Curriculum Vitae

Prof. Oliver Röhrle, Ph.D.

Universität Stuttgart

Institute for Modelling and Simulation of Biomechanical Systems
Chair for Continuum Biomechanics and Mechanobiology

✉ Pfaffenwaldring 5a, 70569 Stuttgart, Germany
@ roehrle@simtech.uni-stuttgart.de
☎ +49 711 / 685 - 66284

Academic Appointments

04/22 - now	**Acting Managing Director**, Institute for Sanitary Engineering, Water Quality and Solid Waste Management, University of Stuttgart.
10/21 - now	**Dean**, Faculty of Civil and Environmental Engineering, University of Stuttgart.
06/20 - now	**Spokesperson** of the DFG Priority Programme 2311 "Robustly coupling continuum-biomechanical in silico models to obtain active biological system models for later use in clinical applications – Co-design of modeling, numerics and usability" and together with Prof. T. Ricken, Dr S. Budday, Prof. A. Klawonn, Prof. R. Bader part of initiators, the programme and steering committee.
06/19 - now	**Founding Director** of the Institute for Modelling and Simulation of Biomechanical Systems and **Chair** for "Continuum Biomechanics and Mechanobiology," at the University of Stuttgart, Germany.
07/19	Offer for the **Directorship of INSIGNEO** at University of Sheffield, UK (declined).
01/19 - now	**Principal Investigator** of the Cluster of Excellence (EXC 2075) for Data-integrated Simulation Science (SimTech).
04/17 - 09/21	**Deputy Dean**, Faculty of Civil and Environmental Engineering, University of Stuttgart, Germany.
03/17 - now	**Spokesperson** of the International Research Training Group on "Soft Tissue Robotics" (GRK 2198) jointly with the University of Auckland, New Zealand.
02/16 - now	**Fellow** of the Stuttgart Center for Simulation Science (SC SimTech), University of Stuttgart, Germany.
07/13 - 05/19	**W3-Professor** for "Continuum Biomechanics and Mechanobiology" at the Stuttgart Research Center for Simulation Technology (SimTech) and at the Institute of Applied Mechanics (CE), Chair II, University of Stuttgart, Germany.
10/11 - now	**Senior Research Expert** and **Attract Fellow** at the Fraunhofer Institute for Manufacturing Engineering and Automation (IPA) in Stuttgart and founder of the "Virtual Orthopedic Lab" at IPA.
05/11	**Positive evaluation as a Junior Professor and Tenure-Track.**
11/08 - 07/13	**Junior Professor** for "Continuum Biomechanics and Mechanobiology" at the Stuttgart Research Center for Simulation Technology (SimTech - Cluster of Excellence) and at the Institute of Applied Mechanics (CE), Chair II, at the University of Stuttgart, Germany.
11/04 - 11/08	**Research Scientist** at the Auckland Bioengineering Institute, University of Auckland, New Zealand.

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · ☎ +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · 🎓 Google Scholar Profile · 🐦 OR71o

Academic Training

07/04 - 10/04	**Postdoctoral Research Associate** at University of Colorado at Boulder (USA).
08/00 - 07/04	**Ph.D. in Applied Mathematics**, University of Colorado at Boulder (USA).

Research Interests: multigrid, finite elements, continuation methods, nonlinear partial differential equations, computational fluid dynamics (CFD).

Ph.D. Thesis: "*Multilevel First-Order System Least Squares for Quasilinear Elliptic Partial Differential Equations*" (defended: June 29, 2004)

Ph.D. supervisors: Prof. Stephen F. McCormick and Prof. Thomas A. Manteuffel

08/98 - 09/99	**M.S. in Mathematics**, University of Wisconsin at Milwaukee (USA).
10/94 - 05/00	**Diplom Wirtschafts-Mathematiker** (Dipl. Math.-oec.)

Universität Ulm, Germany, Faculty of Mathematics and Economical Affairs

Awards and Distinctions

2022 — ERC Advanced Grant 2021

ERC Advanced Grants support excellent and investigator-initiated research projects by leading advanced researchers of any nationality. Applicants may be at any stage of their research career if they have a track-record of significant research achievements of the last 10 years.

2016 — ERC Proof-of-Concept Grant, 2016

The Proof of Concept funding helps ERC grant-holders to bridge the gap between their research and the earliest stage of a marketable innovation.

2012 — ERC Starting Grant, 2012

ERC Starting Grants aim to support up-coming research leaders for up to 5 years to establish or consolidate their own research team. The European Research Council (ERC) is the independent body that funds investigator-driven frontier research in the European Union (EU).

2012 — Capital-magazine Top 40 under 40, 2012

Selected by the German business magazine "Capital" as one of the Top 40 researchers under 40 (see issue 12/2012). Since 2007, Capital determines each year 40 high potentials in 4 categories (business, politics, science, and society).

2012 - now — Honorary Professor at the Auckland Bioengineering Institute, The University of Auckland, New Zealand.

2011 — Fraunhofer ATTRACT Fellow, 2011

The "Fraunhofer Attract" program is Fraunhofer's excellent stipend program. It offers outstanding external scientists the opportunity to develop their ideas and innovations jointly with an optimally equipped Fraunhofer Institute. As Fraunhofer-Attract Fellow, I have been awarded about 1.7 M Euros to build up a "Virtual Orthopedic Lab" within the Fraunhofer Institute for Manufacturing Engineering and Automation IPA in Stuttgart.

2011 — Richard von Mises Prize, 2011 (awarded by the GAMM)

Since 1989, the Richard von Mises Prize is awarded every year by the GAMM to a scientist for exceptional scientific achievements in the field of Applied Mathematics

and Mechanics. The aim of the prize is to reward and encourage young scientists whose research represents a major advancement in the field of Applied Mathematics and Mechanics. The Richard von Mises Prize 2011 was awarded to me *"in appreciation for [my] contributions to scale bridging models in biomechanics with special emphasis on skeletal muscles"*. The GAMM is one of the largest scientific society in the field of applied mathematics and mechanics in Europe.

External Research Funds

13.33 Mio €
Total amount of awarded research grants

Coordinator/ Spokesperson of **5** multi-institutional research grants

3 ERC grants
Advanced Grant, Starting Grant and Proof-of-Concept

2021   Simulation-enhanced High-density Magnetomyographic Quantum Sensor Systems for Decoding Neuromuscular Control During Motion (qMOTION)

Funded by: ERC (European Research Council), Horizon Programme under Grant Number ERC-ADG-2021-101055186 as part of the Calls for ERC Advanded Grants

Amount: $3,500,000 \,€$ for 5 years

Role: Principal Investigator

2021   Soft Tissue Robotics – Simulation-Driven Concepts and Design for Control and Automation for Robotic Devices Interacting with Soft Tissues (GRK 2198)

Funded by: DFG (German Research Council) under Grant Number GRK 2198/3 as part of the International Research Training Group

Amount: $1,348,210 \,€$ for 18 months (from 01.09.2021 to 28.02.2023)

Role: Spokesperson and Principal Investigator

2021   Experimental and in-silico neuromechanics for better rehabilitation and healthy ageing

Funded by: DAAD (German Academic Exchange Service) as part of the Hochschuldialog mit Südeuropa 2022

Amount: $30,000 \,€$ for 2 years (from 01.01.2022 to 31.12.2023)

Role: Co-Principal Investigator (Principal Investigator: L. Gizzi)

2021   Interface-Driven Multi-Field Processes in Porous Media – Flow, Transport and Deformation (SFB 1313)

Funded by: DFG (German Research Council) under Grant Number SFB 1313/2 as part of the Collaborative Research Centre

Amount: $9,500,000 \,€$ for 4 years (from 01.01.2022 to 31.12.2025)

Role: Principal Investigator

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📱 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · 🎓 Google Scholar Profile · 🐦 OR71o

2020   **Central Coordination Project** (SPP 2311)

Funded by: DFG (German Research Council) under Grant Number RO 4019/8-1
Amount: $478,828\,€$ for 3 years (from 01.10.2021 to 30.09.2024)
Role: Coordinator and Principal Investigator

2020   **Skeletal Muscle Adaptation: the cornerstone for modelling neuromuscular diseases and predicting muscular deficiencies (Identification, Homogenisation, Verification, and Integration)** (SPP 2311)

Funded by: DFG (German Research Council) under Grant Number RO 4019/5-1
Amount: $530,288\,€$ for 3 years (from 01.10.2021 to 30.09.2024)
Role: Principal Investigator

2020   **A data-driven optimization framework for improving the adaptation of the neuromuscular system in brain pathology** (SPP 2311)

Funded by: DFG (German Research Council) under Grant Number RO 4019/7-1
Amount: $465,684\,€$ for 3 years (from 01.10.2021 to 30.09.2024)
Role: Principal Investigator

2021   **Muskelverspannungen messen?**

Funded by: Ministerium für Wissenschaft, Forschung und Kunst Baden-Württemberg" under Grant Number AZ 7545.220/42/1 as part of the Förderung von Forschungs- und Entwicklungsprojekten an Hochschulen für angewandte Wissenschaften – Innovative Projekte/Kooperationsprojekte "IP 2020""
Amount: $30,010\,€$ for 2 years (from 01.05.2021 to 30.04.2023)
Role: Co-Principal Investigator (Principal Investigator: L. Gizzi)

2020   **Data-integrated, 3D Muscle Modelling for Optimised Orthopaedic Surgery of the Foot – Prädiktive kontinuumsmechanische Simulationen Muskuloskelettaler Systeme** (3DFoot)

Funded by: BMBF (Federal Ministry of Education and Research) under Grant Number 01EC1907B as part of the "Muskuloskelettale Erkrankungen" Call
Amount: $1,967,555\,€$ for 3 years (from 01.05.2020 onwards)
Role: Principal Investigator

2019   **Eurobench Benchmark** ("Sit-to-Stand")

Funded by: Horizon 2020 under Grant Number H2020-779963 EUROBENCH as part of the Call for subprojects within "eurobench"
Amount: $197,620\,€$ for 18 months
Role: Principal Investigator (together with Dr. Leonardo Gizzi)

2020   **Robuste Kopplung kontinuumsbiomechanischer in silico Modelle für aktive biologische Systeme als Vorstufe klinischer Applikationen** (SPP 2311)

Funded by: DFG (German Research Council) under Grant Number SPP 2311 as part of the Priority Programme
Amount: $6,275,000\,€$ for 3 years
Role: Spokesperson and co-initiator with T. Ricken (Stuttgart, Co-Spokesperson), S. Budday (Erlangen), A. Klawonn (Köln), R. Bader (Rostock)

✉ roehrle@simtech.uni-stuttgart.de · ⊕ http://www.imsb.uni-stuttgart.de · ☏ +49 711 685 66284
ⓘD orcid.org/0000-0002-1934-6525 · ⑧ Google Scholar Profile · 🐦 OR71o

2020   **How do mechanics, neural drive and muscle architecture interact in muscles?**

Funded by: ARC (Australian Research Council) Discovery Project
Amount: Inkind contributions for 4 years
Role: Partner Investigator (Chief Investigators: Lynne Bilston and Robert Herbert)

2019   **University of Stuttgart - University of Excellence**

Funded by: DFG (German Research Council) as part of the University of Excellence
Amount: $95,000,000 \,€$ for 7 years
Role: One of 10 Lead Principal Investigators

2019   **Cluster of Excellence for Data-integrated Simulation Sciences** (EXC 2075)

Funded by: DFG (German Research Council) under Grant Number EXC 2075 as part of
            the Excellence Strategy
Amount: – for 7 years (from 01.01.2019 to 31.12.2025)
Role: Principal Investigator and Project Network Leader

2018   **Interface-Driven Multi-Field Processes in Porous Media – Flow, Transport and Deformation** (SFB 1313)

Funded by: DFG (German Research Council) under Grant Number SFB 1313/1 as part
            of the Collaborative Research Centre
Amount: $355,000 \,€$ for 4 years (from 01.01.2018 to 31.12.2021)
Role: Principal Investigator

2017   **Soft Tissue Robotics – Simulation-Driven Concepts and Design for Control and Automation for Robotic Devices Interacting with Soft Tissues** (GRK 2198)

Funded by: DFG (German Research Council) under Grant Number GRK 2198/1 as part
            of the International Research Training Group
Amount: $5,500,000 \,€$ for 4.5 years (from 01.03.2017 to 31.08.2021)
Role: Spokesperson and Principal Investigator

2017   **Entwicklung eines kontext-sensitiven neural-gesteuerten Hand-Exoskeletts zur Wiederherstellung der Alltagsfähigkeit und Autonomie nach Hirn- und R/"uckenmarkverletzungen** (KONSENS-NHE)

Funded by: Baden-Württemberg Stiftung as part of the Call "Neurorobotik"
Amount: $613,246 \,€$ for 3 years (from 01.04.2017 to 31.03.2020)
Role: Principal Investigator

2017   **WiHDE – A Wireless, Modular, Flexible, High-Density EMG Recording System**

Funded by: ERC (European Research Council) under Grant Number ERC-2016-PoC,
            737545 as part of the Call for Proof-of-Concept (ERC-PoC) proposals
Amount: $150,000 \,€$ for 18 months (from 01.03.2017 to 31.08.2018)
Role: Principal Investigator

2016   **System Mensch**

Funded by: Ministerium für Wissenschaft, Forschung und Kunst Baden-Württemberg as
            part of the Regionale Forschungsallianzen Baden-Württemberg
Amount: Junior Research Group for 5 years (from 01.12.2016 to 30.11.2021)
Role: Principal Investigator

2016   **Towards a digital human: Providing new possibilities to improve the understanding of the neuromus-cular system by switching from small-sized cluster model problems to realistic simulations on HPC clusters** (DiHu)

Funded by: Baden-Württemberg Stiftung under Grant Number "DiHu" as part of the High Performance Computing II Call

Amount: $1,200,000 \in$ for 3 years (from 01.10.2016 to 30.09.2019)

Role: Coordinator and Principal Investigator

2015   **Feuerwehrtaugliche Wärmebildkamera mit erweiterter Realität durch Radarsensorik** (FeuerWeRR)

Funded by: BMBF (Federal Ministry of Education and Research) under Grant Number 13N13479 as part of the Call for Zivile Sicherheit

Amount: $1,900,000 \in$ for 3 years (from 01.03.2015 to 31.05.2018)

Role: Coordinator and Principal Investigator

2015   **Ergo-dynamic Moving MAnikin with Cognitive Control** (EMMA-CC)

Funded by: Fraunhofer internal MAVO Program

Amount: $3,400,000 \in$ for 3 years (from 01.01.2015 to 31.05.2018)

Role: Principal Investigator

2014   **Biological Design and Integrative Structures** (SFB-TRR 141)

Funded by: DFG (German Research Council) under Grant Number SFB-TRR 141/1

Amount: $380,000 \in$ for 4.5 years (from 01.11.2014 to 30.05.2019)

Role: Principal Investigator for A03 and A09

2012   **Lower Extremity Amputee Dynamics (LEAD): Simulating the Motion of an Above-Knee Amputee's Stumpby Means of a Novel, EMG-Integrated, 3D Musculoskeletal, Forward-Dynamics Modelling Approach**

Funded by: ERC (European Research Council), FP7 Programme under Grant Number ERC-2012-StG, 306757 as part of the Calls for ERC Starting Grants

Amount: $1,670,000 \in$ for 5 years (from 01.11.2012 to 31.10.2018)

Role: Principal Investigator

2011   **Virtual Orthopedic Lab - Simulationsumgebung für Orthopädieforschung und -entwicklung**

Funded by: Fraunhofer Society under Grant Number "Virtual Orthopedic Lab" as part of the Attract-Programme

Amount: $1,720,000 \in$ for 6.5 years (from 01.11.2011 to 30.04.2018)

Role: Attract Group Leader

2009   **Using 1D-3D coupled skeletal muscle models to realistically simulate the influence of skeletal muscles forceson lumbar spine mechanics** (EXC 310)

Funded by: DFG (German Research Council) under Grant Number EXC 310 as part of the Cluster of Excellence

Amount: $\approx 350,000 \in$ for 5 years (from 01.05.2009 to 30.04.2014)

Role: Principal Investigator

2008   **Functional Electrical Stimulation** (GIPI)

Funded by: The Tertiary Education Commission (TEC) of New Zealand under Grant Number Knowledge Transfer Fund as part of the Knowledge Transfer

Amount: $20,000$ NZD for 0.5 years (from 01.07.2008 to 31.12.2008)
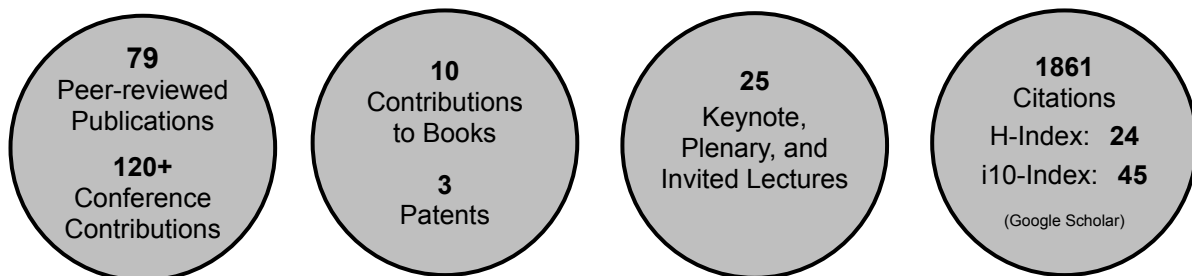
Role: Co-Investigator

2006   **Towards three-dimensional models of active contraction of skeletal muscles** (ISAT)

Funded by: Royal Society of New Zealand under Grant Number ISATB05-54 as part of the ISAT Linkage Fund Funding Initiative

Amount: 5500 NZD for 0.5 years (from 01.01.2006 to 30.06.2006)

Role: Principal Investigator

Publications in Peer-reviewed International Journals

79
Peer-reviewed
Publications

120+
Conference
Contributions

10
Contributions
to Books

3
Patents

25
Keynote,
Plenary, and
Invited Lectures

1861
Citations
H-Index: **24**
i10-Index: **45**

(Google Scholar)

(retrieved on April 26, 2022)

Submitted Articles Under Review

[1]   Bleiler, C., **Röhrle, O.,** "Statistical-based Modelling of Fibre Networks: Strain Measures and Energies for Crimped Fibres and Novel Analytical Expressions for Fibre Populations", submitted in Jan. 2022 to Journal of Elasticity (IF: 2.085).

