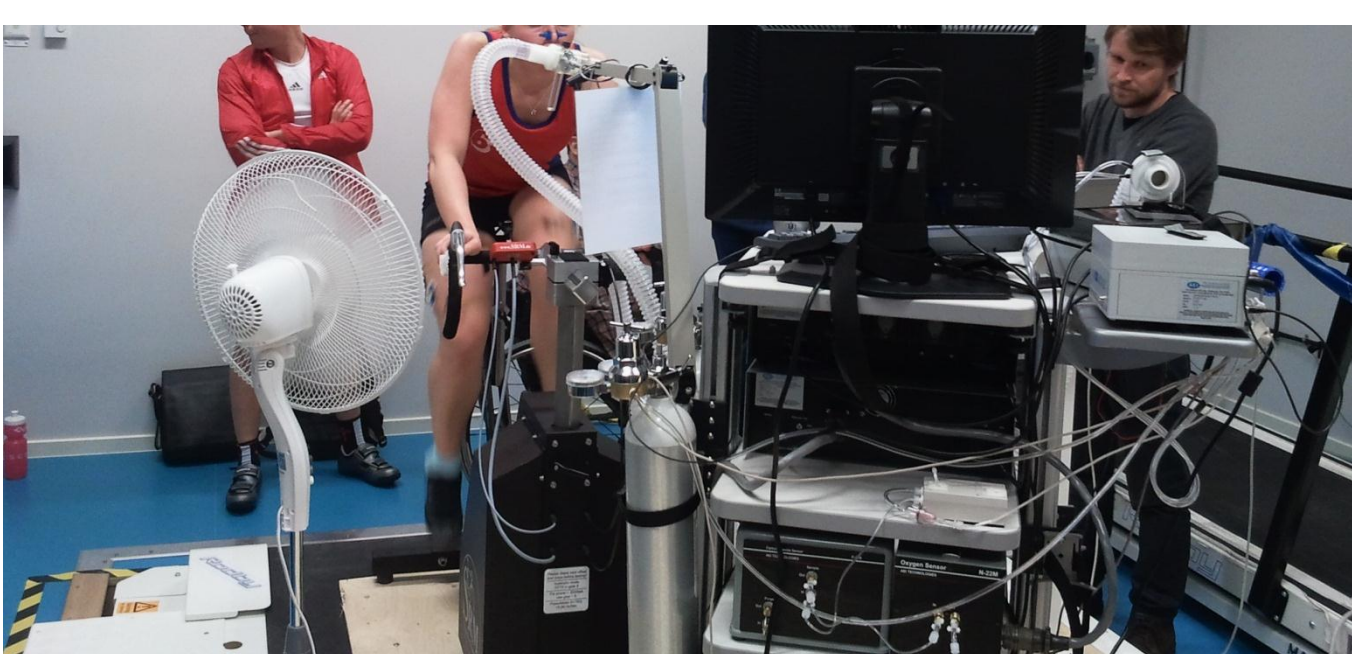


Overall goal

An intelligent wearable device equipped with trainable algorithms capable of assessing localized muscle fatigue, muscle usage/status profile and performing advanced post-training analysis as well.

Background

- High level muscle fatigue can cause serious injuries.
- In case of static muscle work, muscle fatigue manifests itself in increased amplitude and decreased mean/median frequency of EMG signals.
- Diverse results concerning the mean frequency change are obtained in the context of dynamic muscle work.



