

WIEBKE KÖPP

PERSONAL INFORMATION

Website wiebke.github.io

RESEARCH INTERESTS

Visualization and analysis of scientific data with a special focus on improved and novel user interfaces, algorithmic techniques for identifying and tracking features, and visualization of high-dimensional and multi-modal data.

WORK EXPERIENCE

- 2023–present **Computational Research Scientist** · *Lawrence Berkeley National Laboratory*
Development and deployment of computational processes for experimental design, data management, analysis, and visualization at the [Advanced Light Source](#) and other collaborating user facilities
- 2017–2022 **Research and Teaching Assistant** · *Royal Institute of Technology (KTH)*
Researching visualization of dynamic hierarchies for features within scalar fields or other quantitative hierarchical data
Teaching graduate courses in visualization, computer graphics and machine learning
- 2016 **Research and Teaching Assistant** · *Technische Universität München (TUM)*
Researching novel adaptive transfer functions for use in artificial neural networks
Responsible for the topics decision trees, k -nearest neighbors and Gaussian processes in the introductory graduate machine learning course
- 2011–2015 **Teaching Assistant** · *TUM*
Teaching undergraduate courses in math and computer science

EDUCATION

- 2017–2022 **Ph.D. High Performance Computing and Visualization** · *KTH*
Thesis: Static Visualizations for Dynamic Hierarchies [[DiVA entry](#)]
Advisor: Prof. Dr. Tino Weinkauff
- 2013–2016 **M.Sc. in Eng. Computer Science and Engineering** · *KTH*
Thesis [[pdf](#)] was jointly supervised in a double degree with TUM, see below
Examiner: Prof. Dr. Anders Lansner · Supervisor: Prof. Dr. Erik Fransén
- 2012–2015 **M.Sc. Informatics** ·
Thesis: A Novel Transfer Function for Continuous Interpolation between Summation and Multiplication in Neural Networks [[pdf](#)]
Supervisor: Prof. Dr. Patrick van der Smagt · Advisor: Dr. Sebastian Urban
Overall GPA: 1.0 (top 2.3%) · Application Area: Mathematics
- 2009–2012 **B.Sc. Informatics** · *TUM*
Thesis: Representation of General Geometric Forms for Humanlike Problem Solving [[pdf](#)]
Supervisor: Dr. Alexandra Kirsch
Overall GPA: 1.5 · Application Area: Mathematics

HONORS AND AWARDS

- 2021 **Best Visualization Showcase Award at PEARC 2021** [[link](#)]

with Marco Atzori, Mohamad Rezaei, Niclas Jansson, Ricardo Vinuesa, Erwin Laure, Philipp Schlatter, and Tino Weinkauff. for *Effects of Blowing and Suction on the Turbulent Flow Around an Airfoil*

2019 Best Paper Honorable Mention Award at LDAV 2019 [[link](#)]

with Anke Friederici, Marco Atzori, Ricardo Vinuesa, Philipp Schlatter, and Tino Weinkauff for *Distributed Percolation Analysis for Turbulent Flows*

2011–2015 Best.in.tum [[link](#)], TUM Young Academy (TUM Junge Akademie) [[link](#)], and National Scholarship Program (Deutschlandstipendium) [[link](#)]

Programs for outstanding, highly dedicated students at the TUM Department of Informatics, at TUM and by the German government in cooperation with private sponsors

PEER-REVIEWED PUBLICATIONS

January 2023 Temporal Merge Tree Maps: A Topology-Based Static Visualization for Temporal Scalar Data

Wiebke Köpp and Tino Weinkauff, IEEE Transactions on Visualization & Computer Graphics (Proceedings IEEE VIS 2022) 29(1) 1157–1167.
[DOI: [10.1109/TVCG.2022.3209387](#), [project website](#), [code](#)]

January 2022 In-situ visualization of large-scale turbulence simulations in Nek5000 with ParaView Catalyst

Marco Atzori, **Wiebke Köpp**, Steven W. D. Chien, Daniele Massaro, Fermín Mallor, Adam Peplinski, Mohamad Rezaei, Niclas Jansson, Stefano Markidis, Ricardo Vinuesa, Erwin Laure, Philipp Schlatter, Tino Weinkauff, Journal of Supercomputing 78(3) 3605—3620.
[DOI: [10.1007/s11227-021-03990-3](#), [code](#)]

September 2021 Notes on Percolation Analysis of Sampled Scalar Fields

Wiebke Köpp*, Anke Friederici*, Marco Atzori, Ricardo Vinuesa, Philipp Schlatter, and Tino Weinkauff, Topological Methods in Data Analysis and Visualization VI 39—54, *presented at the workshop on Topology-Based Methods in Visualization (TopoInVis) 2019, Nyköping, Sweden*
[DOI: [10.1007/978-3-030-83500-2_3](#), [project website](#)]