[2]   Ali, H., Umander, J., Rohlen, R., **Röhrle, O.**, Grönlund, C., "Generation of Authentic Image Sequences of Intra-muscular Contraction Dynamics Using In-silico to In-vivo Domain Translation", submitted in 2021 to IEEE Transactions on Biomedical Engineering (IF: 4.538).

[3]   Becher, M., Rau, T., Gralka, P., Kelleter, C., Blandini, L., Sobek, W., Klotz, T., **Röhrle, O.**, Maier, B., Schulte, M., Reina, G., Krone, M., Ertl, T., "Probe Glyphs: Occlusion-free Visualization for Dense 3D Data", submitted in 2021 to IEEE Pacific Visualization Symposium! PacificVis 2022, Vol. 10 pages,

[4]   Maier, B., Göddeke, D., Huber, F., Klotz, T., **Röhrle, O.**, Schulte, M., "OpenDiHu—Efficient and Scalable Software for Biophysical Simulations of the Neuromuscular System", submitted in Sept. 2021 to Journal of Computational Physics (IF: 3.553).

Peer-reviewed Journal Articles Published in 2022: 5 Publications

[1]   Bleiler, C., **Röhrle, O.,** "Statistical-based Modelling of Fibre Networks: Strain Measures and Energies for Crimped Fibres and Novel Analytical Expressions for Fibre Populations", submitted in Jan. 2022 to Journal of Elasticity (IF: 2.085).

[5] Hessenthaler, A., Falgout, R. D., Schroder, J. B., de Vecchi, A., Nordsletten, D., **Röhrle, O.,** "Time-periodic Steady-state Solution of Fluid-structure Interaction and Cardiac Flow Problems Through Multigrid-reduction-in-time", Computer Methods in Applied Mechanics and Engineering, Vol. 389, p 114368, 2022 (IF: 5.763, doi: `https://doi.org/10.1016/j.cma.2021.114368`).

[6] Kässinger, J., Rosin, D., Dürr, F., Hornischer, N., **Röhrle, O.**, Rothermel, K., "Persival: Simulating Complex 3D Meshes on Resource-Constrained Mobile AR Devices Using Interpolation", IEEE International Conference on Distributed Computing Systems (ICDCS 2022), 2022 (IF: CORE 2021 A).

[7] Klotz, T., Gizzi, L., **Röhrle, O.,** "Investigating the Spatial Resolution of EMG and MMG Based on a Systemic Multi-scale Model", Biomechanics and Modelling in Mechanobiology, 2022 (IF: 2.963, doi: `arXiv:2108.05046`).

[8] Ramakrishnan, A., **Röhrle, O.**, Ludtka, C., Varghese, R., Kiesow, A., Koehler, J., Schwan, S., "Numerical Study of the Stress State on the Oral Mucosa and Abutment Tooth Upon Insertion of Partial Dentures in the Mandible", International Journal for Numerical Methods in Biomedical Engineering, 2022 (IF: 2.747).

Peer-reviewed Journal Articles Published in 2021: 10 Publications

[3] Becher, M., Rau, T., Gralka, P., Kelleter, C., Blandini, L., Sobek, W., Klotz, T., **Röhrle, O.**, Maier, B., Schulte, M., Reina, G., Krone, M., Ertl, T., "Probe Glyphs: Occlusion-free Visualization for Dense 3D Data", submitted in 2021 to IEEE Pacific Visualization Symposium! PacificVis 2022, Vol. 10 pages,

[9] Bleiler, C., Ponte Castañeda, P., **Röhrle, O.,** "Tangent Second-order Homogenisation Estimates for Incompressible Hyperelastic Composites with Fibrous Microstructures and Anisotropic Phases", Journal of the Mechanics and Physics of Solids, Vol. 147, p 104251, 2021 (IF: 5.000, doi: `10.1016/j.jmps.2020.104251`).

[10] Gizzi, L., Vujaklija, I., Sartori, M., **Röhrle, O.**, Severini, G., "Somatosensory Integration in Human Movement: Perspectives for Neuromechanics, Modelling and Rehabilitation (Editorial)", Frontiers in Bioengineering and Biotechnology, Vol. 9, 2021 (IF: 5.890, doi: `10.3389/fbioe.2021.725603`).

[11] Gizzi, L., Yavuz, U. Ş., Hillerkuss, D., Geri, T., Gneiting, E., Domeier, F., Schmitt, S., **Röhrle, O.,** "Variations in Muscle Activity and Exerted Torque During Temporary Blood Flow Restriction in Healthy Individuals", Frontiers in Bioengineering and Biotechnology, Vol. 9, p 100, 2021 (IF: 5.890, doi: `10.3389/fbioe.2021.557761`).

[12] Klotz, T., Bleiler, C., **Röhrle, O.,** "A Physiology-Guided Classification of Active-Stress and Active-Strain Approaches for Continuum-Mechanical Modeling of Skeletal Muscle Tissue", Frontiers in Physiology, Vol. 12, 2021, (doi: `10.3389/fphys.2021.685531`).

[13] Lara, J., Cheng, L. K., **Röhrle, O.**, Paskaranandavadivel, N., "Design and Application of a High-density Electromyography Electrode Array to Assess Intrinsic Hand Muscle Activation (Featured Article in 5/22 Issue)", IEEE Transaction of Biomedical Engineering, 2021 (IF: 4.538).

[14] Ramakrishnan, A., **Röhrle, O.**, Ludtka, C., Varghese, R., Köhler, J., Kiesow, A., Schwan, S., "Finite Element Evaluation of the Effect of Adhesive Creams on the Stress State of Dentures and Oral Mucosa", Applied Bionics and Biomechanics, p 1–9, 2021 (IF: 1.141, doi: `10.1155/2021/5533770`).

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📱 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · Ⓖ Google Scholar Profile · 🐦 OR71o

[15] Shuva, S., Buchfink, P., **Röhrle, O.**, Haasdonk, B., "Reduced Basis Methods for Efficient Simulation of a Rigid Robot Hand Interacting with Soft Tissue", Large-Scale Scientific Computing (Editor: Lirkov, Margenov), Vol. (accepted), 2021.

[16] Woodford, S. C., Robinson, D. L., Edelmann, C., Mehl, A., **Röhrle, O.**, Lee, P. V. S., Ackland, D. C., "Low-Profile Electromagnetic Field Sensors in the Measurement and Modelling of Three-Dimensional Jaw Kinematics and Occlusal Loading", Annals of Biomedical Engineering, 2021 (IF: 3.324, doi: `10.1007/s10439-020-02688-6`).

[17] Zhang, C., Shagieva, F., Widmann, M., Kuebler, M., Vorobyov, V., Kapitanova, P., Nenasheva, E., Corkill, R., **Röhrle, O.**, Nakamura, K., Sumiya, H., Onoda, S., Isoya, J., Wrachtrup, J., "Diamond Magnetometry and Gradiometry Towards Subpicotesla Dc Field Measurement", Physical Review Applied, Vol. 15 (6), 2021 (IF: 4.985, doi: `10.1103/physrevapplied.15.064075`).

Peer-reviewed Journal Articles Published in 2020: 9 Publications

[18] Altan, E., Seide, S., Bayram, I., Gizzi, L., Ertan, H., **Röhrle, O.,** "A Systematic Review and Meta-Analysis on the Longitudinal Effects of Unilateral Knee Extension Exercise on Muscle Strength", Frontiers in Sports and Active Living, Vol. 2, p 169, 2020, (doi: `10.3389/fspor.2020.518148`).

[19] Asgharzadeh, P., Birkhold, A., Trivedi, Z., Özdemir, B., Reski, R., **Röhrle, O.,** "A NanoFE Simulation-based Surrogate Machine Learning Model to Predict Mechanical Functionality of Protein Networks From Live Confocal Imaging", Computational and Structural Biotechnology Journal, accepted, 2020 (IF: 6.018, doi: `10.1101/2020.03.27.011239`).

[20] Asgharzadeh, P., **Röhrle, O.**, Willie, B. M., Birkhold, A. I., "Decoding Rejuvenating Effects of Mechanical Loading on Skeletal Aging Using in Vivo MicroCT Imaging and Deep Learning", Acta Biomaterialia, Vol. 106, p 193–207, 2020 (IF: 6.319, doi: `10.1016/j.actbio.2020.02.007`).

[21] Emamy, N., Litty, P., Klotz, T., Mehl, M., **Röhrle, O.,** "POD-DEIM Model Order Reduction for the Monodomain Reaction-Diffusion Sub-Model of the Neuro-Muscular System", Vol. 19, p 177–190, 2020, (doi: `10.1007/978-3-030-21013-7_13`).

[22] Hessenthaler, A., Balmus, M., **Röhrle, O.**, Nordsletten, D., "A Class of Analytic Solutions for Verification and Convergence Analysis of Linear and Nonlinear Fluid-Structure Interaction Algorithms", Computer Methods in Applied Mechanics and Engineering, 2020 (IF: 4.821, doi: `10.1016/j.cma.2020.112841`).

[23] Hessenthaler, A., Southworth, B., Nordsletten, D., **Röhrle, O.**, Falgout, R., Schroder, J., "Multilevel Convergence Analysis of Multigrid-reduction-in-time", SIAM Journal on Scientific Computing, Vol. 42 (2), p 771–796, 2020 (IF: 2.310, doi: `10.1137/19m1238812`).

[24] Klotz, T., Gizzi, L., Yavuz, U., **Röhrle, O.,** "Modelling the Electrical Activity of Skeletal Muscle Tissue Using a Multi-domain Approach", Journal of Biomechanics and Modeling in Mechanobiology, Vol. 10 (1270), p 1–15, 2020 (IF: 3.323, doi: `10.1007/s10237-019-01214-5`).

[25] Saini, H., Ackland, D. C., Gong, L., Cheng, **Röhrle, O.,** "Occlusal Load Modelling Significantly Impacts the Predicted Tooth Stress Response During Biting: a Simulation Study", Computer Methods in Biomechanics and Biomedical Engineering, Vol. 23 (7), p 261–270, 2020 (IF: 1.610, doi: `10.1080/10255842.2020.1711886`).

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📱 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · 🎓 Google Scholar Profile · 🐦 OR71o

[26] Walter, J. R., Saini, H., Maier, B., Mostashiri, N., Aguayo, J. L., Zarshenas, H., Hinze, C., Shuva, S., Köhler, J., Sahrmann, A. S., Chang, C. .-., Csiszar, A., Galliani, S., Cheng, L. K., **Röhrle, O.,** "Comparative Study of a Biomechanical Model-based and Black-box Approach for Subject-Specific Movement Prediction*", p 4775–4778, 2020, (doi: `10. 1109/EMBC44109.2020.9176600`).

Peer-reviewed Journal Articles Published in 2019: 4 Publications

[27] Bleiler, C., Castañeda, P. P., **Röhrle, O.,** "A Microstructurally-based, Multi-scale, Continuum-mechanical Model for the Passive Behaviour of Skeletal Muscle Tissue", Journal of the Mechanical Behavior of Biomedical Materials, Vol. 97, p 171–186, 2019 (IF: 3.485, doi: `10.1016/j.jmbbm.2019.05.012`).

[28] **Röhrle, O.**, Yavuz, U., Klotz, T., Negro, F., Heidlauf, T., "Multiscale Modeling of the Neuromuscular System: Coupling Neurophysiology and Skeletal Muscle Mechanics", WIREs Systems Biology & Medicine, Vol. 11 (e1457), p 1–43, 2019 (IF: 3.709, doi: `10. 1002/wsbm.1457`).

[29] Schmid, L., Klotz, T., Siebert, T., **Röhrle, O.,** "Characterization of Electromechanical Delay Based on a Biophysical Multi-scale Skeletal Muscle Model", Frontiers in Physiology, Vol. 10 (1270), p 1–13, 2019 (IF: 3.201, doi: `10.3389/fphys.2019.01270`).

[30] Tomalka, A., **Röhrle, O.**, Pham, T., Han, J., Taberner, A., Siebert, T., "Extensive Eccentric Contractions in Intact Cardiac Trabeculae – Revealing Compelling Differences in Contractile Behaviour Compared to Skeletal Muscles", Journal of the Mechanical Behavior of Biomedical Materials, Vol. 286 (20190719), p 171–186, 2019 (IF: 4.847, doi: `10.1098/ rspb.2019.0719`).

Peer-reviewed Journal Articles Published in 2018: 10 Publications

[31] Asgharzadeh, P., Özdemir, B., Reski, R., **Röhrle, O.**, Birkhold, A., "Computational 3D Imaging to Quantify Structural Components and Assembly of Protein Networks", Acta Biomaterialia, Vol. 69 (15), p 206–217, 2018 (IF: 6.638, doi: `10.1016/j.actbio.2018. 01.020`).

[32] Bradley, C., Emamy, N., Ertl, T., Göddeke, D., Hessenthaler, A., Klotz, T., Krämer, A., Krone, M., Maier, B., Mehl, M., Rau, T., **Röhrle, O.,** "Enabling Detailed, Biophysics-based Skeletal Muscle Models on HPC Systems", Frontiers in Physiology, Vol. 9 (816), p 1–25, 2018 (IF: 3.201, doi: `10.3389/fphys.2018.00816`).

[33] Eggs, B., Birkhold, A. I., **Röhrle, O.**, Betz, O., "Structure and Function of the Musculoskeletal Ovipositor System of an Ichneumonid Wasp", BMC Zoology, Vol. 3 (1), 2018, (doi: `10.1186/s40850-018-0037-2`).

[34] Gizzi, L., **Röhrle, O.**, Petzke, F., Falla, D., "People with Low Back Pain Show Reduced Movement Complexity During Their Most Active Daily Tasks", European Journal of Pain, Vol. 23 (2), p 410–418, 2018 (IF: 3.188, doi: `10.1002/ejp.1318`).

[35] Hessenthaler, A., Nordsletten, D., **Röhrle, O.**, Schroder, J., Falgout, R., "Convergence of the Multigrid-reduction-in-time Algorithm for the Linear Elasticity Equations", Numerical Linear Algebra with Applications, Vol. 25 (3), 18 pages, 2018 (IF: 1.298, doi: `10.1002/ nla.2155`).

[36] Özdemir, B., Asgharzadeh, P., Birkhold, A., Mueller, S., **Röhrle, O.**, Reski, R., "Cytological Analysis and Structural Quantification of FtsZ1-2 and FtsZ2-1 Network Characteristics in Physcomitrella Patens", Scientific Reports 8, Vol. 23 (2), p 410–418, 2018 (IF: 4.122, doi: `10.1038/s41598-018-29284-y`).

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📱 +49 711 685 66284
🔴 orcid.org/0000-0002-1934-6525 · 🟦 Google Scholar Profile · 🐦 OR71o

[37] Ramasamy, E., Avci, O., Dorow, B., Chong, S.-Y., Gizzi, L., Steidle, G., Schick, F., **Röhrle, O.,** "An Efficient Modelling-Simulation-Analysis Workflow to Investigate Stump-Socket Interaction Using Patient-Specific, Three-Dimensional, Continuum-Mechanical, Finite Element Residual Limb Models", Frontiers in Bioengineering and Biotechnology, Vol. 3 (12), p 1–25, 2018 (IF: 5.122, doi: 10.3389/fbioe.2018.00126).

