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Research Interests

My research connects machine learning methodology with real-world applicability; a recurring theme is supporting organisations in their digital transformation.

- **Applied AI** (LLMs · industrial AI · robotics · AI for SMEs): Bringing machine learning into practice where standard approaches fall short, for example with limited data, ill-posed problems, or required domain knowledge; methods range from physics-informed neural networks and patch-based regression to one-shot identification. Current work includes locally hosted LLMs for data sovereignty and AI-driven process optimisation in manufacturing.
- **Green AI** (continual learning · resource-efficient models): Models that learn new tasks without retraining from scratch, reducing computational cost, energy footprint, and the need to retain old training data. Our methods include sparse network expansion (SECL/eSECL), additive neural ensembles (MANN, GB-KAN), and tree-structured architectures.
- **Responsible and Trustworthy AI** (interpretability by design · EU AI Act): Architectures whose explainability is built in rather than added afterwards, such as capsule networks, additive ensembles, and Kolmogorov-Arnold networks, evaluated against the transparency expectations of the EU AI Act.
- **Educational Data Mining and Learning Analytics** (student success · gamification · learning design): Data-driven approaches to improve higher-education outcomes, from dropout-risk prediction and success factors in e-learning to gamified mathematics environments, with a focus on models that remain explainable and actionable for counsellors and teachers.

Academic Career

Since 2022	Vice President for Research, Digitalisation and Internationalisation, Bochum University of Applied Sciences
Since 2010	Professor of Applied Computer Science , Bochum University of Applied Sciences (professorship profile)
2010 – 2015, 2019 – 2022	Vice Dean of the Department of Electrical Engineering and Computer Science; 2010–2015 also Deputy Campus Director, responsible for establishing the new Heiligenhaus campus; 2019–2022 responsible for academic programmes and personnel
Aug. 2019	International Visiting Researcher , Victoria University of Wellington , School of Mathematics and Statistics (collaboration with Prof. Stephen Marsland)
Jan./Feb. 2017	International Visiting Researcher , Massey University , School of Engineering and Advanced Technology (collaboration with Prof. Stephen Marsland)

2008 – 2009	Lecturer for Simulation Technology, South Westphalia University of Applied Sciences
2006 – 2010	Technical Expert and Project Coordinator , dSPACE GmbH , Paderborn; real-time simulation and physical modelling for hardware-in-the-loop systems, including model analysis, code generation, parallelisation and machine learning
2005	Dr. rer. nat. in Numerical Mathematics (computational fluid dynamics, finite element methods), University of Duisburg-Essen

Academic Distinctions

2022	Best Paper Award for “Group and Exclusive Sparse Regularization-based Continual Learning of CNNs”, Canadian Conference on Artificial Intelligence; see Publications for details
2019	Best Paper Award for “A Learning Approach for Ill-Posed Optimisation Problems” (with Stephen Marsland), Australasian Data Mining Conference; see Publications for details

Research Grants and Funding

Total public secured funding: €3,884,306.07 since 2012. *The icons next to the projects indicate the United Nations Sustainable Development Goals (SDGs) addressed by each project.*

July 2024 – July 2027: JetsKI: Applying artificial intelligence to optimise waterjet machining of difficult-to-machine materials such as high-strength ceramics.

Funding: €483,098.34 (HS Bochum project volume €536,785.20); funded by the EU and the state of NRW (EFRE)



July 2024 – July 2027: CoFill: AI-driven data analysis and prediction models for a more efficient and sustainable circular economy, using Physics-Informed Neural Networks and continual learning.

Project budget: €375,012.40; funded by BMBF



October 2022 – December 2026: Traiber.NRW: Supporting automotive suppliers in the Bergisches Land region in coping with drivetrain transitions via digitalisation and AI-driven innovations.

Funding: €858,883.33 (raised from €747,405 by a supplementary funding decision of 28 October 2025, with the funding period extended to December 2026); funded by the Federal Ministry for Economic Affairs and Climate Action in collaboration with the University of Wuppertal, among others. <https://traiber.nrw/>. Co-led by AKIS professors Clemens Faller and Markus Lemmen.



