Axel Loewe’s Publications

1 Peer-reviewed Journal Articles

Forthcoming


2022


1 Equal contributions by several authors are denoted by *.


2021


2019


2018


2017


2016


2014


## 2 Data & Software


## 3 Proceedings


2021


2020


4 Abstracts


[a86] Krauß, J., Gerach, T., and **Loewe, A.** “Effects of Ventricular Myofiber Orientation on Mechanical Function in Human Heart Simulations”. In: *Biomedizinische Technik / Biomedical Engineering.* BMT 2022 - 56rd Annual Conference of the German Society for Biomedical Engineering (VDE|DGBMT) 2022. accepted.


[a83] Brenneisen, J., Dössel, O., and **Loewe, A.** “Influence of pressure boundary condition definition on flow patterns in cardiac simulations”. In: *iHEART Congress – Modelling the Cardiac Function.* 2022.


[a76] Sánchez, J., Almeida, T. P., Soriano, D. C., Ng, G. A., Trénor, B., Saiz, J., Luik, A., Dössel, O., and **Loewe, A.** “Directed Graph Information Flow Mapping for Characterizing Cardiac Electrical...


in AF and effects of targeted focal ablation of the critical substrate in-silico”. In: *Biomedizinische Technik / Biomedical Engineering*. BMT 2020 - 54th Annual Conference of the German Society for Biomedical Engineering (VDE|DGBMT) 2020. DOI: 10.1515/bmt-2020-6044.


2019


2018


[a16] Loewe, A., Debatin, S., Lenis, G., and Dössel, O. “Optimal ECG lead systems to maximimze left atrial information content”. In: Biomedizinische Technik / Biomedical Engineering. Vol. 65.
5 Invited Talks

2022 [t12] Loewe, A. “Computermodellierung und maschinelles Lernen in der kardiovaskulären Medizin”.

5 Invited Talks


Loewe, A. “Computational Cardiac Modeling - Synergies with Machine Learning”. In: Cardiac Electromechanics Research Group (Prof. Niederer / Bishop), King’s College London 2021. London, UK.

Loewe, A. “Predicting potential AFLut patterns using computational modeling”. In: Atrial Signals Workshop 2021. Karlsruhe, Germany.


Loewe, A. “The inverse problem of cardiac mechanics - estimation of cardiac active stress from endocardial motion tracking”. In: 6th International Conference on Computational and Mathematical Biomedical Engineering 2019. Sendai City, Japan.

Loewe, A. “Multiscale modeling of cardiac electrophysiology”. In: School of Science and Engineering, Reykjavik University / Háskólinn í Reykjavík 2017. Reykjavik, Iceland.

Loewe, A. “Validation upside down - In-silico models to sound the potential and limitations of diagnostic tools”. In: TRM Forum 2017. Lugano, Switzerland.

Loewe, A. “Multiscale computational cardiology”. In: Computational Physiopathology Unit (Prof. Stefano Severi), University of Bologna 2016. Bologna, Italy.

Loewe, A. “In-silico Assessment of the Dynamic Effects of Amiodarone and Dronedarone on Human Atrial Patho-Electrophysiology”. In: Emerging Mathematical Topics in Biology and Life Sciences 2015. Graz, Austria.


Loewe, A. “Multiscale in silico modeling of human atrial electrophysiology”. In: Computational Cardiology Lab (Prof. Natalia Trayanova), Johns Hopkins University 2014. Baltimore, USA.

6 Patents


7 Public Outreach / Popular Science

KIT im Rathaus. “Mein digitaler Zwilling: Welche Möglichkeiten eröffnen mathematische Computermodelle des Herzens für die Diagnose und Therapie von Herzkrankheiten?” YouTube 2022. URL: https://www.youtube.com/watch?v=iLL1XTmFFMc&list=PL0TmH52ybfIjfnLU0b1TKz8qFCuEJyRNJk&index=3.

[09] Renal Research Institute, Frontiers in Kidney Medicine and Biology. “What ECG can tell us about the events on a molecular scale”. YouTube 2022. URL: https://www.youtube.com/watch?v=g75nZ0wISMI.

2021


Fakultät für Elektrotechnik und Informationstechnik, “Studieren am KIT: Elektrotechnik und Informationstechnik (ETIT)”. YouTube 2021. URL: https://www.youtube.com/watch?v=m7q0o1KqVcE.

2020


See CV for further dissemination and outreach activities.

8 Book Chapters and Monographs

Forthcoming


2022

2021
[04] Loewe, A. “Simulation of Cardiac Electrophysiology and Biomechanics: from Model Development to Clinical Translation”. Habilitation Thesis. Karlsruhe Institute of Technology (KIT).

2016

2013

2010
[01] Loewe, A. “Comparison of cardiac simulation tools regarding the modeling of acute ischemia”. Bachelor Thesis. Karlsruhe Institute of Technology (KIT).
9 Reviewer Activity

9.1 Funding Agencies

- Belgian Physical Society
- British Heart Foundation
- Czech Academy of Sciences, member of evaluation panel “Engineering and Technology”
- Deutsche Forschungsgemeinschaft
- Dutch Heart Foundation
- Dutch Research Council (NWO)
- Fondazione Leonardo
- Medical Research Council, United Kingdom
- Swiss National Science Foundation
- Wellcome Trust

9.2 Scientific Journals

- Annals of Biomedical Engineering (2019-20)
- Biomechanics and Modeling in Mechanobiology (2020)
- Biophysical Journal (2019)
- BMC Nephrology (2021)
- Cardiology Research and Practice (2021)
- Cardiovascular Engineering and Technology (2021)
- Cardiovascular Research (2018, 2022)
- Circulation: Arrhythmia and Electrophysiology (2021)
- Clinical Medicine Insights Cardiology (2019)
- Computers in Biology and Medicine (2018-21)
- Computing in Cardiology Conference (2017-21)
- eLIFE (2021)
- Engineering with Computers (2022)
- Europace (2016-21)
- European Heart Journal (2022)
- Frontiers in Cardiovascular Medicine (2020, 2022)
- Heart Rhythm (2017-19)
- IEEE Transactions on Biomedical Engineering (2016, 2019-21)
- IEEE Transactions on Medical Imaging (2022)
- International Journal of Clinical Cardiology (2017)
- JACC Clinical Electrophysiology (2021-22)
- Journal of Cardiovascular Electrophysiology (2021)
- Journal of Computational Physics (2021)
- Journal of Open Source Software (2021)
- Mathematics (2022)
• Medical and Biological Engineering and Computing (2016-17, 2019)
• Medical Image Analysis (2020-21)
• Platform for Advanced Scientific Computing (PASC) Conference (2021)
• Philosophical Transactions of the Royal Society A (2019-20)
• Physiological Reports (2022)
• PLOS Computational Biology (2017, 2019)
• PLOS ONE (2019)
• Simulation: Transactions of the Society for Modeling and Simulation (2018)
• Wellcome Open Research (2022)

9.3 Universities

• Ghent University (2021)
• KIT Department of Mathematics (2022)
• KIT Department of Electrical Engineering and Information Technology (2020-2022)
• Politecnico di Milano (2021)
• Università degli Studi di Milano (2022)
Axel Loewe’s Supervisions

10 Supervised PhD Students


• Brenneisen, J., expected 2022
• Nagel, C., expected 2023
• Barrios Espinosa, C.A., expected 2024
• Martínez Díaz, L.P., expected 2024
• Martínez Antón, C., expected 2024
• Krauß, J., expected 2025
• Steyer, J.F., expected 2025

11 Supervised and Refereed Student Theses


11 Supervised and Refereed Student Theses