[38] **Röhrle, O.**, Saini, H., Ackland, D., "Occlusal Loading During Biting From an Experimental and Simulation Point of View", Journal of Dental Materials, Vol. 34 (1), p 58–68, 2018 (IF: 4.070, doi: 10.1016/j.dental.2017.09.005).

[39] **Röhrle, O.**, Saini, H., Lee, P. V. S., Ackland, D. C., "A Novel Computational Method to Determine Subject-specific Bite Force and Occlusal Loading During Mastication", Computer Methods in Biomechanics and Biomedical Engineering, Vol. 21 (6), p 453–460, 2018 (IF: 1.610, doi: 10.1080/10255842.2018.1479744).

[40] Valentin, J., Sprenger, M., Pflüger, D., **Röhrle, O.,** "Gradient-based Optimization with B-splines on Sparse Grids for Solving Forward-dynamics Simulations of Three-dimensional, Continuum-mechanical Musculoskeletal System Models", International Journal for Numerical Methods in Biomedical Engineering, Vol. 34 (5), e2965, 2018 (IF: 2.082, doi: 10.1002/cnm.2965).

Peer-reviewed Journal Articles Published in 2017: 7 Publications

[41] Heidlauf, T., Klotz, T., Siebert, T., Rode, C., **Röhrle, O.,** "A Continuum-mechanical Skeletal Muscle Model Including Actin-titin Interaction Predicts Stable Contractions on the Descending Limb of the Force-length Relation", Journal of Computational Science, Vol. PLOS Computational Biology 13 (10), p 1298–1405, 2017 (IF: 4.428, doi: 10.1371/journal.pcbi.1005773).

[42] Hessenthaler, A., Gaddum, N. R., Holub, O., Sinkus, R., **Röhrle, O.**, Nordsletten, D., "Experiment for Validation of Fluid-structure Interaction Models and Algorithms", International Journal for Numerical Methods in Biomedical Engineering, Vol. 33 (9), e2848, 2017 (IF: 2.082, doi: 10.1002/cnm.2848).

[43] Hessenthaler, A., **Röhrle, O.**, Nordsletten, D., "Validation of a Non-conforming Monolithic Fluid-structure Interaction Method Using Phase-contrast MRI", International Journal for Numerical Methods in Biomedical Engineering, Vol. 33 (8), e2845, 2017 (IF: 2.776, doi: 10.1002/cnm.2845).

[44] Hoekstra, A., Vosse, F., **Röhrle, O.,** "The Virtual Physiological Human Conference 2016", Journal of Computational Science, Vol. 36 (5), p 1298–1405, 2017 (IF: 2.502, doi: 10.1016/j.jocs.2017.11.014).

[45] Mordhorst, M., Strecker, T., Wirtz, D., Heidlauf, T., **Röhrle, O.,** "POD-DEIM Reduction of Numerical EMG Models", Journal of Computational Science, Vol. PLOS Computational Biology 13 (10), p 86–96, 2017 (IF: 2.502).

[46] Schneider, M., Buschbaum, J., Joeris, A., **Röhrle, O.**, Dwyer, J., Hunter, J. B., Reynolds, R. A., Slongo, T. F., Gueorguiev, B., Varga, P., "Biomechanical Investigation of Two Long Bone Growth Modulation Techniques by Finite Element Simulations", Journal of Orthopaedic Research®, Vol. 36 (5), p 1398–1405, 2017 (IF: 3.043, doi: 10.1002/jor.23762).

[47] Zderic, I., Steinmetz, P., Benneker, L., Sprecher, C., **Röhrle, O.**, Windolf, M., Boger, A., Gueorguiev-Rüegg, B., "Bone Cement Allocation Analysis in Artificial Cancellous Bone Structures", Journal of Orthopaedic Translation, Vol. PLOS Computational Biology 13 (10), p 40–48, 2017 (IF: 3.063, doi: 10.1016/j.jot.2016.09.002).

Peer-reviewed Journal Articles Published in 2016: 5 Publications

[48] Chong, S.-Y., **Röhrle, O.,** "Exploring the Use of Non-image-based Ultrasound to Detect the Position of the Residual Femur Within a Stump", PLoS One, Vol. 11 (10), 22 pages, 2016 (IF: 2.806, doi: `10.1371/journal.pone.0164583`).

[49] Fernandez, J., Zhang, J., Heidlauf, T., Sartori, M., Besier, T., **Röhrle, O.**, Lloyd, D., "Multiscale Musculoskeletal Modelling, Data?model Fusion and Electromyography-informed Modelling", Interface Focus 6, Vol. 11 (10), p 1424–1437, 2016 (IF: 3.092, doi: `10.1098/rsfs.2015.0084`).

[50] Heidlauf, T., Klotz, T., Altan, E., Bleiler, C., Siebert, T., Rode, C., **Röhrle, O.,** "A Multi-scale Continuum Model of Skeletal Muscle Mechanics Predicting Force Enhancement Based on Actin-titin Interaction", Biomechanics and Modeling in Mechanobiology, Vol. 11 (10), p 1424–1437, 2016 (IF: 2.082, doi: `10.1007/s10237-016-0772-7`).

[51] **Röhrle, O.**, Neumann, V., Heidlauf, T., "The Role of Parvalbumin, Sarcoplasmatic Reticulum Calcium Pump Rate, Rates of Cross-Bridge Dynamics, and Ryanodine Receptor Calcium Current on Peripheral Muscle Fatigue: a Simulation Study", Computational and Mathematical Methods in Medicine, Vol. 16 (3), 14 pages, 2016 (IF: 1.563, doi: `10.1155/2016/3180205`).

[52] **Röhrle, O.**, Sprenger, M., Schmitt, S., "A Two-muscle, Continuum-mechanical Forward Simulation of the Upper Limb", Biomechanics and Modeling in Mechanobiology, Vol. 16 (3), p 743–762, 2016 (IF: 2.829, doi: `10.1007/s10237-016-0850-x`).

Peer-reviewed Journal Articles Published in 2015: 3 Publications

[53] Chong, S.-Y., Dorow, B., Ramasamy, E., Dennerlein, F., **Röhrle, O.,** "On The Use Of Collision Detection To Infer Multi-Camera Calibration Quality", Frontiers in Bioengineering and Biotechnology, Vol. 11 (10), p 34–43, 2015 (IF: 5.122, doi: `10.3389/fbioe.2015.00065`).

[54] Kupczik, K., Stark, H., Mundry, R., Neininger, F., Heidlauf, T., **Röhrle, O.,** "Reconstruction of Muscle Fascicle Architecture From Iodine-enhanced MicroCT Images: a Combined Texture Mapping and Streamline Approach", Journal of Theoretical Biology, Vol. 11 (10), p 34–43, 2015 (IF: 1.875, doi: `10.1016/j.jtbi.2015.06.034`).

[55] Mordhorst, M., Strecker, T., Wirtz, D., Heidlauf, T., **Röhrle, O.,** "POD-DEIM Reduction of Computational EMG Models", Journal of Computational Science, Vol. 19, p 86–96, 2015, (doi: `10.1016/j.jocs.2017.01.009`).

Peer-reviewed Journal Articles Published in 2014: 2 Publications

[56] Bleiler, C., Wagner, A., Stadelmann, V., Windolf, M., Köstler, H., Boger, A., Gueorguiev-Rüegg, B., Ehlers, W., O.R., "Multiphasic Modelling of Bone-Cement Injection Into Vertebral Cancellous Bone", International Journal for Numerical Methods in Biomedical Engineering, Vol. 5 (498), p 34–43, 2014 (IF: 2.082, doi: `10.1002/cnm.2696`).

[57] Heidlauf, T., **Röhrle, O.,** "A Multiscale Chemo-electro-mechanical Skeletal Muscle Model to Analyze Muscle Contraction and Force Generation for Different Muscle Fiber Arrangements", Frontiers Physiology, Vol. 5 (498), p 34–43, 2014 (IF: 3.201, doi: `10.3389/fphys.2014.00498`).

Peer-reviewed Journal Articles Published in 2013: 3 Publications

[58] Heidlauf, T., **Röhrle, O.,** "Modeling the Chemoelectromechanical Behavior of Skeletal Muscle Using the Parallel Open-Source Software Library OpenCMISS", Computational and Mathematical Methods in Medicine, Vol. 5 (498), p 155–161, 2013 (IF: 1.563, doi: `10.1155/2013/517287`).

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📱 +49 711 685 66284
ⓘD orcid.org/0000-0002-1934-6525 · 🎓 Google Scholar Profile · 🐦 OR71o

[59] Kieser, J., Farland, M., Jack, H., Farella, M., Wang, Y., Rohrle, O., "The Role of Oral Soft Tissues in Swallowing Function: What Can Tongue Pressure Tell Us?", Australian Dental Journal, Vol. 59, p 155–161, 2013 (IF: 1.401, doi: `10.1111/adj.12103`).

[60] Wang, Y. K., Nash, M. P., Pullan, A. J., Kieser, J. A., **Röhrle, O.,** "Model-based Identification of Motion Sensor Placement for Tracking Retraction and Elongation of the Tongue", Biomechanics and Modeling in Mechanobiology, Vol. 12 (2), p 383–399, 2013, (doi: `10.1007/s10237-012-0407-6`).

Peer-reviewed Journal Articles Published in 2012: 5 Publications

[61] Günther, M., **Röhrle, O.**, Häufele, D., S. S., "Spreading Out Muscle Mass Within a Hill-type Model: a Computer Simulation Study", Computational and Mathematical Methods in Medicine, Vol. 3 (358), vol. 13 pages, 2012 (IF: 1.563, doi: `10.1155/2012/848630`).

[62] Karajan, N., **Röhrle, O.**, Ehlers, W., Schmitt, S., "Linking Continuous and Discrete Intervertebral Disc Models Through Homogenisation", Biomechanics and Modeling in Mechanobiology, Vol. 12 (3), p 453–466, 2012 (IF: 2.082, doi: `10.1007/s10237-012-0416-5`).

[63] Kim, J. H., Trew, M. L., Pullan, A. J., **Röhrle, O.,** "Simulating a Dual-array Electrode Configuration to Investigate the Influence of Skeletal Muscle Fatigue Following Functional Electrical Stimulation", Computers in Biology and Medicine, Vol. 42 (9), p 915–924, 2012, (doi: `10.1016/j.compbiomed.2012.07.004`).

[64] O. R., Davidson, J., Pullan, A., "A Physiologically Based, Multi-scale Model of Skeletal Muscle Structure and Function", Frontiers Physiology, Vol. 3 (358), p 453–466, 2012 (IF: 3.201, doi: `10.3389/fphys.2012.00358`).

[65] Wang, Y., Babarenda Gamage, T., Nielsen, P., Nash, R. O., M.P. "Identification of Tongue Muscle Fibre Group Contraction From MR Images", Biomechanics and Modeling in Mechanobiology, p 453–466, 2012, (doi: `10.1007/978-1-4614-6351-1_16`).

Peer-reviewed Journal Articles Published in 2011: 2 Publications

[66] Bradley, C., Bowery, A., Britten, R., Budelmann, V., Camara, O., Christie, R., Cookson, A., Frangi, A., Gamage, T., Heidlauf, T., Krittian, S., Ladd, D., Little, C., Mithraratne, K., Nash, M., Nickerson, D., Nielsen, P., Nordbø, Ø., Omholt, S., Pashaei, A., Paterson, D., Rajagopal, V., Reeve, A., **Röhrle, O.**, Safaei, S., Sebastian, R., Steghöfer, M., Wu, T., Yu, T., Zhang, H., Hunter, P., "OpenCMISS: A Multi-physics & Multi-scale Computational Infrastructure for the VPH/Physiome Project", Progress in Biophysics and Molecular Biology, Vol. 3 (358), p 32–47, 2011 (IF: 2.703, doi: `10.1016/j.pbiomolbio.2011.06.015`).

[67] **Röhrle, O.**, Köstler, H., Loch, M., "Segmentation of Skeletal Muscle Fibres for Applications in Computational Skeletal Muscle Mechanics", Progress in Biophysics and Molecular Biology, Vol. Computational Biomechanics for Medicine (Soft Tissues and the Musculoskeletal System), p 107–117, 2011 (IF: C, doi: `10.1007/978-1-4419-9619-0_12`).

Peer-reviewed Journal Articles Published in 2010: 1 Publications

[68] **Röhrle, O.** "Simulating the Electro-Mechanical Behavior of Skeletal Muscles", Computing in Science & Engineering, Vol. 12 (6), p 48–58, 2010 (IF: 1.879, doi: `10.1109/mcse.2010.30`).

Peer-reviewed Journal Articles Published in 2009: 4 Publications

[69] Ehlers, W., Markert, B., **Röhrle, O.,** "Computational Continuum Biomechanics with Application to Swelling Media and Growth Phenomena", GAMM-Mitteilungen, Vol. 32 (2), p 135–156, 2009 (IF: 1.47, doi: `10.1002/gamm.200910013`).

[70] **Röhrle, O.**, Waddell, J., Foster, K., Saini, H., Pullan, A., "Using a Motion Capture System to Record Dynamic Articulation for Application in CAD/CAM Software", International Journal of Prosthodontics, Vol. 18 (8), p 703–710, 2009 (IF: 1.533, doi: `10.1111/j.1532-849x.2009.00510.x`).

[71] Saini, H., Wadell, J., Pullan, A., **Röhrle, O.,** "Automatically Generating Subject-Specific Functional Tooth Surfaces Using Virtual Mastication", Annals of Biomedical Engineering, Vol. 37 (8), p 1646–1653, 2009 (IF: 3.474, doi: `10.1007/s10439-009-9725-y`).

[72] Schmid, H., Watton, P., Maurer, M., Wimmer, J., Winkler, P., Wang, Y., **Röhrle, O.**, Itskov, M., "Impact of Transmural Heterogeneities on Arterial Adaptation", Journal of Biomechanics and Modeling in Mechanobiology, Vol. 9 (3), p 295–315, 2009 (IF: 2.829, doi: `10.1007/s10237-009-0177-y`).

Peer-reviewed Journal Articles Published in 2008: 2 Publications

[73] **Röhrle, O.**, Davidson, J., Pullan, A., "Bridging Scales: A Three-dimensional Electromechanical Finite Element Model of Skeletal Muscle", SIAM Journal on Scientific Computing, Vol. 30 (6), p 2882–2904, 2008 (IF: 2.310, doi: `10.1137/070691504`).

[74] Xu, P., Bronlund, J., Potgieter, J., Foster, K., **Röhrle, O.**, Pullan, A., Kieser, J., "Review of the Human Masticatory System and Masticatory Robotics", Mechanism and Machine Theory, Vol. 43 (11), p 1353–1375, 2008 (IF: 3.535, doi: `10.1016/j.mechmachtheory.2008.06.003`).

Peer-reviewed Journal Articles Published in 2007: 2 Publications

[75] Kim, J., Davidson, J., **Röhrle, O.**, Soboleva, T., Pullan, A., "Anatomically Based Lower Limb Nerve Model for Electrical Stimulation", Mechanism and Machine Theory, Vol. BioMedical Engineering OnLine 6 (48), p 1353–1375, 2007 (IF: 2.013, doi: `10.1186/1475-925x-6-48`).

[76] **Röhrle, O.**, Pullan, A. J., "Three-dimensional Finite Element Modelling of Muscle Forces During Mastication", Journal of Biomechanics, Vol. 40 (15), p 3363–3372, 2007 (IF: 2.576, doi: `10.1016/j.jbiomech.2007.05.011`).

Peer-reviewed Journal Articles Published in 2006: 5 Publications

[77] Kim, S., Lee, C., Manteuffel, T., McCormick, S., **Röhrle, O.,** "First Order System Least-Squares For the Oseen Equations", Numerical Linear Algebra with Applications, Vol. 13 (7), p 523–542, 2006 (IF: 1.298, doi: `10.1002/nla.485`).

[78] Manteuffel, T., McCormick, S., **Röhrle, O.,** "Projection Multilevel Methods for Quasilinear Ellipticc Partial Differential Equations: Theoretical Results", SIAM Journal on Numerical Analysis, Vol. 44 (1), p 139–152, 2006 (IF: 2.322, doi: `10.1137/040617704`).

[79] Manteuffel, T., McCormick, S., **Röhrle, O.**, Ruge, J., "Projection Multilevel Methods for Quasilinear Elliptic Partial Differential Equations: Numerical Results", SIAM Journal on Numerical Analysis, Vol. 44 (1), p 120–138, 2006 (IF: 2.322, doi: `10.1137/040617698`).

[80] Schmid, H., Nash, M. P., Young, A. A., **Röhrle, O.**, Hunter, P. J., "A Computationally Efficient Optimization Kernel for Material Parameter Estimation Procedures", Journal of Biomechanical Engineering, Vol. 129 (2), p 279–283, 2006 (IF: 2.025, doi: `10.1115/1.2540860`).