March 2022 – February 2027: THALES Transfer Project 1: Protecting against extreme weather with artificial intelligence. Prof. Frochte contributing to the AI section with a budget of €89,880.

funded under the Bund-Länder-Initiative “Innovative Hochschule”. The project is led by Prof. Mudersbach. Overall project lead: Mi-Yong Becker. <https://www.hochschule-bochum.de/thales/transferprojekte/>



September 2021 – September 2024: Digital Mentoring; Subproject AI Bochum: AI-supported tools for the study entry phase, namely an adaptive mathematics practice environment that adjusts to individual student abilities, Educational Data Mining to identify dropout risks and success factors, and a Learning Analytics acceptance study across three universities of applied sciences.

Project budget: €948,973; funded by the Foundation for Innovation in Higher Education in collaboration with the Westfälische Hochschule and FH Dortmund. <https://www.hochschule-bochum.de/forschung/digitales-mentoring/>



March 2021 – March 2024: SharKI-C: Developing shared tasks (friendly scientific competitions in which participants create solutions to research problems) as an innovative teaching method, advancing the TIRA platform with AI and Big Data capabilities.

Project budget: €166,545; funded by BMBF Call 2873: University Education through Artificial Intelligence and Big Data, with the University of Leipzig (SharKI-A) and the Bauhaus-Universität Weimar (SharKI-B). <https://sharki-project.github.io/>



March 2019 – December 2022: TIMALIE: Tiered and continual learning methods (capsule networks, tree-based CNNs, and neural-network-based gradient boosting) that learn new tasks without storing old data, enabling GDPR-compliant deployment.

Project budget: €538,310; funded by the EU and the state of NRW (ERFE-040021), subproject of BIT-KI (consortium of the University of Wuppertal, Bochum University of Applied Sciences, and various technology companies). <https://www.bit-ki.de/>



December 2016 – January 2017: Research Cooperation with New Zealand

Project budget: €5,900; funded by the DFG

November 2015 – April 2016: DIBS: Data mining approach to recognise dropout risks at early stages while prioritising data protection.

Project budget: €38,850; funded by the Ministry of Education and Science of the state of NRW



October 2012 – December 2015: SimCloud: Making compute-intensive FEM simulations available as a cloud service while protecting sensitive engineering data; domain decomposition distributes sub-problems across multiple cloud providers, and machine learning optimises load distribution.

Project budget: €310,525; funded by the BMBF (03FH01812)



December 2012: Research infrastructure (Großgeräte für Lehre und Forschung): compute cluster.

Project budget: €68,329; funded by the Ministry of Culture and Science of the state of NRW

Supervision of Doctoral Researchers

Extensive doctoral supervision experience recognised by the **PK NRW** on 18 December 2023.

As primary supervisor

since 2023 **Janis Mohr** – *Architekturen von neuronalen Netzen für Methoden der Erklärbarkeit und des kontinuierlichen Lernens*. PK NRW, Department of Computer and Data Science (with Prof. Dr. Carsten Keßler, HS Bochum, and Prof. Dr.-Ing. Rainer Herpers, HS Bonn-Rhein-Sieg)

As co-supervisor

since 2025 **Markus de Koster** – *Effective Graph Encoding of Power Grids for Machine Learning Tasks*. PK NRW, Department of Resources and Sustainability (with Prof. Dr. Eberhard Waffenschmidt and Prof. Dr. Ingo Stadler, TH Köln)

since 2024 **Dominik Fromme** – *Deep-Learning-gestützte Bildverarbeitung zur Detektion und Vermessung in Aortenklappen*. PK NRW, Department of Technology and Systems (with Prof. Dr.-Ing. Jörg Thiem and Prof. Dr. Erik Kamsties, FH Dortmund)

As further supervisor / mentor (three-member committee)

since 2025 **Ayas Kiser** – *Development of an EEG-Based Biometric System (BCI Biometrics)*. PK NRW, Department of Computer and Data Science (with Prof. Dr.-Ing. Ivan Volosyak, Rhine-Waal UAS, and Prof. Dr.-Ing. Rainer Herpers, HS Bonn-Rhein-Sieg)

since 2024 **Nadir Nadirov** – *AI-Assisted Workflow for Intentional Mistuning and Aeroelastic Optimization of Blisks*. PK NRW, Department of Computer and Data Science (with Prof. Dr. Thomas Bartz-Beielstein, TH Köln, and Prof. Dr.-Ing. Manfred Wirsum, RWTH Aachen)

since 2024 **Thomas Reichelt** – *Einsatz künstlicher Intelligenz in der Denkmalpflege: KI-gestütztes Verfahren zur Detektion und Monitoring von Veränderungen an Bauwerken auf Basis von 3D-Punktwolken*. PK NRW, Department of Construction and Culture (with Prof. Dr. Carsten Keßler, HS Bochum, and Prof. Dr. Anke Fissabre, FH Aachen)

