Jakob Troidl

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About

I am a Ph.D. student in computer science at Harvard University, advised by Hanspeter Pfister. I am deeply interested in computational neuroscience, particular connectomics. My research focuses on building scalable visual analysis tool & machine-learning algorithms to analyze the hidden architecture of the brain. When I am not prototyping new ideas, I enjoy rowing, reading philosophy, hiking, or just being in nature.

Education

Harvard University — Cambridge, MA
Ph.D. in Computer Science, Advisor: Prof. Hanspeter Pfister — 2021–2027

- Focus: Computational Neuroscience, Data Visualization, Machine Learning

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

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

Publications

[1] 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", *arXiv preprint arXiv:2306.02914*, 2023.

[2] **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", in *under submission*, 2023.

[3] P. Velicky, E. Miguel, J. M. Michalska, D. Wei, Z. Lin, J. F. Watson, **J. Troidl**, J. Beyer, Y. Ben-Simon, C. Sommer, *et al.*, "Saturated reconstruction of living brain tissue", *Accepted to Nature Methods*, 2023.

[4] 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.*

[5] **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.

[6] 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.

Teaching

- **Head Teaching Fellow** for Extension School Students (DCE) at Harvard University — Fall 2022
  CS171 - Visualization
- **Teaching Fellow** at TU Wien — Fall 2020
  Selected Chapters from Medical Visualization
- **Teaching Fellow** at TU Wien — Spring 2017, Spring 2018
  Introduction to Visual Computing
- **Teaching Fellow** at TU Wien — Fall 2017
  Introduction to Computer Engineering

Skills

- **Coding:** Python, PyTorch, CUDA, Java-Script, C++
- **Tools:** GCloud, Unity, QT, CMake, Latex

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
- 6-year PhD fellowship, Harvard University — 2021
- Best SciVis Paper, IEEE VIS 2020 (among the best 3 papers out of 211 accepted papers) — 2020
- Scholarship, Austrian Marshall Plan Foundation (9.100$) — 2020
- Bachelor with Honors, TU Wien (among the top 5% of CS students at TU Wien) — 2020
- Short-term grant for scientific work abroad, TU Wien (3.100$) — 2020
- Merit Based Scholarship, TU Wien (1.000$) — 2018

Talks

- **Motif Analysis in Connectomes** at KAUST, Saudi Arabia — Spring 2023
  Seminar Talk
- **The State of the Art in Neural Rendering** at Harvard University — Spring 2023
  Seminar Talk
- **Scalable Spatial Neighborhood Analysis in Connectomes** in Rome, Italy — Summer 2022

Conference Presentation at EuroVis

- **The State of the Art in Connectome Visualization** in Rome, Italy — Summer 2022
  Conference Presentation at EuroVis
- **Visual Neuronal Motif Analysis in Connectomes** in Berlin, Germany — Summer 2022
  Poster Presentation at the International Connectomics Conference

References

- **Hanspeter Pfister**, An Wang Professor of Computer Science, Harvard University
  pfister@g.harvard.edu
- **Eduard Gröller**, Full Professor, TU Wien
  groeller@cg.tuwien.ac.at
- **Markus Hadwiger**, Full Professor, KAUST
  markus.hadwiger@kaust.edu.sa