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📱 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · 🎓 Google Scholar Profile · 🐦 OR71o

[81] Wu, M., **Röhrle, O.**, Thorpe, W., Nielsen, P., "Using Three-Dimensional Finite Element Models and Principles of Active Muscle Contraction to Analyse the Movement of the Tongue", Eds. P. Warren & C.I. Watson, Vol. 129 (2), p 354–359, 2006.

[68] **Röhrle, O.** "Simulating the Electro-Mechanical Behavior of Skeletal Muscles", Computing in Science & Engineering, Vol. 12 (6), p 48–58, 2010 (IF: 1.879, doi: `10.1109/mcse.2010.30`).

[69] Ehlers, W., Markert, B., **Röhrle, O.,** "Computational Continuum Biomechanics with Application to Swelling Media and Growth Phenomena", GAMM-Mitteilungen, Vol. 32 (2), p 135–156, 2009 (IF: 1.47, doi: `10.1002/gamm.200910013`).

[70] **Röhrle, O.**, Waddell, J., Foster, K., Saini, H., Pullan, A., "Using a Motion Capture System to Record Dynamic Articulation for Application in CAD/CAM Software", International Journal of Prosthodontics, Vol. 18 (8), p 703–710, 2009 (IF: 1.533, doi: `10.1111/j.1532-849x.2009.00510.x`).

[71] Saini, H., Wadell, J., Pullan, A., **Röhrle, O.,** "Automatically Generating Subject-Specific Functional Tooth Surfaces Using Virtual Mastication", Annals of Biomedical Engineering, Vol. 37 (8), p 1646–1653, 2009 (IF: 3.474, doi: `10.1007/s10439-009-9725-y`).

[72] Schmid, H., Watton, P., Maurer, M., Wimmer, J., Winkler, P., Wang, Y., **Röhrle, O.**, Itskov, M., "Impact of Transmural Heterogeneities on Arterial Adaptation", Journal of Biomechanics and Modeling in Mechanobiology, Vol. 9 (3), p 295–315, 2009 (IF: 2.829, doi: `10.1007/s10237-009-0177-y`).

[73] **Röhrle, O.**, Davidson, J., Pullan, A., "Bridging Scales: A Three-dimensional Electromechanical Finite Element Model of Skeletal Muscle", SIAM Journal on Scientific Computing, Vol. 30 (6), p 2882–2904, 2008 (IF: 2.310, doi: `10.1137/070691504`).

[74] Xu, P., Bronlund, J., Potgieter, J., Foster, K., **Röhrle, O.**, Pullan, A., Kieser, J., "Review of the Human Masticatory System and Masticatory Robotics", Mechanism and Machine Theory, Vol. 43 (11), p 1353–1375, 2008 (IF: 3.535, doi: `10.1016/j.mechmachtheory.2008.06.003`).

[75] Kim, J., Davidson, J., **Röhrle, O.**, Soboleva, T., Pullan, A., "Anatomically Based Lower Limb Nerve Model for Electrical Stimulation", Mechanism and Machine Theory, Vol. BioMedical Engineering OnLine 6 (48), p 1353–1375, 2007 (IF: 2.013, doi: `10.1186/1475-925x-6-48`).

[76] **Röhrle, O.**, Pullan, A. J., "Three-dimensional Finite Element Modelling of Muscle Forces During Mastication", Journal of Biomechanics, Vol. 40 (15), p 3363–3372, 2007 (IF: 2.576, doi: `10.1016/j.jbiomech.2007.05.011`).

[77] Kim, S., Lee, C., Manteuffel, T., McCormick, S., **Röhrle, O.,** "First Order System Least-Squares For the Oseen Equations", Numerical Linear Algebra with Applications, Vol. 13 (7), p 523–542, 2006 (IF: 1.298, doi: `10.1002/nla.485`).

[78] Manteuffel, T., McCormick, S., **Röhrle, O.,** "Projection Multilevel Methods for Quasilinear Ellipticc Partial Differential Equations: Theoretical Results", SIAM Journal on Numerical Analysis, Vol. 44 (1), p 139–152, 2006 (IF: 2.322, doi: `10.1137/040617704`).

[79] Manteuffel, T., McCormick, S., **Röhrle, O.**, Ruge, J., "Projection Multilevel Methods for Quasilinear Elliptic Partial Differential Equations: Numerical Results", SIAM Journal on Numerical Analysis, Vol. 44 (1), p 120–138, 2006 (IF: 2.322, doi: `10.1137/040617698`).

[80] Schmid, H., Nash, M. P., Young, A. A., **Röhrle, O.**, Hunter, P. J., "A Computationally Efficient Optimization Kernel for Material Parameter Estimation Procedures", Journal of

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📱 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · Ⓢ Google Scholar Profile · 🐦 OR71o

Biomechanical Engineering, Vol. 129 (2), p 279–283, 2006 (IF: 2.025, doi: `10.1115/1.2540860`).

[81] Wu, M., **Röhrle, O.**, Thorpe, W., Nielsen, P., "Using Three-Dimensional Finite Element Models and Principles of Active Muscle Contraction to Analyse the Movement of the Tongue", Eds. P. Warren & C.I. Watson, Vol. 129 (2), p 354–359, 2006.

Books, Edited Books, or Books Chapters

[1] Bleiler, C., **Röhrle, O.,** "Classification of biomechanical models: The wrong battle between phenomenological and structural approaches, the partly underestimated strength of phenomenology and challenges for future (clinical) applications" in "Solid (Bio)mechanics: Challenges of the Next Decade", Editor(s): G. Sommer, and K. Li, and D. C. Haspinger, and R. W.Ogden, 2021.

[2] Krämer, A., Maier, B., Rau, T., Huber, F., Klotz, T., Ertl, T., Göddeke, D., Mehl, M., Reina, G., **Röhrle, O.,** "Multi-physics Multi-scale HPC Simulations of Skeletal Muscles" in "High Performance Computing in Science and Engineering '20", Editor(s): W. E. Nagel, and D. H. Kröner, and M. M. Resch, p 185–203, 2021.

[3] Wnuk, M., Jaensch, F., Tomzik, D. A., Chen, Z., Terfurth, S., Shahabi, J., Garrett, A., Mahmoudinezhad, M. H., Csiszar, A., Xu, W. L., **Röhrle, O.**, Verl, A., "Challenges in Robotic Soft Tissue Manipulation – Problem Identification Based on an Interdisciplinary Case Study of a Teleoperated Drawing Robot in Practice" in "Mechatronics and Machine Vision in Practice 4", Editor(s): J. Billingsley, and P. Brett, p 245–262, 2021, (doi: `10.1007/978-3-030-43703-9_20`).

[4] **Röhrle, O.**, "Skeletal Muscle Modelling" in "Encyclopedia of Continuum Mechanics", Editor(s): H. Altenbach, and A. Öchsner, 2020, (doi: `10.1007/978-3-662-55771-6_39`).

[5] Röhrle, A., Kleiner, B., Dolar, C., Ulrich, M., Abdelrahman, Y., Yang, B., Schmidt, A., **Röhrle, O.,** "Untersuchungen für feuerwehrtaugliche Wärmebildkameras", Editor(s): 2019.

[6] Asgharzadeh, P., Özdemir, B., Müller, S. J., **Röhrle, O.**, Reski, R., "Analysis of Physcomitrella Chloroplasts to Reveal Adaptation Principles Leading to Structural Stability at the Nano-Scale" in "Biomimetic Research for Architecture and Building Construction", Editor(s): K. Knippers J. Nickel, and T. Speck, p 261–275, 2016, (doi: `10.1007/978-3-319-46374-2_13`).

[7] Betz, O., Birkhold, A., Caliaro, M., Eggs, B., Mader, A., Knippers, J., **Röhrle, O.**, Speck, O., "Adaptive Stiffness and Joint-Free Kinematics: Actively Actuated Rod-Shaped Structures in Plants and Animals and Their Biomimetic Potential" in "Biomimetic Research for Architecture and Building Construction", Editor(s): K. Knippers J. Nickel, and T. Speck, p 135–167, 2016.

[8] Schmitt, S., Lechler, A., **Röhrle, O.,** "Modellierung und Simulation als Werkzeug für das Design von Mensch-Maschine-Systemen" in "Technische Unterstützungssysteme, die die Menschen wirklich wollen", Editor(s): Weidner, and Rehlich, p 129–134, 2015.

[9] **Röhrle, O.**, Sprenger, M., Ramasamy, E., Heidlauf, T., "Multi-Scale Skeletal Muscle Modelling: From Cellular Level to a Multi-Segment Skeletal Muscle Model of the Upper Limb" in "Computer Models in Biomechanics", Editor(s): G. Holzapfel, and E. Kuhl, p 63–75, 2013, (doi: `10.1007/978-94-007-5464-5_8`).

[10] Edited together with W. Ehlers, and B. Markert the "GAMM-Mitteilungen", vol. 32(2), 2009.

Patents

[11] **Röhrle, O.**, *"Verfahren zur Bestimmung einer Beißkraft"*, (DE 102013211623 B4) Status: Filed on Jun. 6, 2013, Published on Dec. 24, 2014, Granted on Apr. 7, 20162013,

[12] **Röhrle, O.**, Kleiner, B., Hülsmann, A., Röhrle, A., *"Mobile radar-basierte Umgebungsvermessung unter Anwendung von Sensorfusion mittels Intrarotkameraund Inertialsensorik"*, (DE 102013211623 B4) Status: Filed on Feb. 23, 20152013,

[13] Smith, N. P., Budgett, D. M., Hunter, P. J., Malcolm, D. T. K., Cheng, L. K.-W., Nash, M. P., Nielsen, P. M. F., Pullan, A. J., Young, A. A., **Röhrle, O.**, *"Biophysical virtual model database and applications"*, (US Patent App. 12/375,354 / WO 2008/015565 A3) Status: Filed on Aug. 3, 2008, Published on Apr. 29, 20102008,

Conference Contributions

[14] Asgharzadeh, P., Birkhold, A. I., Özdemir, B., Reski, R., **Röhrle, O.,** "Biopolymer Segmentation From CLSM Microscopy Images Using a Convolutional Neural Network", Proceedings of Applied Mathematics and Mechanics (PAMM), Vol. 20 (1), e202000188, 2021, (doi: `https://doi.org/10.1002/pamm.202000188`).

[15] Trivedi, Z., Bleiler, C., Gehweiler, D., Gueorguiev-Rüegg, B., Ricken, T., Wagner, A., **Röhrle, O.,** "Simulating Vertebroplasty: A Biomechanical Challenge", Proceedings of Applied Mathematics and Mechanics (PAMM), Vol. 20 (1), e202000313, 2021, (doi: `https://doi.org/10.1002/pamm.202000313`).

[16] Villota-Narvaez, Y., Ramírez-Martínez, A., Garzón-Alvarado, D., **Röhrle, O.,** "A Dynamical Model for the Calcineurin-NFATc Signaling Pathway and Muscle Fiber Shifting", Proceedings of Applied Mathematics and Mechanics (PAMM), Vol. 20 (1), e202000274, 2021, (doi: `https://doi.org/10.1002/pamm.202000274`).

[17] Wnuk, M.-C., Jaensch, F., Tomzik, D. A., Chen, Z., Terfurth, J., Kandasamy, S., Shahabi, J., Garrett, A., Mahmoudinezhad, M. H., Csiszar, A., Xu, P., **Röhrle, O.**, Verl, A., (2020). "Supplemental Material for Case Study About Challenges in Soft Tissue Manipulation",

[18] Bleiler, C., **Röhrle, O.,** (2019). "An Invariant-based Formulation for Transversely Isotropic Microsphere Models with Application to Biomechanics", presented at the 90th Annual Meeting of the GAMM, 18.-22.3.2019, Vienna, Austria.

[19] Schmid, L., Klotz, T., Siebert, T., **Röhrle, O.,** (2019). "Simulating Electromechanical Delay by Using a Multi-scale Model of the Muscle-tendon Complex", presented at the 90th Annual Meeting of the GAMM, 18.-22.3.2019, Vienna, Austria.

[20] Trivedi, Z., Bleiler, C., Wagner, A., **Röhrle, O.,** (2019). "Parametric Investigation of Permeability of Vertebral Bone Assuming a Regular Microstructure", presented at the 90th Annual Meeting of the GAMM, 18.-22.3.2019, Vienna, Austria.

[21] Altan, E., Gizzi, L., Göktepe, S., **Röhrle, O.,** (2018). "Modelling Isometric-exercise-induced Skeletal Muscle Adaptation", presented at the 8th World Congress of Biomechanics, 8.-12.7.2018, Dublin, Irland.

[22] Altan, E., Gizzi, L., **Röhrle, O.,** (2018). "Modelling Voluntary Contraction Capabilities of Vastus Lateralis Using a Motor Unit Recruitment Model", presented at the 89th Annual Meeting of the GAMM, 19.-23.3.2018, Munich, Germany.

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📱 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · 🎓 Google Scholar Profile · 🐦 OR71o

[23] Asgharzadeh, P., Birkhold, A., Özdemir, B., Reski, R., **Röhrle, O.,** (2018). "Structural Classification of Confocal Microscopy Images Using Machine Learning", presented at the 89th Annual Meeting of the GAMM, 19.-23.3.2018, Munich, Germany.

[24] Asgharzadeh, P., Özdemir, B., Reski, R., **Röhrle, O.**, Birkhold, A., (2018). "A Feature-Based Deep Learning Approach for Classification of Protein Networks Using 3D Live Microscopic Data", presented at the 8th World Congress of Biomechanics, 8.-12.7.2018, Dublin, Irland.

[25] Bleiler, C., Ponte Castañeda, P., **Röhrle, O.,** (2018). "A Microstructurally?based Material Model for the Description of Skeletal Muscle Tissue", presented at the Virtual Physiological Human 2018, 5.-7.9.2018, Zaragossa, Spain.

[26] Bleiler, C., Ponte Castañeda, P., **Röhrle, O.,** (2018). "Homogenisation-based Modelling of Skeletal Muscle Tissue Across the Scales", presented at the World Congress on Computational Mechanics 2018, 22.-27.7.2018, New York City (USA). ,

[27] Bleiler, C., Ponte Castañeda, P., **Röhrle, O.,** (2018). "Homogenisation-based Multiscale Modelling of Skeletal Muscle Tissue", presented at the 89th Annual Meeting of the GAMM, 19.-23.3.2018, Munich, Germany.

[28] Haeufle, D., Wirtz, D., Kraschewski, K., Schmitt, S., **Röhrle, O.,** (2018). "A Simulation Study on Wobbling Masses: Eigen-frequency and Force-coupling to the Skeleton Change with Muscle Activity", presented at the 8th World Congress of Biomechanics, 8.-12.7.2018, Dublin, Irland.

[29] Klotz, T., Bleiler, C., **Röhrle, O.,** (2018). "Modelling the Active Behaviour of Striated Muscle Tissue in Continuum Mechanics", presented at the 89th Annual Meeting of the GAMM, 19.-23.3.2018, Munich, Germany.

[30] Klotz, T., Gizzi, L., **Röhrle, O.,** (2018). "Modeling the Electrical Activity of Skeletal Muscle Tissue Using a Generalized Bidomain Approach." presented at the 8th World Congress of Biomechanics, 8.-12.7.2018, Dublin, Irland.

[31] Klotz, T., Gizzi, L., **Röhrle, O.,** (2018). "Simulating Electromyography (EMG) Signals by Using a Generalized Bidomain Approach", presented at the Virtual Physiological Human 2018, 5.-7.9.2018, Zaragossa, Spain.

[32] Maier, B., Emamy, N., Göddeke, D., Klotz, T., Krämer, A., Mehl, M., **Röhrle, O.,** (2018). "A Realistic HPC Model of the Neuromuscular System", presented at the 8th World Congress of Biomechanics, 8.-12.7.2018, Dublin, Irland.

[33] Morales, S., **Röhrle, O.,** (2018). "Towards the Generation of Dry Patient-specific Human Aortic Valve Models From Medical Imaging Data", presented at the 89th Annual Meeting of the GAMM, 19.-23.3.2018, Munich, Germany.

[34] Ramasamy, E., Avci, O., Dorow, B., Gizzi, L., **Röhrle, O.,** (2018). "A Workflow to Investigate Patient-specific Prosthetic Devices", presented at the 2nd International Symposium on Innovations in Amputation Surgery and Prosthetic Technologies, 10.-12.5.2018, Vienna, Austria.

[35] **Röhrle, O.**, Avci, O., Valentin, J. P., D. S., M., (2018). "Modelling the Musculoskeletal System: a Two-muscle Upper Arm Model", presented at the World Congress on Computational Mechanics 2018, 22.-27.7.2018, New York City (USA).

[36] **Röhrle, O.**, Gizzi, L., Avci, O., Bleiler, C., Klotz, T., (2018). "Computational Challenges in Multi-scale Modelling of the Neuromuscular System", presented at the 8th World Congress of Biomechanics, 8.-12.7.2018, Dublin, Irland.