Cooperative doctorates with partner universities

completed 2025 **Basile Tousside** – *Hybrid Method for Continual Learning in Convolutional Neural Networks*. Cooperative doctorate with the **University of Wuppertal**; principal supervision by me, with the degree formally awarded in Wuppertal (Prof. Dr.-Ing. Tobias Meisen)

since 2024 **Jan Weber** – *Social Navigation: Navigation of Mobile Robots in Human Crowds*. Cooperative doctorate with the **University of Würzburg**; co-supervision, with Prof. Dr. Marco Schmidt as first supervisor

Further involvement in external doctorates (as examiner, reviewer, or co-supervisor)

completed 2023 **Weimeng Zhu** – *Contributions to Machine Learning in Automotive Camera and Radar Perception Systems*. University of Wuppertal (first supervisor: Prof. Dr.-Ing. Anton Kummert)

completed 2025 **Miguel Alves Gomes** – *Utilizing Embeddings to Learn Universal Customer Representation in E-Commerce*. University of Wuppertal (first supervisor: Prof. Dr.-Ing. Tobias Meisen)

Selected Invited Talks and Workshops

Conference presentations accompanying the peer-reviewed publications below are not listed separately.

Dec. 2025 Plenary talk *Explainable AI for Successful Human–Robot Collaboration*, 4th International Conference on Advancements in Automation, Robotics and Sensing (**ICAARS 2025**), PSG College of Technology, Coimbatore, India

Dec. 2025	Pre-conference workshop <i>Generative and Edge AI for Automation and Robotics</i> for students, research scholars, and faculty, ICAARS 2025, PSG College of Technology, Coimbatore, India
Sep. 2025	Invited talk <i>The Impact of Modern AI on Higher Education and the Skills of Tomorrow's Workforce</i> , DAAD Dinner Talk hosted by the DAAD Regional Office for Africa, Nairobi, Kenya (report)
Oct. 2024	Invited talk <i>The Role of Continuous Learning and Explainable AI in Advancing Sustainable AI</i> , seminar series Artificial Intelligence and Human Systems (AIHS), Durham University , UK
2024	Panellist, public panel discussion <i>Fluch oder Segen? KI in Wirtschaft, Wissenschaft und Gesellschaft</i> , KI-Fachsymposium, Rheinische Hochschule Köln
Oct. 2023	Invited talk <i>Fostering a Sustainable Future: The Role of Data-Driven Innovations</i> , given in his then-role as Head of AKIS Ruhr, Digital Transformation Innovation Institute (DTII), Cardiff University, UK (report)

Books and Monographs

- Lampe, J., Frochte, J., de Koster, M., Mack, P., Parvaresh, A., Richter, M., Turan, B. & Wett, C. (2026). *KI in der Energietechnik: Einblicke in technische Herausforderungen und Potentiale*. Springer Vieweg, essentials series. ISBN 978-3-658-52829-4; announced for October 2026. link.springer.com
- Rosenthal, S., Kutsche, R., Deiters, W., Frochte, J. & Schneider, F. *KI in der Medizin: Nutzen, Risiko und Vertrauen bei der prognostischen Unterstützung*. Springer, essentials series; in preparation.
- Frochte, J. (2020). *Maschinelles Lernen: Grundlagen und Algorithmen in Python*, 3rd expanded edition. Carl Hanser Verlag, 616 pages. ISBN 978-3-446-46144-4
- Frochte, J. (2019). *Maschinelles Lernen: Grundlagen und Algorithmen in Python*, 2nd corrected edition. Carl Hanser Verlag. ISBN 978-3-446-45996-0
- Frochte, J. (2018). *Maschinelles Lernen: Grundlagen und Algorithmen in Python*, 1st edition. Carl Hanser Verlag. ISBN 978-3-446-45291-6
- Frochte, J. (2016). *Finite-Elemente-Methode: Eine praxisbezogene Einführung mit GNU Octave/MATLAB*. Carl Hanser Verlag, 320 pages. ISBN 978-3-446-44665-6