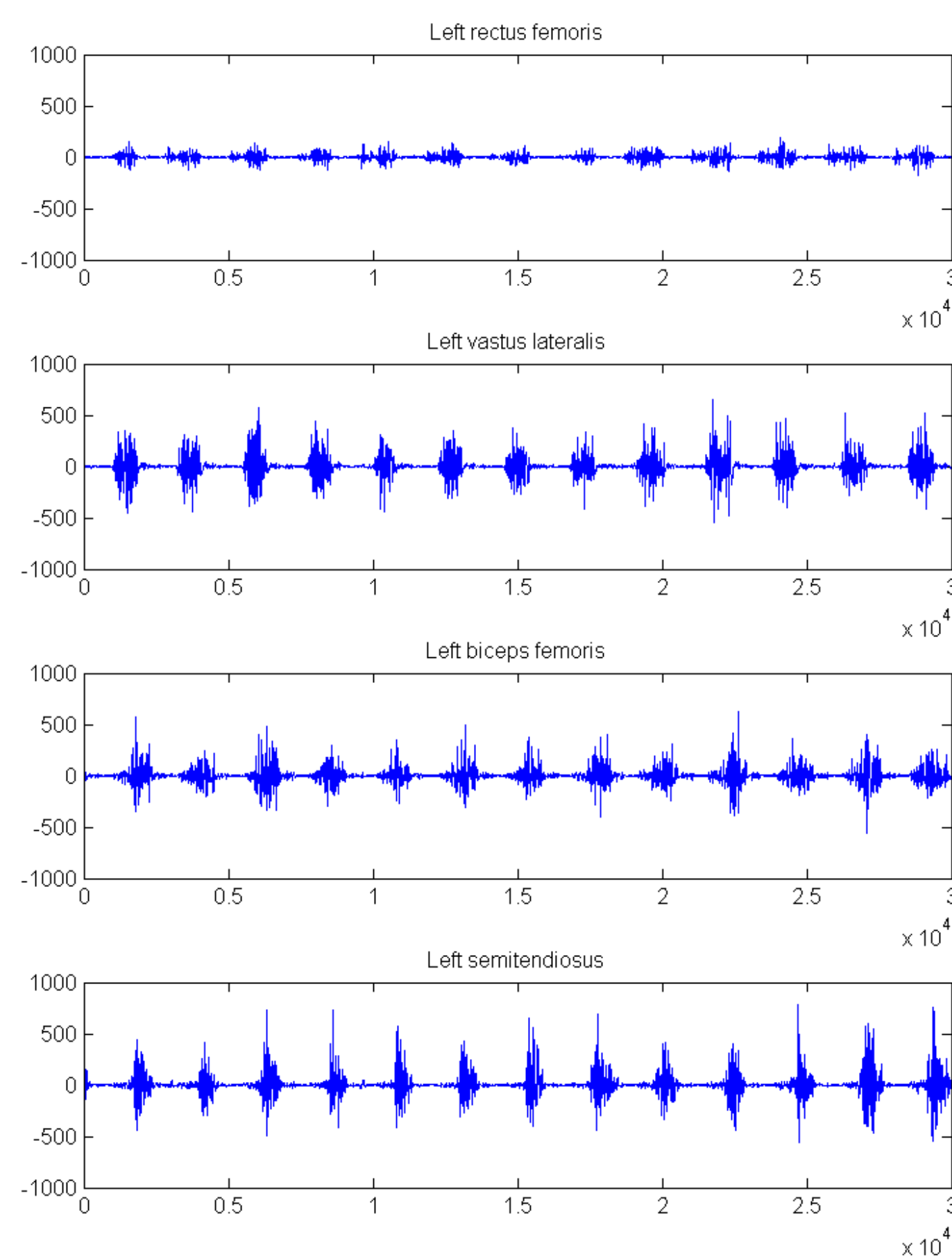
A rigorous data collection experiment.

Planned key activities

- Data collection under controlled and real conditions.
- Algorithms for time-frequency based analysis of EMG signals.
- Exploring relations between the time courses of signals recorded from different muscles.

Situation awareness based on

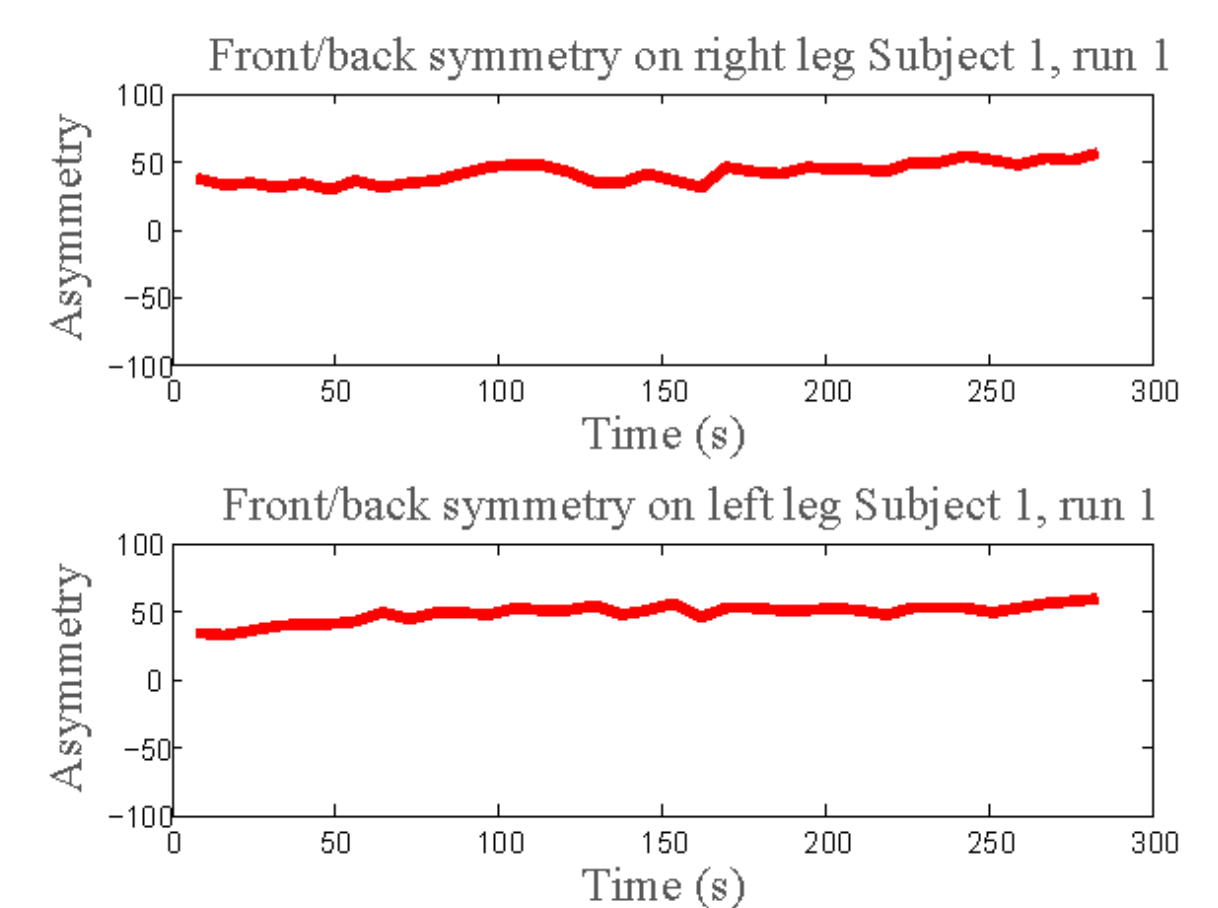
- Methods for fusing data from multiple sensors.
- Models built using information from an uncertain teacher.
- Models able to generalize over subjects and be specific enough.
- Low-cost solutions.