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📱 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · 🎓 Google Scholar Profile · 🐦 OR71o

[37] **Röhrle, O.**, Valentin, J., Sprenger, M., Avci, O., Pflüger, D., (2018). "Modelling the Musculoskeletal System: a Two-muscle Upper Arm Model", presented at the Virtual Physiological Human 2018, 5.-7.9.2018, Zaragossa, Spain.

[38] Saini, H., Altan, E., Ramasamy, E., Ates, F., **Röhrle, O.,** (2018). "Predicting Skeletal Muscle Force From Motor-unit Activity Using 3D FEM", presented at the 89th Annual Meeting of the GAMM, 19.-23.3.2018, Munich, Germany.

[39] Varga, P., Schneider, M., Buschbaum, J., Joeris, A., **Röhrle, O.**, Dwyer, J., Slongo, T., Gueorguiev, B., (2018). "Biomechanical Analysis of Paediatric Long Bone Growth Modulation Treatment by Patient-specific Finite Element Modelling", presented at the 8th World Congress of Biomechanics, 8.-12.7.2018, Dublin, Irland.

[40] Altan, E., Gizzi, G., **Röhrle, O.,** (2017). "SModelling the Adaptation of Skeletal Muscles in Response to Isometric Exercise", presented at the International Conference on Computational Biomechanics 2017 (ICCB2017), 6.-8.9.2017, Compiège, France.

[41] Asgharzadeh, P., Birkhold, A., **Röhrle, O.,** (2017). "Estimation of Transpiration Rate in Herbaceous Plants Using Theory of Porous Media", presented at the Proceedings of the 88th Annual Meeting of the GAMM, 6.-10.3.2017, Weimar, Germany.

[42] Asgharzadeh, P., Özdemir, B., Reski, R., **Röhrle, O.**, Birkhold, A., (2017). "An Image Processing Framework to Quantify the Structure of Protein Networks", presented at the 23rd Congress of the European Society of Biomechanics, 2.-5.7.2017, Seville, Spain.

[43] Asgharzadeh P. B., A. I. C., M. S., O. R., O., (2017). "Hydraulics of Vascular Fluid Transport in Herbaceous Plants Using the Theory of Porous Media", presented at the 23rd Congress of the European Society of Biomechanics, 2.-5.7.2017, Seville, Spain.

[44] Birkhold, A., Asgharzadeh, P., Farack, L., **Röhrle, O.**, Checa, S., Zaslansky, P., Willie, B., (2017). "3D Mapping of Bone Adaption on the Cellular Level with Tissue Level Remodelling", presented at the International Conference on Biomedical Technology (IBCT) 2017, 6.-8.11.2017, Hannover, Germany.

[45] Bleiler, C., Ponte Castañeda, P., **Röhrle, O.,** (2017). "A Homogenisation Method for the Multiscale Modelling of Transversely Isotropic Skeletal Muscle Tissue", presented at the Proceedings of the 88th Annual Meeting of the GAMM, 6.-10.3.2017, Weimar, Germany.

[46] Bleiler, C., Ponte Castañeda, P., **Röhrle, O.,** (2017). "A Novel Microstructurally-based Material Model to Describe Skeletal Muscle Tissue", presented at the EUROMECH Colloquium 585: Advanced Experimental Methods in Tissue Biomechanics, 12.-16.2.2017, Burg Warberg, Germany.

[47] Bleiler, C., Ponte Castañeda, P., **Röhrle, O.,** (2017). "Modelling Skeletal Muscle Tissue Across Multiple Scales", presented at the ECCOMAS Thematic Conference on Computational Modeling of Complex Materials across the Scales (CMCS), 7.-9.11.2017, Paris, France.

[48] Klotz, T., Emamy, N., Ertl, T., Göddeke, G., Krämer, A., Krone, M., Maier, B., Mehl, M., Rau, T., **Röhrle, O.,** (2017). "Modelling the Neuromuscular System Using HPC Systems", presented at the Proceedings of the 7th GACM Colloquium on Computational Mechanics, 11.-13.10.2017, Stuttgart, Germany.

[49] Klotz, T., Heidlauf, T., Rode, C., Siebert, T., **Röhrle, O.,** (2017). "A Multi-scale Continuum Mechanical Model of Skeletal Muscle Mechanics Predicting Force Enhancement Based on Actin-titin Interaction", presented at the EUROMECH Colloquium 585: Advanced Experimental Methods in Tissue Biomechanics, 12.-16.2.2017, Burg Warberg, Germany.

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📱 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · 🎓 Google Scholar Profile · 🐦 OR71o

[50] Krohn, B., Sathar, S., **Röhrle, O.**, Vanderwinden, J.-M., O?Grady G. C., L.K., (2017). "A Framework for Simulating Gastric Electrical Propagation in Confocal Microscopy Derived Geometries", presented at the Proceedings of 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 11.-15.7.2017, Jeju Island, Korea.

[51] Mader, A., Birkhold, A., Caliaro, M., Speck, O., **Röhrle, O.**, Knippers, J., (2017). "Plant-inspired Compliant Actuation", presented at the Proceedings of the 7th GACM Colloquium on Computational Mechanics, 11.-13.10.2017, Stuttgart, Germany.

[52] Morales, S., **Röhrle, O.,** (2017). "Development of Patient-specifc Computational Models of the Human Aortic Valve Ander Healthy and Diseased Conditionsa", presented at the Proceedings of the 88th Annual Meeting of the GAMM, 6.-10.3.2017, Weimar, Germany.

[53] **Röhrle, O.**, Saini, H., Lee, P., Ackland, D., (2017). "Determining Realistic Dynamic Loading Conditions on Human Molars During Biting by Means of Finite Element Simulations", presented at the International Conference on Biomedical Technology (IBCT) 2017, 6.-8.11.2017, Hannover, Germany.

[54] **Röhrle, O.**, Saini, H., Lee, P., Ackland, D., (2017). "Determining Realistic Dynamic Loading Conditions on Human Molars During Biting by Means of Finite Element Simulations", presented at the ECCOMAS International Conference on Biomedical Technology, 6.-8.11.2017, Hannover, Germany.

[55] Saini, H., Gizzi, G., Ateş, F., **Röhrle, O.,** (2017). "Subject-specific 3D Musculoskeletal Simulations of the Human Tibialis Anterior", presented at the International Conference on Computational Biomechanics 2017 (ICCB2017), 6.-8.9.2017, Compiège, France.

[56] Altan, E., Zöllner, A., Avci, O., **Röhrle, O.,** (2016). "Towards Modelling Skeletal Muscle Growth and Adaptation", presented at the XXIV ICTAM, 21.-26.8.2016, Montreal, Canada.

[57] Asgharzadeh, P., **Röhrle, O.,** (2016). "Analysis of Physcomitrella Chloroplasts to Reveal Adaptation Principles Leading to Structural Stability at the Nanoscale", presented at the Proceedings in Applied Mathematics and Mechanics, 7.-11.3.2016, Braunschweig, Germany.

[58] Bleiler, C., Ponte Castañeda, P., **Röhrle, O.,** (2016). "A Novel Microstructurally-based Material Model to Describe Passive Skeletal Muscle Tissue", presented at the XXIV ICTAM, 21.-26.8.2016, Montreal, Canada.

[59] Bleiler, C., Ponte Castañeda, P., **Röhrle, O.,** (2016). "Multiscale Modelling of Skeletal Muscle Tissue by Incorporating Microstructural Effects", presented at the Proceedings in Applied Mathematics and Mechanics, 7.-11.3.2016, Braunschweig, Germany.

[60] Gizzi, L., **Röhrle, O.**, Petzke, F., Falla, D., (2016). "People with Chronic Low Back Pain Show Reduced Movement Complexity During Daily Activities", presented at the XXI ISEK Conference Book of Proceedings, 5.-8.7.2016, CHicago, IL, USA.

[61] Heidlauf, T., Klotz, T., **Röhrle, O.,** (2016). "A Model of Actin-titin Interactions Provides Stability on the Descending Limb of the Force-length Relation in a Multi-scale Continuum-mechanical Finite Element Model of Skeletal Muscle", presented at the Joint Annual Meeting of the GAMM and DMV, 7.-11.3.2016, Braunschweig, Germany.

[62] Heidlauf, T., **Röhrle, O.,** (2016). "Multiscale and Multiphysics Modelling of Skeletal Muscle Contractions", presented at the Joint Annual Meeting of the GAMM and DMV, 7.-11.3.2016, Braunschweig, Germany.

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · ☎ +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · 🎓 Google Scholar Profile · 🐦 OR71o

[63] Hessenthaler, A., Gaddum, N., Holub, O., Sinkus, R., **Röhrle, O.**, Nordsletten, D., (2016). "3D Fluid-Structure Interaction Benchmark Experiment", presented at the Joint Annual Meeting of the GAMM and DMV, 7.-11.3.2016, Braunschweig, Germany.

[64] Klotz, T., Heidlauf, T., **Röhrle, O.,** (2016). "Using a Multiplicative Decomposition of the Deformation Gradient Tensor to Model Active Skeletal Muscle Behaviour", presented at the Joint Annual Meeting of the GAMM and DMV, 7.-11.3.2016, Braunschweig, Germany.

[65] Mordhorst, M. W., D. R., O., (2016). "Model Order Reduction of Dynamic Skeletal Muscle Models", presented at the Joint Annual Meeting of the GAMM and DMV, 7.-11.3.2016, Braunschweig, Germany.

[66] Sprenger, M., **Röhrle, O.,** (2016). "A Two-Muscle, Three-Dimensional, Continuum-Mechanical, Forward-Dynamics Simulation of the Upper Limb", presented at the World Congress on Computational Mechanics, 24.-29.7.2016, Seoul, South Korea.

[67] Sprenger, M., **Röhrle, O.,** (2016). "A Two-Muscle, Three-Dimensional, Continuum-Mechanical, Forward-Dynamics Simulation of the Upper Limb", presented at the Joint Annual Meeting of the GAMM and DMV, 7.-11.3.2016, Braunschweig, Germany.

[68] Chong, S.-Y., Gurumurthy P.K. R., O., (2015). "Exploring the Use of Non-Image-based Ultrosoand to Detect the Position of the Residual Femur Within a Stump", presented at the Proceedings of the International Conference on Biomedical Technology 2015, 28.-30.10.2015, Hannover, Germany.

[69] Hessenthaler, A., **Röhrle, O.**, Nordsletten, D., (2015). "Using a Non-conforming Monolithic Fluid-structure Interaction Method to Solve the 3D FSI Benchmark Challenge", presented at the Proceedings of the 4th International Conference on Computational and Mathematical Biomedical Engineering (CMBE 2015), 29.6.-1.7.2015, Cachan, France.

[70] Mordhorst, M., Wirtz, D., **Röhrle, O.,** (2015). "POD-DEIM Reduction of Dynamic Skeletal Muscle Models", presented at the 6. Workshop junger Nachwuchswissenschaftler in der Mechanik, 9.-13.3.2015, Zell am See, Austria.

[71] **Röhrle, O.**, Heidlauf, T., (2015). "Chemo-electro-mechanical Modelling of Skeletal Muscle Mechanics", presented at the Engineering Mechanics Institute Conference, 16.-19.6.2015, Stanford, CA (USA).

[72] **Röhrle, O.**, Heidlauf, T., (2015). "Chemo-electro-mechanical Modelling of Skeletal Muscle Mechanics", presented at the 15th PAN-American Congress on Applied Mechanics, 18.-21.5.2015, Urbana-Champaign, IL (USA).

[73] Bleiler, C., Wagner, A., Stadelmann, V., Windolf, M., Köstler, H., Boger, A., Gueorguiev-Rüegg, B., Ehlers, W., **Röhrle, O.,** (2014). "Multiphasic Modelling of the Vertebral Bone for Cement-Injection Studies", presented at the Proceedings of Applied Mathematics and Mechanics (PAMM), 10.-14.3.2014, Nürnberg, Germany.

[74] Heidlauf, T., **Röhrle, O.,** (2014). "Multi-Scale Modelling of the Neuromuscular System Using the Open-Source Software Library OpenCMISS." presented at the Virtual Physiological Human (VPH) Conference, 9.-12.9.2014, Trondheim, Norway.

[75] Heidlauf, T., **Röhrle, O.,** (2014). "Multiscale Modelling of Skeletal Muscles", presented at the 7th World Congress of Biomechanics, 6.-11.3.2014, Boston, MA (USA).

[76] Heidlauf, T., **Röhrle, O.,** (2014). "Multiscale Modelling of Skeletal Muscles." presented at the 12th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering (CMBBE), 13.-15.10.2014, Amsterdam, The Netherlands.

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📞 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · 🎓 Google Scholar Profile · 🐦 OR71o

[77] Heidlauf, T., **Röhrle, O.,** (2014). "Multiscale Modelling of the Neuromuscular System." presented at the 5th Workshop of Young Investigators in Mechanics - Focus Biomechanics, 8.-13.2.2014, Zell am See, Austria.

[78] Mordhorst, M., Heidlauf, T., **Röhrle, O.,** (2014). "Mathematically Modelling Surface EMG Signals", presented at the Proceedings of Applied Mathematics and Mechanics (PAMM), 10.-14.3.2014, Nürnberg, Germany.

[79] Mordhorst, M., Heidlauf, T., **Röhrle, O.,** (2014). "Mathematically Modelling Surface EMG Signals", presented at the 5. Workshop junger Nachwuchswissenschaftler in der Mechanik, 8.-13.2.2014, Zell am See, Austria.

[80] Mordhorst, M., Heidlauf, T., **Röhrle, O.,** (2014). "Towards a Simulation-based EMG Benchmark for Analysing Motor Unit Firing Strategies", presented at the The XX Congress of the International Society of Electrophysiology and Kinesiology (ISEK), 15.-18.7.2014, Rome, Italy.

[81] Mordhorst, M., Wirtz, D., **Röhrle, O.,** (2014). "POD-DEIM Reduction of Dynamic Skeletal Muscle Models", presented at the 2nd International Workshop on Order-Reduction Methods for application to mechanics of materials (2nd WORM 2014), 27.-29.8.2014, Germany.

[82] **Röhrle, O.**, Mordhorst, M., Heidlauf, T., (2014). "From Motorunit Control to Virtual EMG", presented at the 7th World Congress of Biomechanics, 6.-11.7.2014, Boston, MA (USA).

[83] Hedilauf, T., Röhrle, O., (2013). "On the Treatment of Actively Generated Force in Continuum Muscle Mechanics", presented at the Proceedings der 84 GAMM Jahrestagung, 18.-22.3.2013, Novi Sad, Serbien.

[84] Heidlauf, T., Negro, F., D. F., O. R., (2013). "Multiscale Modelling of The Neuromuscular System", presented at the Proceedings of the 11th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, 3.-7.4.2013, Salt Lake City, Utah (USA).

[85] Heidlauf, T., Negro, F., Farina, D., **Röhrle, O.,** (2013). "An Integrated Model of the Neuromuscular System", presented at the 6th International IEEE EMBS Conference on Neural Engineering, 6.-8.11.2013, San Diego, CA (USA).

[86] Mordhorst, M., Heidlauf, T., **Röhrle, O.,** (2013). "Mathematically Modelling Surface EMG Signals", presented at the Second DEMOVE Symposium at UMG, 22.-23.10.2013, Göttingen, Germany.

[87] **Röhrle, O.**, (2013). "Modelling Neuromuscular Recruitment Using a Realistic Electro-mechanical 3D FE Skeletal Muscle Model", presented at the MuscleUp-Workshop, 13.-15.2.2013, Gold Coast, Australia.

[88] **Röhrle, O.**, Sprenger, M., (2013). "Towards Modelling the Dynamics of a 3d Continuum-Mechanical Two-Muscle Musculoskeletal System", presented at the Proceedings der 84. GAMM Jahrestagung, 18.-22.3.2013, Novi Sad, Serbien.

[89] Sprenger, M. S., S. W., Y. O. R., (2013). "Modeling the Dynamics of a 3D Continuum-Mechanical Two-Muscle Musculoskeletal System", presented at the Proceedings of the 11th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, 3.-7.4.2013, Salt Lake City, Utah (USA).

[90] Heidlauf, T., **Röhrle, O.,** (2012). "A Neuronal-recruited Geometrical Model of Skeletal Muscle", presented at the ECCOMAS, 10.-14.9.2012, Vienna, Austria.

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📱 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · Ⓖ Google Scholar Profile · 🐦 OR71o

[91] Heidlauf, T., **Röhrle, O.,** (2012). "A Neuronal-recruited Geometrical Model of Skeletal Muscle", presented at the 83nd Annual Meeting of the GAMM, 26.-30.3.2012, Darmstadt, Germany.

[92] Karajan, N., Otto, D., Ehlers, W., Rupp, T., Schmitt, S., O. R., (2012). "A Novel Mathematical Homogenisation Technique to Link Tissue Scale Properties of the Intervertebral Disc to Whole Organ System Simulations of the Lumbar Spine", presented at the VPH Meeting, 18.-20.9.2012, London, UK.