Memberships & Affiliations

Since 2020	Founding Member of the Interdisciplinary Institute for Applied Artificial Intelligence and Data Science Ruhr (AKIS Ruhr), Bochum University of Applied Sciences; Head of the institute from its foundation in December 2020 until January 2024, since then Deputy Head and Member of the Leading Board
Since 2019	Scientific Director of the AI continuing-education programme WeAI (Weiterbildung AI), Bochum University of Applied Sciences
Since 2017	Member of the Graduate Institute NRW; since December 2020 of its successor, the Promotionskolleg NRW, Department of Computer and Data Science (member profile)
Since 2018	Associate Member of the Interdisciplinary Centre for Machine Learning and Data Analytics (IZMD), University of Wuppertal
Since 2018	Founding Member of the Bergisch Innovation Platform for Artificial Intelligence (BIT-KI)

Academic Self-Governance

Since 2026	Programme Coordinator (Studiengangsbeauftragter) of the Applied Computer Science degree programme, Campus Velbert/Heiligenhaus, including responsibility for the incoming students from the PSG College of Technology (Coimbatore, India)
Since 2024	Member of the Senate of the PK NRW
2023 – 2026	Member of the Doctoral Examining Committee (Promotionsausschuss), Department of Computer and Data Science , PK NRW; deputy member since July 2026 (term until 2029)
Since 2021	Member of the Department Council (Computer and Data Science), PK NRW
2016 – 2020	Elected Senator, Bochum University of Applied Sciences; member of the Quality Improvement Commission and Chair of the Research Commission
2016 – 2019	Member of the Curriculum Committee, Department of Electrical Engineering and Computer Science
2010 – 2020	Chair of the Examination Board for the study programmes at the Heiligenhaus campus

Service to the Research Community (2020-2026)

2024 – 2026	Mentor in the AdvanceScience Mentoring Programme of the University of Stuttgart (mentee: Dr. Kerem Kayabay, HLRS)
Ongoing	Mandated member of the Sounding Board Digital Transformation of the DH.NRW
2025	Technical Programme Committee Chair, 4th International Conference on Advancements in Automation, Robotics and Sensing (ICAARS 2025), PSG College of Technology, Coimbatore, India
2025	Member of the Selection Committee, Carl-Zeiss-Stiftung CZS Wildcard programme (evaluation of ca. ten project proposals with funding volumes of up to €750,000 each)
2025	Reviewer, 28th International Conference on Artificial Intelligence and Statistics (AISTATS 2025), including the rebuttal and discussion phase
2024 – 2025	Member of the Jury, journal funding programme (Zeitschriftenförderung) of the state initiative openaccess.nrw
2024	Member of the Programme Committee and reviewer, ACM Technical Symposium on Computer Science Education (SIGCSE TS 2024)
2023 – 2025	Reviewer, Carl-Zeiss-Stiftung Stiftungsprofessuren HAW: member of the selection committee in 2023 (for the DLR Projektträger), expert reviews in the 2024 and 2025 rounds, and on-site evaluation of project pitches (2024)
2023	Reviewer for the DAAD in the RISE Worldwide (RISE weltweit) programme
2022 – 2025	Reviewer, Carl-Zeiss-Stiftung Forschungsstart programme (2022, 2023, and 2025)
2023	Reviewer for a statement by the LRK in the NRW state parliament on ChatGPT
2022	Reviewer, “Der KI-Wettbewerb im ÖPNV in NRW” for the Kompetenzzentrum Digitalisierung NRW
2022	Reviewer, 25th International Conference on Artificial Intelligence and Statistics (AISTATS)
2020	Reviewer for the BMBF funding programme “Digital GreenTech – Umwelttechnik trifft Digitalisierung” (Projektträger Jülich)
2020	Mentor, Doctoral Consortium, 43rd German Conference on Artificial Intelligence (KI 2020)

Publications (Peer-Reviewed, 2015-2026)

