

10.11.2022

## Master thesis

Design and manufacturing of a soft ankle exosuit for dorsiflexion assistance  
*Entwurf und Aufbau eines elastischen Sprunggelenk-Exoskeletts zur Unterstützung der Dorsalextension*

Impeded dorsiflexion during the swing phase of the gait cycle is a common difficulty faced by stroke patients. The *Neuromuscular Physiology and Neural Interfacing Lab* seeks to develop an EMG-controlled neuroprosthesis to assist dorsiflexion. To investigate EMG data collection and processing separately, a soft ankle exosuit shall be developed in this master thesis.

The *Institute of Autonomous Systems and Mechatronics* pursues related research goals and will support the organization and supervision of the thesis.

### Task

The goal is to design and build a prototype of a one degree of freedom soft ankle exosuit which can be actuated based on EMG measurements to support the wearer's dorsiflexion (i.e. lifting the ball of the foot). This includes a literature research on the topic, mechanical and mechatronic design as well as the assembly.

The picture shows an existing 3d-printed cable-driven soft exoskeleton for a finger which can be used for inspiration.

### Requirements

- Studies in mechatronics, medical, mechanical, electrical or computational engineering
- Independent working style and high motivation
- Previous knowledge of (elastic) mechanical design, 3d printing and/or biomechanics is an advantage

**Start:** By arrangement

**Supervision & examination:**

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