

## Soft Tissue Robotics

Simulation-Driven Concepts and  
Design for Control and  
Automation for Robotic Devices  
Interacting with Soft Tissues

IRTG 2198

### Contacts:

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*S-1/II: Model-based process planning for automated handling of deformable objects (Dr. Lechler, Prof. Allgöwer, Prof. Verl, Prof. P. Xu)*

*S-2/II: Feedback control for dynamic soft tissue systems by a surrogate of the value function (Prof. Haasdonk, Prof. Schmitt, Prof. Besier)*

*S-3/II: Development of Stochastic Model Predictive Control (MPC) formulations for soft tissue robotics (Prof. Allgöwer, Dr. Lechler, A/Prof. McDaid)*

*S-4/II: Sensor information inference in bio-inspired, hierarchical control structures of muscle-driven systems: integration, fusion, learning (Prof. Schmitt, Prof. Allgöwer, Prof. Haasdonk, Dr. Rosset)*

*S-5/II: Electro-mechanical actuator concepts for robotic applications (Prof. Parspour, A/Prof. McDaid)*

*S-6/II: Simulating cognitive resource demands in learning situations on a neural level with computational modelling (Jun.-Prof. Wirzberger, Prof. Billinghamurst, Prof. MacDonald)*

*S-7/II: Tagged-Ultrasound for in vivo characterisation of Skeletal Muscle (Prof. Röhrle, Dr. Ateş, Dr. Handsfield)*

*S-8/II: Skeletal muscle passive and active force estimation in vivo using shear wave elastography (Dr. Ateş, Prof. Röhrle, Prof. Besier)*

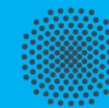
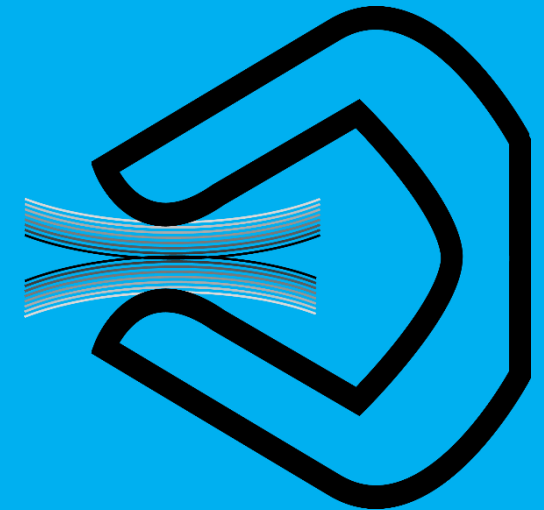
*S-9/II: A Multi-Code Coupling Approach for Muscle Simulation, HPC Perspectives (Prof. Mehl, Prof. Röhrle, Dr. Handsfield, Prof. Besier)*

*S-10/II: Learning to simulate complex soft tissue models fast (Prof. Verl, Prof. Cheng, Prof. Röhrle)*

*S-11/II: Quantum sensor-enabled actuation (Prof. Wrachtrup, Dr. V. Vorobiev, Prof. Röhrle, Prof. Cheng)*

*S-12/II: An Interdisciplinary Approach to Advance Magnetomyography Techniques for Magnetic Field Recordings of Skeletal Muscles (Prof. Röhrle, Prof. Wrachtrup, Prof. Cheng)*

# Soft Tissue Robotics IRTG 2022 Summer School Demonstrator Project Workshop



University of Stuttgart  
Germany

Stuttgart  
August 24, 2022

**International Research  
Training Group (IRTG)  
– DFG Project –  
Soft Tissue Robotics**

**IRTG 2022  
SUMMER SCHOOL**

**Demonstrator  
Project Workshop**

**August 24, 2022**

14:00	<b>Welcome greetings</b> Simona Galliani
14:15	<b>Demonstrator Project Presentation</b> PhD Students' Representatives
14:45	<b>Discussion</b>
15:00	<b>Coffee Break</b>
15:15	<b>Visit to the Neuromechanics Lab (NML)</b>
15:30	<b>Project - Live Demonstration</b> PhD Students' Representatives
16:00	<b>Discussion</b>
16:30	<b>Collaboration Outlook</b>

17:00	<b>Closing Greetings</b> Prof. Oliver Röhrle
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**PLACES:**

- SimTech Seminar Room, PWR-0.009  
Pfaffenwaldring 5a,
- The Neuromechanics Lab (NML), Room  
U.214, Institute for Parallel and Distributed  
Systems, Universitätsstrasse 38,

University of Stuttgart  
70659 Stuttgart  
Germany

Please note that after the "Coffee Break" there will be a change of venue from the SimTech Seminar Room (PWR 0.009), to the Neuromechanics Lab (NML). At the end of the "Project -Live Demonstration" the group will return to PWR 0.009.