

Masterthesis in Production Technology

Title: Concept, integration und validation of sensors to quantify support torque and interaction forces of an exoskeleton

Objective and aims - master thesis:

- Developing different concepts to quantify the acute biomechanical effects of a passive exoskeleton
- Implementing an appropriate concept for passive exoskeletons of the AoudaX spacesuit simulator
- Validating the work with reliable objective test measurements

Background: In cooperation with the Austrian Space Forum and the Institute of Sport Science 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. To quantify the biomechanical loads produced by the exoskeletons in the suits is an important step in the early phase of this project.



(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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