

PROFILE

Computational research scientist specializing in visualization, ML-driven analysis, and scientific workflows for high-throughput experiments and large-scale simulations. Research focus on autonomous experimentation, methods to identify and contextualize features and interactive visual analytics interfaces to configure and steer experiments and their associated workflows.

EXPERIENCE

Present 01/2023	Computational Research Scientist, LAWRENCE BERKELEY NATIONAL LABORATORY, USA > Architect high-throughput scientific workflows and autonomous analysis pipelines to accelerate data processing and experimental decision-making across collaborating user facilities (light sources, nanocenters, HPC centers). > Design interactive visual analytics tools to configure classical and ML-based workflows, explore high-dimensional data, and communicate results across domain experts, data specialists, and experimental teams. > Serve as Program Lead for Workflows and Visualization (since 2025), guide technical direction, supervise research software engineers, and mentor postdocs and interns (since 2023). Autonomous Workflows Real-Time Analysis Scientific Visualization Technical Leadership
12/2022 01/2017	Research and Teaching Assistant, KTH ROYAL INSTITUTE OF TECHNOLOGY, SWEDEN > Developed static summary visualizations and 3D animated visualizations for time-dependent scalar fields from large-scale fluid flow simulations using topological feature extraction, and layout optimizations. > Instructed graduate-level courses and designed practical lab exercises in visualization and machine learning. Topological Data Analysis Scientific Visualization Teaching
12/2016 06/2016	Research and Teaching Assistant, TECHNICAL UNIVERSITY OF MUNICH, GERMANY > Engineered adaptive transfer functions enabling multiplicative interactions for deep neural networks using custom complex-valued CUDA kernels in Theano and evaluated their performance on physics-based datasets. > Co-developed a flipped-classroom format for a graduate machine learning course with over 500 students. Neural Networks Machine Learning Teaching

SKILLS

Core Expertise	Scientific Visualization, ML&AI for Science, Scientific Workflows, Topological Data Analysis
Languages	Python, C++, JavaScript, Bash
Data & Analytics	NumPy, Pandas, SciPy, scikit-learn, PyTorch, Inviwo, ParaView/VTK, D3, Matplotlib, Dash Plotly, Topology Toolkit
Platform & Dev	SLURM, Docker, Prefect, MLflow, VS Code, Git, GitHub Actions, CMake
Data Modalities	Volumetric / High-dimensional, Multi-modal, Time-varying, Large-scale, Hierarchical
Data Sources	Small- and Wide-Angle X-Ray Scattering (SAXS/WAXS/GiSAXS/GiWAXS), Micro-Computed Tomography (MicroCT), Atomic Force Microscopy (AFM), Computational Fluid Dynamics (CFD) Simulations from Nek5000 and ECEarth

EDUCATION

12/2022 01/2017	Ph.D. in High Performance Computing and Visualization, KTH ROYAL INSTITUTE OF TECHNOLOGY, SWEDEN Thesis: <i>Static Visualizations for Dynamic Hierarchies</i>
06/2016 10/2012	M.Sc. in Eng. Computer Science & Engineering / M.Sc. in Informatics (Double Degree), KTH ROYAL INSTITUTE OF TECHNOLOGY, SWEDEN TECHNICAL UNIVERSITY OF MUNICH, GERMANY Thesis: <i>A Novel Transfer Function for Continuous Interpolation between Summation and Multiplication in Neural Networks</i>
08/2012 10/2009	B.Sc. in Informatics, TECHNICAL UNIVERSITY OF MUNICH, GERMANY Thesis: <i>Representation of General Geometric Forms for Humanlike Problem Solving</i>

HONORS & AWARDS

2024, 2026	ALS Spot Awards, LBNL – Deployed GUI-driven ML frameworks for tomography segmentation
2024, 2026	Special Recognitions for Outstanding Review, TopoInVis Workshop (2x) – IEEE PacificVis
2019, 2021	Best Paper Honorable Mention & Best Visualization Showcase Awards, IEEE LDAV – PEARC
2011–2015	Academic Fellowships (TUM), Deutschlandstipendium – TUM Junge Akademie – Best.in.tum (Top 2%)

- [1] **W. Koepp**, B. Sochor, D. McReynolds, T. Chavez, M. M. Noack, R. V. Sriramoju, A. Coffey, Y. Wang, E. Henn, A. K. Sambale, E. Eulichler, D. English, F. Schlünzen, E. Schaible, C. Zhu, S. Koyiloth Vayalil, S. V. Roth, and A. Hexemer. “Toward Unified Autonomous Scattering Experiments with a Cross-Facility Case Study at ALS and PETRA III”. *Photon Science* (Mar. 2, 2026).  [doi 10.1021/photonsci.5c00044](https://doi.org/10.1021/photonsci.5c00044).  [illumine-project/saxswaxs-workflows](https://github.com/illumine-project/saxswaxs-workflows).
- [2] T. Chavez, Z. Zhao, R. Jiang, **W. Koepp**, D. McReynolds, P. H. Zwart, D. B. Allan, E. H. Gann, N. Schwarz, D. Ushizima, E. S. Barnard, A. Mehta, S. Sankaranarayanan, and A. Hexemer. “A Machine Learning-Driven Data Labeling Pipeline for Scientific Analysis in MLEXchange”. *Journal of Applied Crystallography* 58.3 (May 2025), pp. 731–745.  [doi 10.1107/S1600576725002328](https://doi.org/10.1107/S1600576725002328).  [mlexchange/mlex_labelmaker](https://github.com/mlexchange/mlex_labelmaker).
- [3] M. Atzori, **W. Köpp**, S. W. D. Chien, D. Massaro, F. Mallor, A. Peplinski, M. Rezaei, N. Jansson, S. Markidis, R. Vinuesa, E. Laure, P. Schlatter, and T. Weinkauff. “In-situ visualization of large-scale turbulence simulations in Nek5000 with ParaView Catalyst”. *Journal of Supercomputing* 78.3 (Feb. 2022), pp. 3605–3620.  [doi 10.1007/s11227-021-03990-3](https://doi.org/10.1007/s11227-021-03990-3).  [KTH-Nek5000/InSituPackage](https://github.com/KTH-Nek5000/InSituPackage).
- [4] **W. Köpp** and T. Weinkauff. “Temporal Merge Tree Maps: A Topology-Based Static Visualization for Temporal Scalar Data”. *IEEE Transactions on Visualization and Computer Graphics* 29.1 (2022): *Proceedings IEEE VIS*, pp. 1157–1167.  [doi 10.1109/TVCG.2022.3209387](https://doi.org/10.1109/TVCG.2022.3209387).  [Wiebke/TemporalMergeTreeMaps](https://github.com/Wiebke/TemporalMergeTreeMaps).
- [5] **W. Köpp** and T. Weinkauff. “Temporal Treemaps: Static Visualization of Evolving Trees”. *IEEE Transactions on Visualization and Computer Graphics* 25.1 (2019): *Proceedings IEEE VIS*, pp. 534–543.  [doi 10.1109/TVCG.2018.2865265](https://doi.org/10.1109/TVCG.2018.2865265).  [Wiebke/TemporalTreeMaps](https://github.com/Wiebke/TemporalTreeMaps).