- 2026 Grewe, S. & Frochte, J. **Physics-Informed Machine Learning Under Small-Data Constraints: Lessons from Abrasive Waterjet Milling.** *International Conference on Artificial Neural Networks (ICANN 2026)* (Springer). [arXiv:2607.07863](#) – Accepted, to be published
- Schwengber Kelm, A., Bockermann, C. & Frochte, J. **Multi-Class vs. Multi-Label BERT for CVE-to-CWE Mapping: How Taxonomy Structure Shapes the Errors.** *International Conference on Artificial Neural Networks (ICANN 2026)* (Springer). [arXiv:2607.07573](#) – Accepted, to be published
- Mohr, J. & Frochte, J. **GB-KAN: Gradient Boosting with Interpretable Kolmogorov-Arnold Networks.** *18th International Conference on Agents and Artificial Intelligence (ICAART 2026)*, Vol. 3, pp. 2421–2432. [doi:10.5220/0014246800004052](#)
- 2025 Sandfuchs, S., Melchert, M. & Frochte, J. **LLMs for Text-Based Exploration and Navigation under Partial Observability.** *International Conference on Advancements in Automation, Robotics and Sensing (ICAARS 2025)* (Springer). [doi:10.48550/arXiv.2604.09604](#) – Accepted, to be published
- Tousside, B., Meisen, T. & Frochte, J. **Dynamic Capacity Expansion in Continual Learning: The eSECL Approach.** *16th International Conference on Agents and Artificial Intelligence (ICAART 2024)*, Rome. [doi:10.1007/978-3-031-87327-0_13](#)
- Mohr, J. & Frochte, J. **Multiple Additive Neural Networks for Structured and Unstructured Data.** *15th International Joint Conference on Computational Intelligence (IJCCI 2023)*, Rome. [doi:10.1007/978-3-031-85252-7_10](#)
- 2024 Bockermann, C., Frochte, J. & Schilberg, D. **Angewandte Künstliche Intelligenz im Verbund verschiedener Fachbereiche.** *INFORMATIK 2024*, Wiesbaden. [doi:10.18420/inf2024_192](#)
- Neugebauer, M., Erlebach, R., Kaufmann, C., Mohr, J. & Frochte, J. **Efficient Learning Processes by Design: Analysis of Usage Patterns in Differently Designed Digital Self-Learning Environments.** *16th International Conference on Computer Supported Education (CSEDU 2024)*, Angers. [doi:10.5220/0012558200003693](#)
- Tousside, B., Frochte, J. & Meisen, T. **CNNs Sparsification and Expansion for Continual Learning.** *16th International Conference on Agents and Artificial Intelligence (ICAART 2024)*, Vol. 2, pp. 110–120, Rome. [doi:10.5220/0012314000003636](#)
- Asatryan, H., Tousside, B., Mohr, J., Neugebauer, M., Frochte, J. & Bijl, H. **Exploring Student Expectations and Confidence in Learning Analytics.** *14th Learning Analytics and Knowledge Conference (LAK 2024)*, Kyoto. [doi:10.1145/3636555.3636923](#)
- Elstner, T., Hanle, B., Loebe, F., Fröbe, M., Kolyada, N., Mohr, J., Stein, B., Potthast, M. & Frochte, J. **Classification of Shared Tasks Used in Teaching.** *29th ACM Conference on Innovation and Technology in Computer Science Education (ITiCSE 2024)*, Milan. [doi:10.1145/3649217.3653559](#)
- 2023 Neugebauer, M. & Frochte, J. **Steigerung von Lernerfolg und Motivation durch gamifizierte Mathematik-Aufgaben in Lernmanagementsystemen.** *21. Fachtagung Bildungstechnologien (DELFI)*, pp. 247–248. [doi:10.18420/delfi2023-39](#)

