Teaching a Muscle-Driven Arm Robot to Write

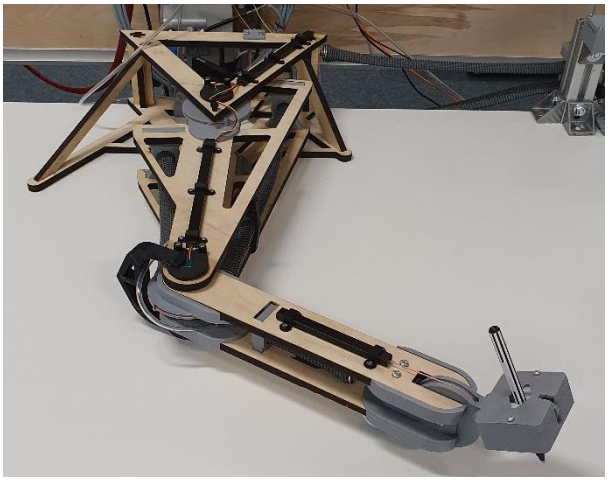
cbb
Computational Biophysics and Biorobotics

Institute for Modelling and Simulation of Biomechanical Systems

Background

Bioinspired robotics is a rapidly advancing field that draws inspiration from biological systems. This approach holds immense potential for innovative developments, including the design of more efficient and adaptable robots.

Our group specializes in the simulation of human biomechanics and the **construction and control of robots actuated by pneumatic artificial muscles (PAMs)**. In a previous project, we have successfully built a PAM actuated robotic arm that can be **controlled using neural-network-based pose tracking**.



Description

The project aims to **investigate whether our arm robot is capable of** dexterous movements, such as **writing letters or drawing simple images**. This should be realized by applying **well-established reinforcement learning techniques**. Specifically, the **reward mechanism of our existing algorithm must be enhanced** to encourage the arm to follow a given trajectory.

Passion for working with software and hardware, as well as the motivation to improve technical skills, are essential for successful participation in this project.

Supervisor:
Syn Schmitt

Advisor:
Sven Schepp

Type:
Master's Thesis,
Research Thesis

Research Area:
Reinforcement learning,
Biomimetics

Skills:
Reinforcement learning,
Programming (Python)

Language:
English, German

Term:
WS 24/25

Please contact us for more information:

E-Mail:
sven-robin.schepp
@imsb.uni-stuttgart.de

Webpage:
https://www.imsb.uni-stuttgart.de