[93] **Röhrle, O.**, (2012). "The Virtual Orthopedic Lab", presented at the Innovation Forum at the MEDTEC Europe, 13.-15.3.2012, Stuttgart, Germany.

[94] **Röhrle, O.**, (2012). "Workshop on Sustained Simulation Performance", presented at the Workshop on Sustained Simulation Performance, 10.-11.10.2012, Stuttgart, Germany.

[95] **Röhrle, O.**, Karajan, N., Schmitt, S., Ramasamy, E., Dorow, B., Schneider, U., (2012). "Virtual Orthopedic Lab", presented at the DKOU, 22.-25.10.2012, Berlin, Germany.

[96] **Röhrle, O.**, Saini, H., (2012). "3D Analysis of Stresses Within Molars During Natural Clenching", presented at the 83nd Annual Meeting of the GAMM, 26.-30.3.2012, Darmstadt, Germany.

[97] Sprenger, M., **Röhrle, O.**, Schmitt, S., (2012). "Coupling 3D and 1D Skeletal Muscle Models", presented at the 83nd Annual Meeting of the GAMM, 26.-30.3.2012, Darmstadt, Germany.

[98] Wang, Y., Nash, M., **Röhrle, O.,** (2012). "Model-based Identification of Motion Sensor Placement for Tracking Propulsion and Elongation of the Tongue", presented at the ECCOMAS, 10.-14.9.2012, Vienna, Austria.

[99] Wang, Y., Nash, M., **Röhrle, O.,** (2012). "Model-based Identification of Motion Sensor Placement for Tracking Tongue Movements", presented at the ESMC, 9.-13.7.2012, Graz, Austria.

[100] Karajan, N., Ehlers, W., **Röhrle, O.**, Schmitt, S., (2011). "Homogenisation Method to Capture the Non-Linear Behaviour of Intervertebral Discs in Multi-Body Systems", presented at the 82nd Annual Meeting of the GAMM, 18.-21.4.2011, Graz, Austria.

[101] Köstler H. R., O., (2011). "A Fast GPU-based Method for Image Segmentation", presented at the SIAM Conference on Computational Science and Engineering, 28.2.-4.3.2011, Reno, NV (USA).

[102] **Röhrle, O.**, (2011). "Modeling the Electromechanical Behavior of Skeletal Muscle and Its Applications", presented at the IUTAM Symposium on Computer Models in Biomechanics, 29.8.-2.9.2011, Stanford University, Palo Alto CA (USA).

[103] **Röhrle, O.**, (2011). "Volumetric Skeletal Muscle Modelling: Principles of Forward and Inverse Dynamics", presented at the PoroMed 2011, 23.-25.3.2011, Freudenstadt, Germany.

[104] **Röhrle, O.**, Kim, J., (2011). "A Multi-Scale Electro-Mechanically Coupled Skeletal Muscle Model to Investigate Its Function and Structure", presented at the 7. Jahrestagung der Deutschen Gesellschaft für Biomechanik (DGfB), 19.-21.5.2011, Murnau, Germany.

[105] **Röhrle, O.**, Ramasamy, E., (2011). "Principles of Forward Dynamics Applied to a Three-dimensional Continuum-mechanical Model of the Upper Limb", presented at the 82nd Annual Meeting of the GAMM, 18.-21.4.2011, Graz, Austria.

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📱 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · 🔍 Google Scholar Profile · 🐦 OR71o

[106] Sprenger, M., **Röhrle, O.,** (2011). "On The Coupling of 1D-3D Muscle Models for Lumbar Spine Mechanics", presented at the 82nd Annual Meeting of the GAMM, 18.-21.4.2011, Graz, Austria.

[107] Wang, Y., **Röhrle, O.**, Nielsen P.F. P., A.J. K., J. N., M.P., (2011). "Investigating Muscle Co-Activation During Tongue Elongation Using an Anatomically-Based Finite Element Model of the Tongue", presented at the 23rd Congress of the International Society of Biomechanics (ISB), 3.-7.7.2011, Brussels, Belgium.

[108] **Röhrle, O.**, Davidson, J., Pullan, A., (2010). "Analyzing Function and Structure of Skeletal Muscle", presented at the Proceedings of the World Congress on Computational Mechanics, 19.-23.7.2010, Sydney, Australia.

[109] **Röhrle, O.**, Karajan, N., Heidlauf, T., Sprenger, M., Rupp, T., Schmitt, S., Ehlers, W., (2010). "Towards a Better Understanding of Skeletal Muscle Models On Lumbar Spine Mechanics", presented at the Proceedings of the World Congress on Biomechanics, 1.-6.8.2010, Singapore, Singapore.

[110] **Röhrle, O.**, Kim, J., (2010). "Analysing the Influence of Multi-Array Electrode Surface Stimulation Protocols on Skeletal Muscle Activation and Fatigue", presented at the 81st Annual Meeting of the GAMM, 22.-26.3.2010, Karlsruhe, Germany.

[111] Wang, Y., **Röhrle, O.**, Nash, M., Nielsen, P., Pullan, A., (2010). "Modelling of Tongue Movement", presented at the Proceedings of the World Congress on Computational Mechanics, 19.-23.7.2010, Sydney, Australia.

[112] **Röhrle, O.**, Davidson, J., Pullan, A., (2009). "A Computational Framework to Investigate the Functional Organisation and Structure of Skeletal Muscle", presented at the Proceedings of the 1st International Conference on Material Modelling (ICMM), 15.-17.9.2009, Dortmand, Germany.

[113] **Röhrle, O.**, Davidson, J., Pullan, A., (2009). "Bridging Scales: A Three-Dimensional Electromechanical Finite Element Model of Skeletal Muscle", presented at the SIAM Computational Science and Engineering Annual Meeting, 2.-6.3.2009, Miami, FL (USA).

[114] **Röhrle, O.**, Davidson, J., Pullan, A., (2009). "Skeletal Muscle Tissue: An Electromechanically-Coupled Material", presented at the 3rd GACM Colloquium on Computational Mechanics, 21.-23.9.2009, Hannover, Germany.

[115] **Röhrle, O.**, Davidson, J., Pullan, A., (2009). "Towards a Computational Framework for Investigating Function and Structure of Skeletal Muscle", presented at the 3rd GACM Colloquium on Computational Mechanics, 21.-23.9.2009, Hannover, Germany.

[116] Wang, Y., Pullan, A., Schmid, H., **Röhrle, O.,** (2009). "Modelling of Interlacing Muscle Fibres Within the Tongue", presented at the 80th Annual Meeting of the GAMM, 9.-13.2.2009, Danzig, Poland.

[117] Davidson, J., **Röhrle, O.**, Kim, J., Shorten, P., Pullan, A., (2008). "Modelling the Electrical and Mechanical Action of the Tibialis Anterior", presented at the EPSM ABEC 2008, 16.-20.11.2008, Christchurch, New Zealand.

[118] Davidson, J., **Röhrle, O.**, Pullan, A., (2008). "Modelling the Structure and Physiology of Skeletal Muscle", presented at the MedSci 2008, 25.-28.11.2008, Queenstown, New Zealand.

[119] **Röhrle, O.**, Davidson, J., Kim, J., Pullan, A., (2008). "A Three-Dimensional Finite Element Framework for Investigating Functional Electrical Stimulation Protocols", presented at the

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📱 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · 🎓 Google Scholar Profile · 🐦 OR71o

15th Workshop for "The Finite Element Method in Biomedical Engineering Biomechanics and Related Fields", 16.-17.7.2008, Ulm, Germany.

[120] **Röhrle, O.**, Davidson, J., Kim, J., Pullan, A., (2008). "A Three-Dimensional Finite Element Framework for Investigating Functional Electrical Stimulation Protocols", presented at the 8th World Congress on Computational Mechanics (WCCM8), 30.6.-5.7.2008, Venice, Italy.

[121] **Röhrle, O.**, Davidson, J., Kim, J., Pullan, A., (2008). "A Three-Dimensional Framework for Investigating Functional Electrical Stimulation Protocols Used for the Lower Limb", presented at the Pacific Symposium on Biocomputing (PSB), 4.-8.1.2008, Hawaii (USA).

[122] **Röhrle, O.**, Davidson, J., Kim, J., Pullan, A., (2008). "BRIDGING SCALES: An Attempt to Incorporate Cellular Responses Within a 3D FEM Model of Active Muscle Contraction", presented at the Proceedings of Applied Mathematics and Mechanics (PAMM),

[123] **Röhrle, O.**, Kim, J., Davidson, J., Pullan, A., (2008). "A Three-Dimensional Finite Element Framework For Investigating Functional Electrical Stimulation Protocols", presented at the Epsm Abec 2008, 16.-20.12.2008, Christchurch, New Zealand.

[124] **Röhrle, O.**, Davidson, J., Kim, J., Pullan, A., (2007). "Bridging Scales: An Attempt to Incorporate Cellular Responses Within a Three-Dimensional FEM Model of Active Muscle Contraction", presented at the World Congress on Bioengineering 2007, 9.-11.6.2007, Bangkok, Thailand.

[125] **Röhrle, O.**, Davidson, J., Pullan, A., (2007), presented at the A Multi-Scale Finite Element Approach for Modelling Electro-mechanical Coupling Within Skeletal Muscles during contraction", 28.-30.11.2007, Cachan, France.

[126] **Röhrle, O.**, Pullan, A., (2007). "From Jaw Tracking to Biomechanical Modelling of the Human Masticatory System", presented at the Proceedings of the 6th Biennial Australian and New Zealand Society of Biomechanics ABC 2007, 15.-17.2.2007, Auckland, New Zealand.

[127] Pap, S., Xu, P., Bronland, J., **Röhrle, O.**, Pullan, A., (2006). "Designing a Robot Based on Parallel Mechanism to Reproduce Human Chewing Behaviour", presented at the ISR 2006 - ROBOTIK 2006: Proceedings of the Joint Conference on Robotics (VDI-Berichte Nr. 1956), 15.-17.5.2006, Munich, Germany.

[128] **Röhrle, O.**, Davidson, J., Pullan, A., (2006). "Finite Element Modelling of Human Mastication", presented at the Journal of Biomechanics, 29.7.-4.8.2006, Munich (Germany).

[129] **Röhrle, O.**, Pullan, A., (2006). "Mathematically Modeling the Effects of Electrically Stimulating Skeletal Muscle", presented at the Proceedings of the 28th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 30.8.-3.9.2006, New York, NY (USA).

[130] **Röhrle, O.**, Pullan, A., (2006). "Modelling Micro-structures Within Relatively Large Cubic Hermite Finite Elements", presented at the Proceedings of the 3rd European Conference on Computational Mechanics Solid, 4.-8.6.2006, Lisbon, Portugal.

[131] **Röhrle, O.**, Anderson, I., A.J. P., (2005). "Modeling Jaw and Teeth Mechanics", presented at the Twelve Copper Mountain Conference on Multigrid Methods, 3.-8.4.2005, Copper Mountain, Colorado (USA).

[132] **Röhrle, O.**, Anderson, I., Pullan, A., (2005). "From Jaw Tracking Towards Dynamic Computer Models of Human Mastication", presented at the IFBME Proceedings of

12th International Conference on Biomedical Engineering, 7.-10.12.2005, Singapore, Singapore.

[133] Manteuffel, T., McCormick, S., **Röhrle, O.,** (2004). "A Projection Multilevel Method for Quasilinear Elliptic Partial Differential Equations", presented at the Eighth Copper Mountain Conference on Iterative Methods, 28.3.-2.4.2004, Copper Mountain, Colorado (USA).

[134] Manteuffel, T., McCormick, S., **Röhrle, O.,** (2004). "Multilevel Techniques for Quasilinear Partial Differential Equations", presented at the International Congress on Computational and Applied Mathematics (ICCAM2004), 7.-10.7.2004, Leuven, Belgium.

Plenary, Keynote and Invited Lectures at Conferences:

1. **Keynote Speaker** (45 min), *"Using Continuum Biomechanics to Model the Musculoskeletal System"* at the International Society of Biomechanics (ISB), TCGS 2021, online, 21.–23.07.2021 (invited by Conference Organizers).

2. **Invited Speaker** (30 min), *"The Theory of Porous Media in Modelling Biological Tissues"* at the InterPore 2021, online, 31.05.–04.06.2021 (invited by Conference Organizers).

3. **Invited Speaker** (60 min), *"Continuum-mechanical Modelling of the Musculoskeletal System"* at the American University of Beirut Biomedical Engineering Winter School (postponed due to COVID19 pandemic), Beirut, Lebanon (invited by Dr. J. Amatoury, Chairman of the winter school).

4. **Plenary** (45 min), *"Continuum-mechanical Modelling of the Musculoskeletal System"* at the Computational Biomedicine Conference, London, UK, 25.–27.09.2019 (invited by Prof. P. Coveney).

5. **Invited Speaker** (45 min), *"Three-Dimensional Continuum-Mechanical Modelling of the Musculoskeletal System"* at the Maths from the Body II, Venice, Italy, 06.–08.06.2018 (invited by Dr. G. Giantesio).

6. **Invited Speaker** (20 min), *"Computational Challenges in Multi-scale Modelling of the Neuromuscular System"* at the 8th World Congress of Biomechanics, Dublin, Ireland, 08.–12.07.2018 (invited by Prof. A. G. Hoekstra).

7. **Plenary** (60 min), *"Multi-scale modelling of the neuromuscular system"* at the SoftMech Workshop, Sheffield, UK, 18.–20.06.2018 (invited by Dr. P. Watton).

8. **Plenary** (30 min), *"Three-Dimensional Continuum-Mechanical Modelling of the Musculoskeletal System"* at the International Conference on Biomedical Technology 2017 (ICBT 2017), Hannover, Germany, 06.–11.11.2017 (invited by Prof. P. Wriggers).

9. **Invited Speaker** (60 min), *"Occlusal loading conditions during mastication from an experimental and simulation point of view"* at the ADM (Academy of Dental Materials) Annual Meeting, Nürnberg, Germany, 05.–07.10.2017 (invited by Prof. Dr. U. Lohbauer).

10. **Plenary** (60 min), *"The virtual skeletal muscle – from the cell to the system"* at the Seventh International Conference on Computational Bioengineering (ICCB2017), Compiege, France, 06.–08.09.2017 (invited by Prof. M.-C. Ho Ba Tho).

11. **New Zealand Science Circle Talk** (60 min), *"An Engineering Approach to Understand the Human Body: Collaborative Auckland-Stuttgart Research Initiatives in Bioengineering"* at the jointly with Prof. L. Cheng, New Zealand Science Circle Talk II, Stuttgart, Germany, 30.03.2017 (invited by Ambassador of New Zealand, Sir Rodney Harris).

12. **New Zealand Science Circle Talk** (60 min), *"An Engineering Approach to Understand the Human Body: Collaborative Auckland-Stuttgart Research Initiatives in Bioengineering"* at the jointly with Prof. L. Cheng, New Zealand Science Circle Talk I, Berlin, Germany, 27.03.2017 (invited by Ambassador of New Zealand, Sir Rodney Harris).

13. **Invited Speaker** (30 min), *"The virtual skeletal muscle: A multi-physics and multi-scale challenge"* at the Virtual Physiological Human (VPH) Conference, Amsterdam, The Netherlands, 01.–28.09.2016 (invited by VPH Conference organizers).

14. **Plenary** (90 min), *"Modelling of skeletal muscles"* at the ViVaCE Computational Mechanics Workshop, Stuttgart, Germany, 18.–20.05.2016 (invited by V. Krupennikova).

15. **Keynote jointly with Jun.-Prof. Syn Schmitt (45min)** (45 min), *"Human Factors in Cyber-Physical Systems"* at the interdisciplinary conference with the topic "Technische Unterstutzungssysteme, die die Menschen wirklich wollen", Helmut-Schmidt-Universitat Hamburg, Hamburg, Germany, 14.–15.12.2014 (invited by Prof. J. Wulfsberg).

16. **Keynote** (45 min), *"Biophysical Simulations of Motor Unit Recruitment in Skeletal Muscles"* at the Russian-Dutch-EU workshop on Computational Biomedicine, from molecule to man, Amsterdam, The Netherlands, 01.–17.10.2014 (invited by Prof. A. G. Hoekstra).

17. **Plenary** (45 min), *"Modelling Skeletal Muscles: A multi-physics challenge"* at the Workshop MSO-Tools 2014 – Modelling, Simulation and optimization of multi-physics Systems, Berlin, Germany, 29.–30.09.2014 (invited by Prof. V. Mehrmann).

18. **Invited Talk** (45 min), *"Biophysical Simulations of Motor Unit Recruitment in Skeletal Muscles"* at the Translational Engineering for Neurorehabilitation DEMOVE-Meeting, Göttingen, Germany, 22.–23.10.2013.