- Mohr, J. & Frochte, J. **One-Shot Identification with Different Neural Network Approaches**. *Studies in Computational Intelligence*, Vol. 1119, pp. 205–222 (Springer). doi:10.1007/978-3-031-46221-4_10
- Mohr, J., Tousside, B., Schmidt, M. & Frochte, J. **Multiple Additive Neural Networks: A Novel Approach to Continuous Learning in Regression and Classification**. *15th International Conference on Neural Computation Theory and Applications (NCTA 2023)*. doi:10.5220/0012234000003595
- Elstner, T., Loebe, F., Ajjour, Y., Akiki, C., Bondarenko, A., Fröbe, M., Gienapp, L., Kolyada, N., Mohr, J., Sandfuchs, S., Wiegmann, M., Ferro, N., Hofmann, S., Stein, B., Hagen, M., Potthast, M. & Frochte, J. **Shared Tasks as Tutorials: A Methodical Approach**. *Proceedings of the AAAI Conference on Artificial Intelligence*, Vol. 37, pp. 15807–15815. doi:10.1609/aaai.v37i13.26877
- Neugebauer, M., Tousside, B. & Frochte, J. **Success Factors for Mathematical e-Learning Exercises Focusing First-Year Students**. *15th International Conference on Computer Supported Education (CSEDU 2023)*, Vol. 2, pp. 306–317. doi:10.5220/0011858400003470
- 2022 Tousside, B., Dama, Y. & Frochte, J. **Towards Explainability in Modern Educational Data Mining: A Survey**. *14th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management*, pp. 212–220. doi:10.5220/0011529400003335
- Tousside, B., Mohr, J. & Frochte, J. **Group and Exclusive Sparse Regularization-based Continual Learning of CNNs**. *Canadian Conference on Artificial Intelligence*. doi:10.21428/594757db.b7e2fbf3 – Best Paper Award
- Quetscher, F., Kaufmann, C. & Frochte, J. **Investigation of Capsule Networks Regarding their Potential of Explainability and Image Rankings**. *14th International Conference on Agents and Artificial Intelligence (ICAART 2022)*, Vol. 3, pp. 343–351. doi:10.5220/0010821600003116
- Sandfuchs, S., Schmidt, M. & Frochte, J. **Novel Approaches for Periodic Depth Enhancement in Visual SLAM**. *Advances in Service and Industrial Robotics*, pp. 436–443 (Springer). doi:10.1007/978-3-031-04870-8_51
- Tousside, B., Friedrichsen, L. & Frochte, J. **Towards Robust Continual Learning using an Enhanced Tree-CNN**. *14th International Conference on Agents and Artificial Intelligence (ICAART 2022)*, Vol. 3. doi:10.5220/0010819800003116
- 2021 Mohr, J., Tousside, B., Schmidt, M. & Frochte, J. **Explainability and Continuous Learning with Capsule Networks**. *13th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management (IC3K 2021)*, Vol. 1, pp. 264–273. doi:10.5220/0010681300003064
- Mohr, J., Breidenbach, F. & Frochte, J. **An Approach to One-shot Identification with Neural Networks**. *13th International Joint Conference on Computational Intelligence (IJCCI 2021)*, pp. 344–351. doi:10.5220/0010684300003063
- 2020 Marsland, S. & Frochte, J. **Regression Learning on Patches**. *2020 IEEE Symposium Series on Computational Intelligence (SSCI)*, pp. 1786–1793. doi:10.1109/SSCI47803.2020.9308514
- Lemmen, M., Schmidt, M. & Frochte, J. **Concerning the Integration of Machine Learning Content in Mechatronics Curricula**. *Revolutionizing Education in the Age of AI and Machine Learning*, pp. 75–96 (IGI Global). doi:10.4018/978-1-5225-7793-5.ch004
- Tousside, B., Mohr, J., Schmidt, M. & Frochte, J. **A Learning Approach for Optimizing Robot Behavior Selection Algorithm**. *Intelligent Robotics and Applications (ICIRA 2020)*, Vol. 12595, pp. 171–183 (Springer). doi:10.1007/978-3-030-66645-3_15