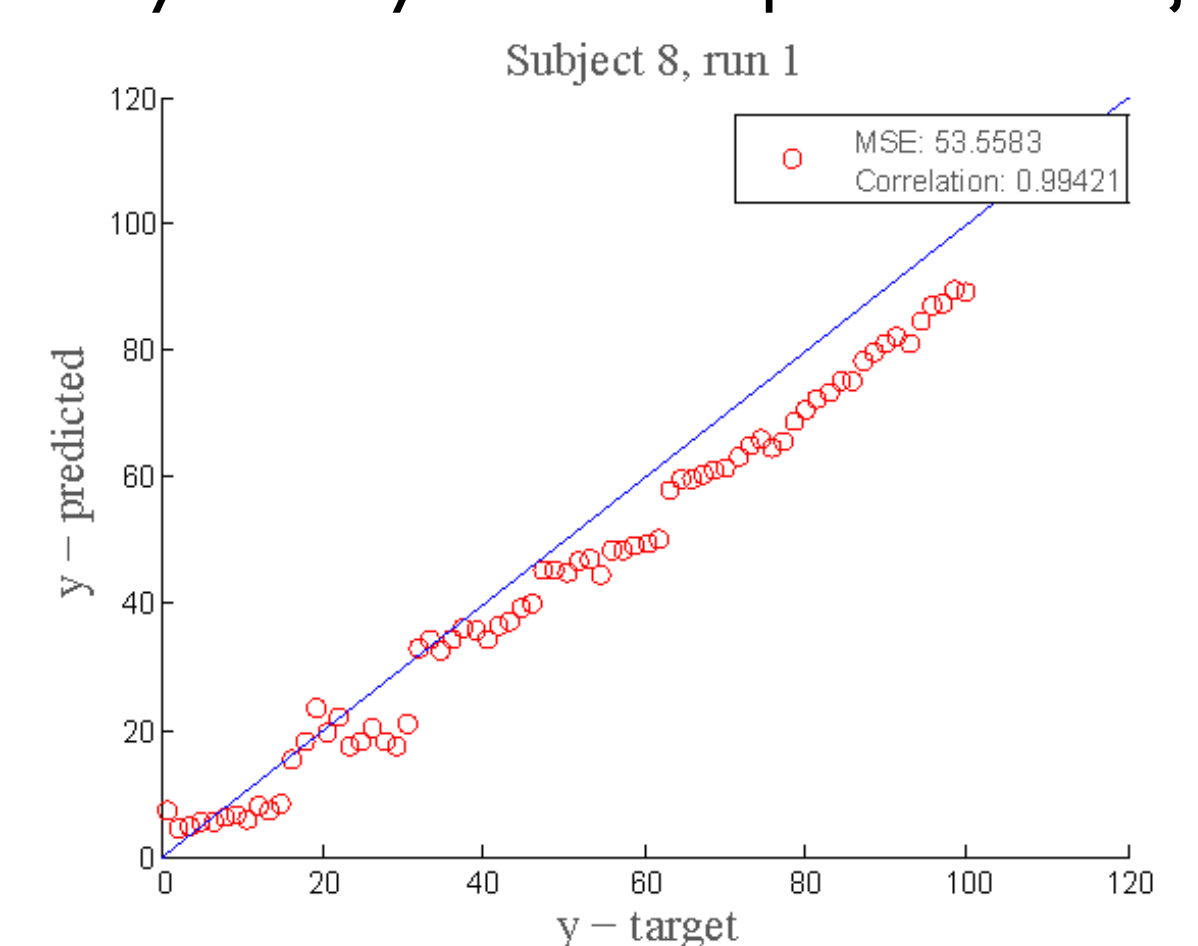
EMG signals recorded from 4 muscles of the left leg during cycling.

The main outcomes so far:

- Two data sets collected under controlled conditions in Halmstad and Gothenburg.
- An algorithm for robust segmentation of EMG signals.
- Preliminary results for the first data set.



Asymmetry index computed for subject 1.



Performance of the fatigue prediction model.