Jakob Troidl

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ABOUT

I am a Ph.D. candidate in computer science at Harvard University, advised by Hanspeter Pfister. I am broadly interested in data visualization and applied machine learning, especially with applications in connectomics. Specifically, my research focuses on building scalable interactive visual analysis tools and representation learning approaches to analyze the hidden architecture of the brain.

EDUCATION

Harvard University   Cambridge, MA
Ph.D. in Computer Science, Advisor: Prof. Hanspeter Pfister   2021–2027
  − Focus: Data Visualization, Applied ML, Connectomics

TU Wien   Vienna, Austria
M.Sc. & B.Sc (with Honors) in Computer Science, Advisor: Prof. Eduard Gröller   2015–2021
  − Focus: Data Visualization, Biomedical Imaging, Computer Vision
  − GPA: 1.1/1.0

EXPERIENCE

E11 Bio   Alemeda, CA
Machine Learning Fellow   04/2025 - present
  − Learning Automated Error Correction in Connectomics

HHMI Janelia   Ashburn, VA
Visiting Researcher with Dr. Srinivas Turaga   05/2024 - present
  − Building Generative Models of Neuronal Morphology

Harvard University   Cambridge, MA
Research Assistant with Prof. Hanspeter Pfister   09/2021 - present
  − Visualization of Large-Scale Biomedical Data
  − Towards Efficient and Scalable Analysis Tools for Connectomics

King Abdullah University of Science & Technology (KAUST)   Thuwal, Saudi Arabia
Research Intern with Prof. Markus Hadwiger   02/2019 - 05/2019
  − Observer Relative Flow Visualization in Curved Spaces
  − Co-authored a publication which won the SciVis Best Paper Award at IEEE VIS 2020

Brainlab AG   Munich, Germany
Research Intern   08/2018 - 01/2019
  − Path Tracing for Realtime 3D Medical Visualization
  − Mixed Reality for 3D Medical Visualization

Peer Reviewed Publications

[1] S. Dorkenwald, C. M. Schneider-Mizell, D. Brittain, A. Halageri, C. Jordan, N. Kemnitz, M. A. Castro, W. Silversmith, J. Maitin-Shephard, **J., Troidl**, *et al.*, "CAVE: Connectome Annotation Versioning Engine", *Nature Methods*, 2025.

[2] S. Prabhakaran, C. Yapp, G. J. Baker, J. Beyer, Y. H. Chang, A. L. Creason, R. Krueger, J. Muhlich, N. H. Patterson, K. Sidak, D. Sudar, A. J. Taylor, L. Ternes, **J., Troidl**, Y. Xie, A. Sokolov, D. R. Tyson, and the Cell Imaging Hackathon Participants, "Addressing persistent challenges in digital image analysis of cancer tissue: Resources developed from a hackathon", *Molecular Oncology*, pp. 2025–02, 2025.

[3] A. Shapson-Coe, M. Januszewski, D. R. Berger, A. Pope, Y. Wu, T. Blakely, R. L. Schalek, P. H. Li, S. Wang, J. Maitin-Shepard, N. Karlupia, S. Dorkenwald, E. Sjostedt, L. Leavitt, D. Lee, **J. Troidl**, F. Collman, L. Bailey, A. Fitzmaurice, R. Kar, B. Field, H. Wu, J. Wagner-Carena, D. Aley, J. Lau, Z. Lin, D. Wei, H. Pfister, A. Peleg, V. Jain, and J. W. Lichtman, "A petavoxel fragment of human cerebral cortex reconstructed at nanoscale resolution", *Science*, vol. 384, no. 6696, 2024.

[4] S. Warchol, **J. Troidl**, J. L. Muhlich, R. Krueger, J. Hoffer, T. Lin, J. Beyer, E. Glassman, P. K. Sorger, and H. Pfister, "psudo: Exploring Multi-Channel Biomedical Image Data with Spatially and Perceptually Optimized Pseudocoloring", *Computer Graphics Forum (Proceedings Eurographics/IEEE Symposium on Visualization, Eurovis 2024*, vol. 43, no. 3, 2024.