19. **Keynote** (45 min), *"The Virtual Skeletal Muscle"* at the 18th International Symposium on Computational Biomechanics, Ulm, Germany, 13.05.2013.

20. **Invited Talk** (30 min), *""Design and Simulation""* at the OrthoTec Europe, Zürich, Switzerland, 13.09.2012.

21. **Plenary** (50 min), *"The Virtual Skeletal Muscle - A Multi-Scale and Multi-Physics Challenge"* at the 82nd Annual Meeting of the GAMM (Gesellschaft fur Angewandte Mathematik und Mechanik), Graz, Switzerland, 20.04.2011.

22. **Plenary** (50 min), *"Computational advances in Skeletal Muscle Modelling with Applications to Functional Electrical Stimulation"* at the 1st International HPRC (Human-Oriented Product Innovation Research Center) Workshop, Korea University, Seoul, Korea, 10.10.2008 (invited by Prof. J. Hong).

23. **Main Lecture** (40 min), *"Skeletal Muscle Mechanics"* at the in the Section Muscle and Bone GAMM 2007, Zürich, Switzerland, 01.–20.07.2007.

24. **Plenary** (60 min), *"Jaw and Teeth Mechanics"* at the Annual conference of the New Zealand Institute of Dental Technicians, Wellington, New Zealand, 14.10.2006 (invited by Dr. J. Aarts).

25. **Keynote** (45 min), *"Jaw and Teeth Mechanics"* at the (jointly with A/Prof A.J. Pullan) Craniofacial Biomechanics Symposium of the 45th Annual Meeting of the Australian/New Zealand Division of the International Association for Dental Research, Queenstown, New Zealand, 25.–28.09.2005 (invited by Prof. J. Kieser).

Colloquium Presentations (selected):

1. Invited colloquium presentation at the **INSEGNIO, University of Sheffield**, Sheffield, UK on 31.01.2019 (invitation by Prof. C. Mazza).

2. Invited colloquium presentation at the **AO Research Institute Davos**, Davos, Switzerland on 13.08.2018 (invitation by Prof. B. Gueorguiev-Rüegg).

3. Invited colloquium presentation at the **Institut für Mechanik, Fachbereich Maschinenbau, Universität Kassel**, Kassel, Germany on 30.11.2017 (invitation by Prof. A. Ricoeur).

4. Invited colloquium presentation at the **Civil & Environmental Engineering Department, Stanford University**, Palo Alto, CA, USA on June, 2017 (invitation by Prof. C. Lindner).

5. Invited colloquium presentation at the **Seminar Numerische Mathematik und Mechanik, University Duisburg-Essen**, Essen, Germany on 13.01.2017 (invitation by Prof. J. Schröder, Prof. A. Klawonn).

6. Invited colloquium presentation, **Yonsei University**, Seoul, Korea on 18.07.2016 (invitation by Prof. E. Lee).

7. Invited colloquium presentation, **Monash University**, Melbourne, Australia on 24.02.2016 (invitation by Prof. H. de Sterck).

8. Invited colloquium presentation at the **Mechanical Engineering Department, University of Melbourne**, Melbourne, Australia on 23.02.2016 (invitation by Prof. P.V.S. Lee).

9. Presentation, **to the right honourable David Carter, MP (New Zealand) German-New Zealand research initiatives**, Munich, Germany on 20.04.2015.

10. Presentation at the **Symposium "Innovationen in der Medizintechnik", Hochschule Reutlingen**, Reutlingen, Germany on 20.05.2014 (invitation by Prof. G. Lorenz).

11. Invited colloquium presentation at the **Materials Modelling Colloqium Institute for Materials Testing, Materials Science and Strength of Materials (IMWF), University of Stuttgart**, Stuttgart, Germany on 09.12.2013 (invitation by Prof. S. Schmauder).

12. Invited colloquium presentation at the **Dynamore-Infotag Menschmodelle, Dynamore**, Stuttgart, Germany on 08.03.2013 (invitation by Dr. N. Karajan).

13. Invited colloquium presentation at the **Auckland Bioengineering Institute, The University of Auckland**, Auckland, New Zealand on 19.02.2013 (invitation by Prof. P. Hunter).

14. Invited colloquium presentation at the **Institut für Sport- und Bewegungswissenschaft, University of Stuttgart**, Stuttgart, Germany on 11.12.2012 (invitation by JP S. Schmitt).

15. Invited colloquium presentation at the **Department of Physiology, Northwestern University**, Chicago, USA on 05.10.2012 (invitation by Prof. CJ Heckman).

16. Invited colloquium presentation at the **Medtronic Inc., Strategy and Scientific Operations**, Minneapolis, MN, USA on 01.10.2012 (invitation by Dr. M. Reiterer).

17. Invited colloquium presentation**, University of Wisconsin**, Milwaukee, USA on 28.09.2012 (invitation by Prof. B. Wade).

18. Invited colloquium presentation at the **Institut für Sportwissenschaft, University of Darmstadt**, Germany on 29.08.2012 (invitation by Prof. A Seyfarth).

19. Invited colloquium presentation at the **Department of Biomedical Engineering King's College**, London, UK (invitation by Prof. N. Smith).

20. Invited colloquium presentation at the **Insitute for Systems Theory and Automatic Control, University of Stuttgart**, Stuttgart, Germany on 27.03.2012 (invitation by Prof. F. Allgöwer).

21. Invited colloquium presentation at the **Department of Integrative Physiology, University of Colorado Boulder**, Boulder, CO, USA on 21.02.2011 (invitation by Prof. R. Enoka).

22. Invited talk at the **mini-symposium on Bioengineering Inselspital, Universitätsklinikum Bern**, Bern, Switzerland on 14.10.2010 (invitation by Prof. K. Siebenrock, Prof. L.P. Nolte).

23. Invited colloquium presentation at the **Medical Engineering Research Theme, Queensland University of Technology (QUT)**, Brisbane, Australia on 29.07.2010 (invitation by Prof. C. Adams, Prof. M. Pearcy).

24. Invited colloquium presentation at the **Faculty of Mechanical Engineering, Technical University of Munich**, Munich, Germany on 29.07.2010 (invitation by Prof. W. Wall).

25. Invited colloquium presentation**, University of Duisburg-Essen**, Essen, Germany on 09.06.2010 (invitation by Prof. J. Schröder, Jun.-Prof. T. Ricken).

26. Invited colloquium presentation**, RWTH Aachen**, Aachen, Germany on 19.11.2009 (invitation by Prof. M. Itskov).

27. Invited colloquium presentation at the **for Systems Biology, CBS, University of Stuttgart**, Stuttgart, Germany on 17.07.2009 (invitation by Jun.-Prof. N. Radde).

28. Invited colloquium presentation**, University of Applied Science Remagen**, Remagen, Germany on 23.04.2009 (invitation by Prof. J.G. Schmidt).

29. Invited colloquium presentation**, Tufts University**, Boston, MA, USA on 23.01.2009 (invitation by A/ Prof. S. McLachlan).

30. Invited talk at the **JP-Tagung of Excellence Cluster Simulation Technology, University of Stuttgart**, Stuttgart, Germany on 20.05.2008 (invitation by Prof. W. Ehlers).

31. Invited colloquium presentation**, University of Erlangen-Nürnberg**, Erlangen, Germany on 27.05.2008 (invitation by Prof. U. Rüde).

32. Invited colloquium presentation at the **Institute of Solid Mechanics, Technical University Braunschweig**, Braunschweig, Germany on 19.12.2007 (invitation by Prof. S. Reese, Jun.-Prof. M. Böl).

33. Invited colloquium presentation at the **Mathematics Department, Universit'e f de Fribourg**, Fribourg, Switzerland on 11.12.2007 (invitation by Prof. D. Ruegg).

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📱 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · 🎓 Google Scholar Profile · 🐦 OR71o

34. Invited presentation at the **research colloquium C&C Laboratories, NEC Europe LTd. On Mathematically modelling skeletal muscle**, St. Augustin, Germany on 03.07.2006 (invitation by Dr. Schmidt).

35. Invited talk at the **on Multilevel Techniques for Quasilinear Partial Differential Equations, Sandia National Laboratories**, Albuquerque, USA on 18.03.2004 (invitation by Dr. R. Tuminaro).

36. Invited talk at the **Eine Mehrgitter-Projektions-Methode für quasilineare Systeme erster Ordnung, University of Ulm**, Ulm, Germany on 09.01.2004 (invitation by Prof. W. Forst, Prof. K. Urban).

Collaborations (Selection)

National Collaborations – Excluding University of Stuttgart

1. **Betz, O.** (Institute of Evolution and Ecology, University of Tubingen)
2. **Dietrich, A.** (Hochschule Furtwangen, Fakultät Gesundheit, Sicherheit und Gesellschaft)
3. **Giese, M.** (Werner Reichardt Centre for Integrative Neuroscience (CIN) / Hertie Institute for Clinical Brain Research, University of Tübingen)
4. **Kohl, P.** (Universitäts-Herzzentrum, University of Freiburg)
5. **Kupczik, K.** (Max-Planck Weizmann Center for Integrative Archaeology and Anthropology and Max-Planck Institute for Evolutionary Anthropology, Leipzig, Germany)
6. **Marquetand, J.** (Neurology, Universitätsklinikum Tübingen)
7. **Reski, R.** (Institute of Biology II, Chair Plant Biotechnology, University of Freiburg)
8. **Schneider, U.** (Fraunhofer-Institut fur Produktionstechnik und Automatisierung (IPA), Abteilung "Orthopädie und Bewegungssysteme", Stuttgart)
9. **Schwan, S.** (Fraunhofer Fraunhofer-Institut für Werkstoffmechanik IWM, Halle)
10. **Speck, O.** (Plant Biomechanics Group Freiburg, University of Freiburg)

International Collaborations

1. **Ackland, D., Lee P.** (University of Melbourne)
2. **Bilston, L.** (Neuroscience Research Australia, UNSW Medicine)
3. **Broser, P.** (Paediatric Neurology, Ostschweizer Kinderspital, Switzerland)
4. **Dorfman, L., Adler, J.** (Tufts University, Medford, MA, USA)
5. **Falgout, R., Schroder, J.** (Lawrence Livermore National Lab (LLNL), USA)
6. **Farina, D.** (Imperial College London, UK)
7. **Gong, L.** (Tongji University, China)
8. **Grönlund, C.** (Umea universitet, Sweden)
9. **Gueorguiev, B., Windolf, M.** (AO Foundation, Davos, Switzerland)
10. **Hunter, P., Nash, M., Cheng, L., Xu, P., and further** (Auckland Bioengineering Institute, University of Auckland, New Zealand)
11. **Jeneson, J.** (University of Groningen, Groningen, the Netherlands)
12. **Lloyd, D.** (Musculoskeletal Research Program, Griffith Health Institute, Australia)

13. **MacLachlan, S.** (Memorial University of Newfoundland, St. John's, Canada)

14. **Nordsletten, D.** (Department of Biomedical Engineering, King's College London)

15. **Pivonka, P:** (Queensland University of technology, Australia)

16. **Ponte Castaneda, P.** (University of Pennsylvania)

17. **van Riel, N.** (Technische Universiteit Eindhoven, the Netherlands)

18. **Wadell, N., Swain, M.** (University of Otago, Dunedin, New Zealand)

Supervised PhD Students

1. **Dirsch, Jana** (2022 – now) working on her research topic "Simulating muscle metabolism bridges the gap between in vivo data and muscle function".

2. **Völter, Jan-Sören** (2021 – now) working on his research topic "Using the Theory of Porous Media for a better understanding of biological materials and processes associated with it".

3. **Ismailova, Shakhnoza** (2020 – now) working on her research topic "Microstructurally Modelling of Skeletal Muscle Mechanics".

4. **Lehmann, Lena** (2019 – now) working on her research topic "Machine learning-based decomposition of the activity of individual motor units from synthetic and experimental data". This is a jointly supervised PhD project with B. Yang, University of Stuttgart.

5. **Rosin, David** (2019 – now) working on his research topic "Pervasive Simulation and Visualization with Resource- and Time-Constraints".

6. **Chuchuy, Johanna** (2018 – now) working on his research topic "Development of a microphysiological system for the investigation of a human retinal tissue (Retina-on-a-Chip)". This is together with P. Loskill, Fraunhofer IGB/University of Tübingen.

7. **Corkill, Ruth** (2018 – now) working on her research topic "Novel Quantum Sensors For Investigating Muscular Activity".

8. **Ramakrishnan, Anantha** (2018 – now) working on his research topic "Finite Element Evaluation of the Effect of Adhesive Creams on the Stress State of Dentures and Oral Mucosa". This is jointly with Fraunhofer IWMS, Halle.

9. **Sahrmann, Annika** (2018 – now) working on her research topic "Robust methods for ultrasound data collection".

10. **Schmid, Laura** (2018 – now) working on her research topic "Modelling feedback within the neuromuscular system".

11. **Schneider, Oliver** (2018 – now) working on his research topic "Generation, probing and biophysical stimulation of human microtissues in microfluidic Organ-on-a-chip platforms". This is together with P. Loskill, Fraunhofer IGB/University of Tübingen.

12. **Trivedi, Zubin** (2018 – now) working on his research topic "Modelling of material injection processes into porous structures applied to vertebroplasty".

13. **Rashan, Animesh** (2017 – now) working on his research topic "Optimal Design of Sockets for Above-Knee Amputees". A. Rashan is a member of the Fraunhofer IPA.

14. **Dr. Saini, Harnoor** (2016 – 2020) with his PhD thesis on "Computational skeletal muscle models for signal identification and sensor development" (defended on 22.04.2021).

15. **Klotz, Thomas** (2016 – now) working on his research topic "Biophysically-based multiscale and multiphysics modelling of the neuromuscular system under healthy and pathological conditions".

16. **Villota Narvaez, Yesisd** (2016 – now) working on his research topic "Multi-scale Modelling Muscle Growth and Remodelling". This PhD shall be part of a double-degree program togethere with the Universidad de Bogota.

17. **Dr. Hessenthaler, Andreas** (2015 – 2019) with his PhD thesis on "Multilevel Convergence Analysis: Parallel-in-Time Integration for Fluid-Structure Interaction Problems with Applications in Cardiac Flow Modelling" (defended on 07.02.2020).

18. **Dr. Ashgarzadeh, Pouyan** (2014 – 2020) with his PhD thesis on "Data-Driven Structural Analysis of Biological Networks Using Artificial Intelligence and Finite-Element Simulations" (defended on 07.05.2020).

19. **Dr. Bleiler, Christian** (2013 – 2021) with his PhD thesis on "Microstructurally-based multiscale modelling of skeletal muscle tissue" (defended on 06.04.2021).

20. **Dr. Mordhorst, Mylena** (2013 – 2020) with her PhD thesis on "Towards a stable and fast dynamic skeletal muscle model" (defended on 16.04.2020).

21. **Altan, Ekin** (2013 – 2021) with her PhD thesis on "Modelling neural adaptation of vastus lateralis in response to isometric knee extension exercise".

22. **Dr. Ramasamy, Ellankavi** (2012 – 2018) with his PhD thesis on "A Modelling-Simulation-Analysis Workflow for Investigating Socket-Stump Interaction" (defended on 12.04.2018). E. Ramasamy was a member of the Fraunhofer IPA.

23. **Morales, Sergio** (2012 – now) working on his research topic "DAAD-Scholar, Finite Element Modelling of the Human Aortic Valve in Healthy and Diseased Conditions".

24. **Dr. Sprenger, Michael** (2009 – 2015) with his PhD thesis on "A 3D Continuum-Mechanical Model for Forward-Dynamics Simulations of the Upper Limb" (defended on 09.10.2015).

25. **Dr. Heidlauf, Thomas** (2009 – 2015) with his PhD thesis on "Modelling the Neuromuscular System" (defended on 28.09.2015).

26. **Dr. Wang, Yikun** (2009 – 2013) with his PhD thesis on "Modelling the movement of the tongue during the oral stage of the swallowing process" (defended on 01.10.2013). Y. Wang defended his thesis under the collaborative supervision with M Nash at the Auckland Bioengineering Institute, University of Auckland, New Zealand.

27. **Dr. Davidson, John** (2006 – 2009) with his PhD thesis on "Biophysical Modelling of Skeletal Muscle" (defended on 01.10.2009). J . Davidson defended his thesis under the collaborative supervision with A. Pullan at the Auckland Bioengineering Institute, University of Auckland, New Zealand.

Teaching Activities

1. **Theoretical and Practical Aspects in Experimental Research** (6 ECTS) will be taught starting winter term 2021 and then offered during winter terms: This lecture will be offered to SimTech students in order to make them aware of challenges during data acquisition and integration. The focus will be on collecting non-invasive human data.

2. **Modellierung und Simulation in der Biomechnik / Modelling and Simulation in Biomechanics** (6 ECTS) was taught from 2014 – now during the summer terms: Lecture and accompanying exercises for Master students in Biomedical Engineering focusing on numerical methods for action potential propagation of skeletal muscle tissue.