October 2019 Distributed Percolation Analysis for Turbulent Flows

Anke Friederici*, **Wiebke Köpp***, Marco Atzori, Ricardo Vinuesa, Philipp Schlatter, and Tino Weinkauff, 9th IEEE Symposium on Large Data Analysis and Visualization (LDAV) 2019. Vancouver, Canada.
[DOI: [10.1109/LDAV48142.2019.8944383](#), [project website](#), [code](#)]

January 2019 Temporal Treemaps: Static Visualization of Evolving Trees

Wiebke Köpp and Tino Weinkauff, IEEE Transactions on Visualization & Computer Graphics (Proceedings IEEE VIS 2018) 25(1) 534–543.
[DOI: [10.1109/TVCG.2018.2865265](#), [project website](#), [code](#)]

April 2016 A Differentiable Transition Between Additive and Multiplicative Neurons

Wiebke Köpp, Patrick van der Smagt and Sebastian Urban, International Conference on Learning Representations (ICLR) 2016 Workshop Track. arXiv: [1604.03736](#) [[cs.LG](#)]

*Both authors contributed equally

PUBLIC SCIENCE COMMUNICATION

November 2020 Effects of Blowing and Suction on the Turbulent Flow around an Airfoil

Wiebke Köpp, Marco Atzori, Mohamad Rezaei, Niclas Jansson, Ricardo Vinuesa, Erwin Laure, Philipp Schlatter, and Tino Weinkauff, 73rd Annual Meeting of the APS Division of Fluid Dynamics. Gallery of Fluid Motion 2020 and in adapted form at ACM Practice & Experience in Advanced Research Computing (PEARC) 2021.
[DOI: [10.1103/APS.DFD.2020.GFM.V0058](#), [video](#)]

TEACHING

<i>Lecture</i>	Visualization (Guest Lecture) · Autumn 19 · KTH Machine Learning I (3 Lectures) · Winter 16/17 · TUM · [materials , lecture video]
<i>Thesis Supervision</i>	Interactive Visual Exploration of Causal Structures for Neuropathic Pain Diagnosis (Yuwen Hu, co-supervised with Ruibo Tu) · Spring 21 · KTH · [prototype]
<i>Teaching Assistant Management</i>	Visualization · Autumn 20–21 · KTH Introduction to Visualization and Graphics · Spring 20–21 · KTH
<i>Tutorial</i>	Visualization · Autumn 17–21 · KTH Introduction to Visualization and Graphics · Spring 17–21 · KTH Artificial Neural Networks · Spring 17–20, Autumn 18–19 · KTH Computer Graphics and Interaction · Spring 17–19 · KTH Information Visualization · Spring 18 · KTH Discrete Structures · Winter 14/15 · TUM Prep Course: Mathematics for Computer Science · Winter 14/15 · TUM Fundamentals of Algorithms and Data Structures · Summer 2013 · TUM Linear Algebra for Physicists · Winter 2012/13 · TUM Introduction to Software Engineering · Summer 2011 · TUM
<i>Training</i>	Supervision and Assessment of Degree Project Work · Autumn 19 · KTH Basic Teaching and Communication · Spring 17 · KTH Teaching Certificate: Tutoring · Summer 13–Winter 14/15 · ProLehre TUM

SKILLS

<i>Specialties</i>	Scientific Visualization · Topological Data Analysis · Machine Learning
<i>Visualization</i>	Inviwo · ParaView · ParaView Catalyst · Matplotlib
<i>Programming Languages</i>	C++ · PYTHON · JAVASCRIPT German (Native) · English (Fluent) · Swedish (Advanced)

PROFESSIONAL ACTIVITIES

<i>Reviewing</i>	IEEE VIS 2018, IEEE VIS 2020, Neurocomputing, IEEE VIS 2022, EuroVis 2023, TopoInVis 2023 (Program Committee)
<i>Open-Source Development</i>	Inviwo [code]
<i>Doctoral Student Representation</i>	Member of the EECS PhD Student Council · January 2020 - December 2021 Chair of the EECS PhD Student Council (during 2021) Member of the Council for Third Cycle Education (EECS Forskarutbildningsråd) Member of the School Management Council (EECS Ledningsråd, during 2021) Program-Responsible PhD Student for the Doctoral Program in Computer Science (during 2020) Member of the Doctoral Program Council in Computer Science (Forskarprogramrådet) for the Specializations <i>High Performance Computing and Visualization</i> and <i>Computational Biology</i>