[5] Z. Chen, C. Zhang, Q. Wang, **J. Troidl**, S. Warchol, J. Beyer, N. Gehlenborg, and H. Pfister, "Beyond Generating Code: Evaluating GPT on a Data Visualization Course", *IEEE VIS Workshop on Visualization Education, Literacy, and Activities*, 2023.

[6] P. Harth, A. Bast, **J., Troidl**, B. Meulemeester, H. Pfister, J. Beyer, M. Oberlaender, H.-C. Hege, and D. Baum, "Rapid Prototyping for Coordinated Views of Multi-scale Spatial and Abstract Data: A Grammar-based Approach", in *Eurographics Workshop on Visual Computing for Biology and Medicine (VCBM)*, 2023.

[7] **J. Troidl**, S. Warchol, J. Choi, J. Matelsky, N. Dhanyasi, X. W. Wang, B. Wester, D. Wei, J. Lichtman, H. Pfister, and J. Beyer, "Vimo: Visual Analysis of Neuronal Connectivity Motifs", *IEEE Transactions on Visualization and Computer Graphics*, 2023.

[8] P. Velicky, E. Miguel, J. M. Michalska, J. Lyudchik, D. Wei, Z. Lin, J. F. Watson, **J., Troidl**, J. Beyer, Y. Ben-Simon, *et al.*, "Dense 4D nanoscale reconstruction of living brain tissue", *Nature Methods*, pp. 1–10, 2023.

[9] J. Beyer*, **J. Troidl***, S. Boorboor, M. Hadwiger, A. Kaufman, and H. Pfister, "A Survey of Visualization and Analysis in High-Resolution Connectomics", in *Computer Graphics Forum*, Wiley Online Library, vol. 41, 2022, *indicates equal contribution.*

[10] **J. Troidl**, C. Cali, E. Gröller, H. Pfister, M. Hadwiger, and J. Beyer, "Barrio: Customizable Spatial Neighborhood Analysis and Comparison for Nanoscale Brain Structures", *Computer Graphics Forum (Proceedings Eurographics/IEEE Symposium on Visualization, Eurovis 2022*, vol. 41, no. 3, 2022.

[11] P. Rautek, M. Mlejnek, J. Beyer, **J. Troidl**, H. Pfister, T. Theußl, and M. Hadwiger, "Objective Observer-Relative Flow Visualization in Curved Spaces for Unsteady 2D Geophysical Flows", *IEEE Transactions on Visualization and Computer Graphics*, 2020.

Preprints

[1] **J. Troidl**, J. Knittel, W. Li, F. Zhan, H. Pfister*, and S. Turaga*, "Global Neuron Shape Reasoning with Point Affinity Transformers", Preprint, 2024.

[2] **J. Troidl**, Y. Liang, J. Beyer, M. Tavakoli, J. Danzl, M. Hadwiger, H. Pfister, and J. Tompkin, "niiv: Fast Self-supervised Neural Implicit Isotropic Volume Reconstruction", Preprint, 2024, pp. 2024–09.

Teaching

- **(Head) Teaching Fellow** (for Extension School Students) at Harvard University   Fall 2022, 2023, 2024
  CS171 - Visualization
- **Teaching Fellow** for Professional & Executive Education at Harvard University   2023, 2024
  Data Visualization: Communicating Data and Complex Ideas Visually
- **Teaching Fellow** at TU Wien   2017 - 2020
  Medical Visualization, Intro to Visual Computing, Intro to Computer Engineering

Scholarships and Awards

- ILW Best Master Thesis Award in informatics for life sciences, German Informatics Society and German Association for Medical Informatics, Biometry and Epidemiology.   2022
- Best SciVis Paper, IEEE VIS 2020 (among the best 3 papers out of 211 accepted papers)   2020
- Scholarship, Austrian Marshall Plan Foundation   2020
- Bachelor with Honors, TU Wien (among the top 5% of CS students at TU Wien)   2020
- Short-term grant for scientific work abroad, TU Wien   2020
- Merit Based Scholarship, TU Wien   2018

References

- **Hanspeter Pfister**, An Wang Professor of Computer Science, Harvard University
  pfister@g.harvard.edu
- **James Tompkin**, Associate Professor, Brown University
  james_tompkin@brown.edu
- **Srinivas Turaga**, Group Leader, HHMI Janelia
  turagas@janelia.hhmi.org