Masterthesis in Sport Science

Title: The influence of different loads, contraction speed and recovery time on muscular fatigue – A physiological and biomechanical analysis of muscle properties

Possible research questions - master thesis: Is there a change in muscle activity, tissue oxygen saturation, infrared radiation and mechanical properties of the muscle for different loads and contractions speeds during repeated simple single-joint movements? How can muscular fatigue be parameterized using easily accessible anthropometric and physiological data?

Background: In cooperation with the Austrian Space Forum and the Institute of Mechatronics we develop a fatigue simulation system (FMSS – Fatigue Monitoring and Simulation System). The Austrian Space Forum is performing Analog Missions in remote areas to improve concepts, methods and technical inventions for future manned Mars-Missions. Extra vehicular activities (EVA), where astronauts have to leave a controlled environment, are considered critical stages in such missions. An accurate monitoring of biomedical parameters is inevitable. A simulation of physiological responses manifesting the level of fatigue during the planned tasks of an EVA would be a highly beneficial planning and organization tool to lower the health risks of astronauts. The simulation system could also be adapted to other working scenarios to estimate the strain of hard physical work on the body.

(c) ÖWF (Florian Voggeneder)

Project goal: Development and validation of an individualized fatigue simulation model for non-standardized movements.
Project start: start data collection in October 2022

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