- 2019 Marsland, S. & Frochte, J. **A Learning Approach for Ill-Posed Optimisation Problems.** *Data Mining (AusDM 2019)*, Vol. 1127, pp. 16–27 (Springer). doi:10.1007/978-981-15-1699-3_2 – *Best Paper Award*
- Börzel, S. & Frochte, J. **Case Study on Model-based Application of Machine Learning Using Small CAD Databases for Cost Estimation.** *11th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management (KDIR 2019)*, Vol. 1, pp. 258–265, Vienna. doi:10.5220/0007979802580265
- 2018 Lemmen, M., Schmidt, M. & Frochte, J. **Seamless Integration of Machine Learning Contents in Mechatronics Curricula.** *19th International Conference on Research and Education in Mechatronics (REM 2018)*, Delft. doi:10.1109/REM.2018.8421794
- 2016 Bernst, I. & Frochte, J. **Success Prediction System for Student Counseling Using Data Mining.** *8th International Conference on Knowledge Discovery and Information Retrieval (KDIR 2016)*, pp. 181–189, Porto. doi:10.5220/0006036401810188
- Kaufmann, C. & Frochte, J. **A Case Study on FMU as Co-Simulation Exchange Format for FEM Models.** *13th International Conference on Applied Computing 2016*, pp. 11–18, Mannheim. (pdf)
- Bernst, I., Kaufmann, C. & Frochte, J. **On Learning Assistance Systems for Numerical Simulation.** *International Journal on Computer Science and Information Systems*, Vol. 11, pp. 115–133. (pdf)
- 2015 Bouillon, P., Lemmen, M. & Frochte, J. **Influence of Plant Model Variants for the Automatic Optimisation of Control Parameters.** *16th International Conference on Research and Education in Mechatronics (REM 2015)*, pp. 80–87, Bochum. doi:10.1109/REM.2015.7380376
- Bouillon, P. & Frochte, J. **Simulation- and Web-Based E-Learning in Engineering – Open Source Architecture and Didactic Issues.** *16th International Conference on Research and Education in Mechatronics (REM 2015)*, pp. 127–134, Bochum. doi:10.1109/REM.2015.7380382
- Bernst, I., Kaufmann, C. & Frochte, J. **Learning Load Balancing for Simulation in Heterogeneous Systems.** *12th International Conference on Applied Computing 2015*, pp. 121–128, Greater Dublin. doi:10.13140/2.1.1780.8328

Earlier peer-reviewed publications (2005–2014, numerical mathematics and computational fluid dynamics):
a further twelve papers; full list on [ORCID](#) and [joerg.frochte.de](#).

Preprints (Under Review)

- Ashmitha R & Frochte, J. **Directional Curvature from Armijo Backtracking: A Low-Cost Sharpness Probe and a Calibration-Free Learning-Rate Safeguard for Adam.** Preprint, under review at TMLR (Transactions on Machine Learning Research). [arXiv:2607.03998](#)
- Frochte, J. **When Style Similarity Scores Fail: Diagnosing Raw CSD Cosine in Artist-Style Evaluation.** Preprint, submitted to BMVC 2026. [arXiv:2605.09030](#)

Open Data and Research Outputs

- Frochte, J., Neugebauer, M., Tousside, B., Asatryan, H., Spiegelberg, P., Bijl, H., & Mohr, J. (2024). Anonymized Responses to the Student Expectation of Learning Analytics Questionnaire (SELAQ) in 2022 and 2023 (1.0.0) [Open Data Set]. The 14th International Learning Analytics and Knowledge Conference (LAK 24), Kyoto, Japan. Zenodo. [doi:10.5281/zenodo.11638469](https://doi.org/10.5281/zenodo.11638469)
- Burrows, S., Stein, B., Frochte, J., Gollub, T., Hirsch, P., Opolka, J., Paschke, T., & Völske, M. (2012). Webis Simulation Data Mining Bridge Models Corpus 2012 (Webis-SDMbridge-12) [Open Data Set]. 9th Australasian Data Mining Conference (AusDM 2011). Zenodo. [doi:10.5281/zenodo.3259676](https://doi.org/10.5281/zenodo.3259676)
- Sandfuchs, S., Farooghi, D., Mohr, J., Grewe, S., Lemmen, M. & Frochte, J. (2026). Responsible AI in Business (preprint). [arXiv:2602.13244](https://arxiv.org/abs/2602.13244)

Science Communication

- Factsheet “Lokale und selbstgehostete LLMs” (Traiber.NRW), 2025. traiber.nrw
- Customer magazine of Stadtwerke Bochum titled “KI Startet durch”, September 2023. stadtwerke-bochum.de
- “KI als Chance: Pro & Contra”, IHK Magazin, 2023. ihkmagazin.de
- “Technische Grundlagen”, Linux-Magazin, September 2022. linux-magazin.de
- “Zuverlässige KI und Transparenz auf unstrukturierten Daten”, Informatik Aktuell, June 2020. informatik-aktuell.de