3. **Praktische Übungen im Spezialisierungsfach "Biomechanik und Bionik"** (3 ECTS) was taught from 2014 – now during the summer terms: Mandatory practical study exercises for Master students in Biomedical Engineering.

4. **Introduction to Neuromechanics** (3 ECTS) was taught from 2017 – now during the summer terms: Elective for Master students in Biomedical Engineering with a focus on "Biomechanics and Bionics" and Simulation Technology (responsible for the course is Dr. L. Gizzi).

5. **Biomechanik Kolloquium** (3 ECTS) was taught from 2017 – now during each term: Jointly together with Prof. S. Schmitt as a platform for investigating and discussing various different topics in skeletal muscle mechanics and related subject areas.

6. **Continuum Biomechanics** (6 ECTS) was taught from 2010 – now during the winter terms: Lecture and accompanying exercises for Master/Diplom students of the Faculty of Civil Engineering and Environmental Sciences, for COMMAS ("Computational Mechanics of Materials and Structures") students and "Simulation Technology" students.

7. **Einfuhrung in die Kontinuumsbiomechanik / Introduction to Continuum Biomechanics** (6 ECTS) was taught from 2013 – now during the winter terms: Lecture and accompanying exercises for Master students in Biomedical Engineering, Simulation Technology.

8. **Simulation Technology A** (6 ECTS) was taught from 2013 – now during the winter terms: Lecture for Master students in Simulation Technology (jointly with S. Schmitt, N. Radde, and R. Helmig).

9. **Höhere Mechanik II / Numerical Methods for Mechanics** (6 ECTS) was taught from 2010, 2012, 2014, 2016, 2018 during the summer terms: This lecture is part of of the Faculty of Civil Engineering and Environmental Sciences at the University of Stuttgart, Germany.

10. **Technische Mechanik III: Mechanik inkompressibler Fluide / Applied Mechanics III, Mechanics of incompressible Fluids** (6 ECTS) taught in 2011, 2013, 2015, 2017 during the winter terms: This lecture is part of the bachelor curriculum of Environmental Engineering at the University of Stuttgart, Germany.

11. **SimTech Seminar** (3 ECTS) was taught in 2013: Seminar series for SimTech bachelor students in the 4th semester.

12. **Computational Methods in Biomechanics** (6 ECTS) was taught from 2011 – 2013 during the summer terms: Lecture and accompanying exercises for Master/Diplom students of the Faculty of Civil Engineering and Environmental Sciences, for COMMAS ("Computational Mechanics of Materials and Structures") students.

13. **Interdisziplinäre Forschung in der Biomechnik am Beispiel des mechanischen Demonstrators** (3 ECTS) was taught in 2011 during the summer term: SimTech Seminar for Ph.D. students at the University of Stuttgart, Germany.

14. **Coupled Problems and Numerical Solution Strategies** (6 ECTS) was taught in 2009 during the winter term: Lecture and accompanying exercises for Master/Diplom students of the Faculty of Civil Engineering and Environmental Sciences, for COMMAS ("Computational Mechanics of Materials and Structures") students.

✉ roehrle@simtech.uni-stuttgart.de · ◉ http://www.imsb.uni-stuttgart.de · ☎ +49 711 685 66284
ⓘD orcid.org/0000-0002-1934-6525 · ⑧ Google Scholar Profile · 🐦 OR71o

15. **Coupling Dynamics and Systems Biology to Biomechanics** (3 ECTS) was taught in 2009 during the winter term: SimTech Seminar for Ph.D. students at the University of Stuttgart, Germany.

16. **Technische Mechanik IV / Hydro Mechanics** (3 ECTS) was taught in 2009: This lecture is part of the curriculum of the Faculty of Civil Engineering and Environmental Sciences at the University of Stuttgart, Germany.

17. **BioMEng221 – Mechanics of Biomaterials** (6 ECTS) was taught in 2007: BioMEng221 was part of the Bachelor curriculum for "Biomedical Engineering" at the University of Auckland, New Zealand (taught 50% of the course).

18. **EngSci213FC – Mathematical Modelling 2 for Software Engineers** (6 ECTS) was taught in 2006: This lecture is part of the Bachelor curriculum for "Engineering Science" at the University of Auckland, New Zealand (taught 50% of the course).

19. **APPM1350 – Calculus 1 for Engineers** (2 ECTS) was taught in 2001: APPM1350 is part of the Arts and Sciences Bachelor curriculum at the University of Colorado at Boulder, USA (taught 3 times the same course per semester).

20. **APPM2350 – Calculus 3 for Engineers** (2 ECTS) was taught in 2001: APPM2350 is part of the Arts and Sciences Bachelor curriculum at the University of Colorado at Boulder, USA. (taught 3 times the same course per semester).

21. **APPM1360 – Calculus 2 for Engineers** (2 ECTS) was taught in 2000: APPM1360 is part of the Arts and Sciences Bachelor curriculum at the University of Colorado at Boulder, USA (taught 3 times the same course per semester).

22. **MATH105 – Intermediate Algebra** (2 ECTS) was taught in 1998, 1999: MATH105 was part of the Bachelor curriculum at the University of Wisconsin at Milwaukee, USA (taught 3 times the same course per semester).

Contributions to the Research Community and Peer Esteem

Public Relations

- **Girls Day** In the framework of the Girls' Day, 30 girls got an insight into human neuromechanics. The Girl's Day-initiative is a German-wide project, which aims at bringing girls closer to engineering and natural sciences. (22.04.2021).

- **SFB1313** Public Lecture at he Planetarium Stuttgart as part of the SFB1313 lecture series "Pretty Porous - Alles porös" (01.07.2020).

- **TRR 141 Exhibition** As part of the TRR 141 exhibition at the Staatlichen Museum für Naturkunde Stuttgart, Schloss Rosenstein, the research results of A03 and A09 were presented. (19.10.2017– 06.05.2018).

- **8th New Zealand-Germany Science Circle Talk / GRK2198** By invitation of the New Zealand Ambassador to Germany, Rodney Harris, Prof L. Cheng and me were invited to present the 8th New Zealand-Germany Science Circle Talk at Berlin (Hosts: Humboldt-Stiftung (H. Schwarz), BMBF (V. Rieke), DFG (I. Krußmann), NZ Ambassador (R. Harris)) and at Stuttgart" (Hosts: University of Stuttgart (W. Ressel), Ministry (MWK, H.-G. Wolf), NZ Ambassador (R. Harris)). The talks were entitled "An Engineering Approach to Understand the Human Body – Collaborative Auckland-Stuttgart Research Initiatives in Bioengineering". (27.– 30.03.2017).

- **Exhibition of SFB 716 + Cluster of Excellence** The SFB 716 and the Cluster of Excellence exhibited their research to the public within the Stuttgart planetarium (Exhibition "Im Digitalen Labor"). As part of this exhibition, there were also public talks about specific topics, like the joint talk between me and S. Schmitt on "Menschen am Computer simulieren - Wie Simulationen laufen lernen" (21.06.2017).
- **Cover of the journal Interface Focus Volume 5 Issue 2** .

Memberships

- Member of the Society of Industrial and Applied Mathematics (SIAM) including the Computational Science and Engineering (CSE) activity group
- Member of the GAMM (Gesellschaft für Angewandte Mathematik und Mechanik)
- Member of the GACM (The German Association for Computational Mechanics)
- Member of WiR-BaWü (Wissenschaftliches Rechnen Baden-Württemberg)
- Member of EUROMECH
- Former member of the DGfB (Deutsche Gesellschaft für Biomechanik)
- Former member of the Australian and New Zealand Society of Biomechanics
- Member of the Biomouth Research Group

Offices

- Spokesperson of the DFG-Funded Priority Programme SPP2311 – Robustly coupling continuum-biomechanical in silico models to obtain active biological system models for later use in clinical applications – Co-design of modeling, numerics and usability (2021 – now).
- Member and Deputy Chairman of the GRADUS Steering Committee at the University of Stuttgart (2020 – now).
- Member of the Steering Committee of the "School of Talents" at the University of Stuttgart (2020 – now).
- Member of the "Ehrungskommission" of the Faculty of Civil and Environmental Engineering, University of Stuttgart (2020 – now).
- Initiator and Vice-Chairman of the GAMM activity group "Computational Biomechanics" (jointly with Prof. T. Ricken, University of Stuttgart) (2019 – now).
- Member of the Board of the DEKOMECH – Deutsche Komitee fur Mechanik (2018 – now).
- Member of the Strategic Committee Board of the University of Stuttgart to develop the proposal as part of the German Excellence Initiative to become one of Universities of Excellence within Germany (invited by the rector) (2017 – now).
- Member of the Steering Committee of the "Gender Equality and Diversity Pooling Concept"at the University of Stuttgart (2017 – now).
- Deputy Dean, Faculty of Civil and Environmental Engineering (2017 – now).
- Spokesperson GRK 2198/1 (2017 – now).
- Member of the Strategic Planning and Development Committee of the Faculty of Civil and Environmental Engineering (2017 – now).
- Member of the "Examination Committee" for the Bachelor and Master program "Simulation Technology" (2016 – now).

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📞 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · 🎓 Google Scholar Profile · 🐦 OR71o

- GAMM representative for the University of Stuttgart (2014 – now).
- Contact person of the Universitat Stuttgart to the Virtual Physiological Human (VPH) Institute (2014 – now).
- Initiator and (vice) chairman of the GAMM activity group "Computational Science and Engineering" /jointly with Prof. Rüde, U. of Erlangen and Prof. B. Wohlmuth, Technische Universität München (2010 – 2019).
- Secretary and Co-founder of the Biomouth Research Group (2007 – 2008).
- Co-founder and co-president of the University of Colorado at Boulder Graduate Chapter of SIAM (2002 – 2003).
- President of the oldest student organisation (Cosmopolitan Club) at the University of Colorado at Boulder, USA (2001 – 2003).
- GAMM representative to the ECCOMAS's European Young Investigators Committee .

Editorial Tasks

- Guest Editor of the Special Issue on "The Virtual Physiological Human – from Computational Biomedicine to Clinical Applications" for the Journal of Computational Science
- GAMM-Mitteilungen, Band 32, Heft 2, 2009: "Biomechanics" (jointly with Prof. W. Ehlers and Dr. B. Markert)
- Review Editor for "Frontiers in Computational Physiology and Medicine"
- Editor of the quarterly Biomouth Newsletters

Software

- Core developer and programmer of the software tools OpenCMISS and CMISS. OpenCMISS is an open-source redevelopment of the software tool CMISS (Continuum Mechanics, Image analysis, Signal processing and System Identification), which is designed to run efficiently on distributed memory machines. OpenCMISS is a joint programming effort of multiple biomedical research groups world-wide.
- Contributor to the OpenDiHu Code design and development. OpenDiHu is a highly parallel Code developed as part of the "Digital Human" project funded under the HPCII-Call of the Baden-Württemberg Stiftung

Reviewer

- Reviewer for proposals submitted to the DFG (GRKs, SFBs, FOR, Sachbeihilfe)
- Member of the Review Panel for the NIAMS/NIH call on "Musculoskeletal Biology and Medicine Resource-based Centers (P30)"
- Member of the Review Panel for the NIH/NIBIB inter-agency special initiative "Predictive Multiscale Models for Biomedical, Biological, Behavioral, Environmental and Clinical Research (U01)".
- Reviewer for EPSRC, United Kingdom
- French National Research Agency
- Reviewer for proposals submitted to the Royal Society of New Zealand
- Reviewer for proposals submitted to the German-Israeli Foundation for Scientific Research and Development (GIF)

- Reviewer for proposals submitted to the Osterreichische Austauschdienst
- Member of the selection committee for "Studienstiftung des deutschen Volkes"
- Reviewer Editor for Frontiers in Computational Physiology and Medicine
- Reviewer Editor for Frontiers in Biomechanics
- Guest Associate Editor for Frontiers in Bionics and Biomimetics
- External examiner of a Habilitation
- External examiner of Ph.D. theses (Australia, New Zealand, Singapore, South Africa, etc.) and Master theses.
- Reviewer for the following journals: Advances in Computational Mathematics – Annals of Biomedical Engineering – Archive of Applied Mechanics – Archives of Oral Biology – Biomechanics and Modeling in Mechanobiology – Biophysical Journal – Cellular and Molecular Bioengineering – Clinical Biomechanics – Computational Materials Science – Computer Methods and Programs in Biomedicine – Computer Methods in Applied Mechanics and Engineering – Computers in Biology and Medicine – Frontiers in Computational Physiology and Medicine – Frontiers in Human Neuroscience – Frontiers in Neuroscience – IEEE Transaction on Medical Imaging – International Journal for Numerical Methods in Biomedical Engineering – International Journal of Molecular Sciences – Journal of Biomechanical Engineering – Journal of Computational Science – Journal of Elasticity – Journal of the Mechanical Behavior of Biomedical Materials – Journal of the Mechanics and Physics of Solids – Journal of Theoretical Biology – Mechanics of Materials – Mechanics Research Communications – Medical & Biological Engineering & Computing – SIAM Journal on Numerical Analysis – SIAM Journal on Scientific Computing – Zeitschrift für Angewandte Mathematik und Mechanik (ZAMM)

Organisation of Scientific Activities (Major Ones)

- Organizer and Chairman of the Virtual Physiological Human at Stuttgart, Germany (04.–06.09.2024).
- Chairman of the Musculoskeletal System Symposium at Stuttgart, Germany (02.–03.09.2024).
- Chairman of the SPP2311 - Annual Meeting at Stuttgart, Germany (23.–24.05.2022).
- Scientific Committee Member of the International Conference on Computational Biomechanics at Lissabon, Portugal (11.–13.04.2022).
- Organizer and Chairman of the Musculoskeletal System Symposium eith confirmed keynote speakers Bilston, Lynne, Blemker, Silvia, Ehlers, Wolfgang, Enoka, Roger, Friden, Jan, Geyer, Hartmut, Gollhofer, Albert, Heckman, CJ, Hunter, Peter, Lieber, Richard, Lloyd, David, Pivonka, Peter, Taylor, Wiliam, Viceconti, Marco, Willie, Bettin at Stuttgart, Germany (2021, postponed to 2024).
- Initiator of the Workshop on "Biological Active Porous Materials:Modelling, Simulation and Experimentation"(jointly together with Luis Dorfman (Tufts), James Adler (Tufts University), Scott MacLachlan (Memorial University of Newfoundland), and Filiz Ates (Mayo Clinic)) at Banff International Research Station (BIRS) at Banff, Canada (2020, postponed to 2022).
- Member of the Scientific Committee of the VPH2020 at Paris, France (2020).
- Scientific Committee Member of the Advanced International School on "Imaging, Modelling and Simulation in Biomechanics and Mechanobiology", at Rome, Italy (2020).
- Organizer of the Summer School for "Soft Tissue Robotics" at Stuttgart, Germany (18.06.2018– 06.07.2018).

- Organizer of the Workshop on "Developing a subject-specific tri-dimensional model of human muscles, from experimental anatomical and physiological data" at the ISEK at Dublin, Ireland (30.06.2018– 02.07.2018).
- Member of the Scientific Advisory Board of the XXI Congress of the International Society of Electrophysiology and Kinesiology 2 at Chicago, USA (2016).
- Member of the Scientific Committee of the International Conference on Biodental Engineering at Lisboa, Portugal (2016).
- Organisation of the Section "S2 Biomechanics" at the 87th Annual Meeting of the GAMM and DMV at Braunschweig, Germany (2016).
- Organizer of the GAMM Workshop of the GAMM Activity Group CSE, University of Kassel, at Germany (06.– 08.09.2016).
- Organisation of the Section "S2 Biomechanics" at the 85th Annual Meeting of the GAMM at Erlangen, Germany (2014).
- Organisation of the Section "S2 Biomechanics" at the 84th Annual Meeting of the GAMM at Novi Sad, Serbien (2013).
- Organizer of the "Advanced OpenSim Workshop and MuscleUp Symposium" at Gold Coast, Queensland, Australia, (11.– 15.02.2013).
- Organisation of the Section "S2 Biomechanics" at the 83rd Annual Meeting of the GAMM at Darmstadt, Germany (2012).
- Organizer of the kick-off meeting for the GAMM activity group "Computational Science and Engineering" at Munich, Germany (17.– 18.09.2012).
- Co-Organiser of the 2. Workshop "Junger Nachwuchswissenschaftler in der Mechanik - mit Schwerpunkt Biomechanik" at Engelberg, Switzerland (14.– 16.02.2011).
- Organiser of the 2nd Biomouth Symposium at Rotorua, New Zealand (23.– 24.06.2008).

✉ roehrle@simtech.uni-stuttgart.de · 🌐 http://www.imsb.uni-stuttgart.de · 📞 +49 711 685 66284
🆔 orcid.org/0000-0002-1934-6525 · 🔍 Google Scholar Profile · 🐦 OR71o