FLORIAN BARKMANN

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EDUCATION

PhD Student at Boeva Lab, ETH Zürich — Aug. 2022 -
Data Science (M.Sc.), ETH Zürich — Oct. 2020 - July 2022
Mathematics (B.Sc), Eberhard Karls University Tübingen — Oct. 2015 - Oct. 2019
International Economics (B.Sc), Eberhard Karls University Tübingen — Oct. 2014 - Oct. 2018

PUBLICATIONS

Journal articles

[1] M. Prummer, A. Bertolini, L. Bosshard, **F. Barkmann**, J. Yates, V. Boeva, D. Stekhoven, and F. Singer. "scROSHI: robust supervised hierarchical identification of single cells". In: *NAR Genomics and Bioinformatics* 5.2 (2023).

[2] **F. Barkmann**, Y. Censor, and N. Wahl. "Superiorization of projection algorithms for linearly constrained inverse radiotherapy treatment planning". In: *Frontiers in Oncology* 13 (2023), p. 1238824.

Preprints

[3] A. Theus*, **F. Barkmann***, D. Wissel, and V. Boeva. "CancerFoundation: A single-cell RNA sequencing foundation model to decipher drug resistance in cancer". In: *bioRxiv* (2024), pp. 2024–11.

[4] M. Vandenhirtz*, **F. Barkmann***, L. Manduchi, J. E. Vogt, and V. Boeva. "scTree: Discovering Cellular Hierarchies in the Presence of Batch Effects in scRNA-seq Data". In: *arXiv preprint arXiv:2406.19300* (2024).

[5] J. Yates*, **F. Barkmann***, P. Czyz, A. Kraft, M. Glettig, F. Lohmann, E. Saquand, R. von der Horst, N. Volken, N. Beerenwinkel, et al. "CanSig: discovery of shared transcriptional states across cancer patients from single-cell RNA sequencing data". In: *bioRxiv* (2022), pp. 2022–04.

[6] L. Ciernik, A. Kraft, **F. Barkmann**, J. Yates, and V. Boeva. "ANS: Adjusted Neighborhood Scoring to improve assessment of gene signatures in single-cell RNA-seq data". In: *bioRxiv* (2023), pp. 2023–09.

* denotes shared first authorship.

CONFERENCE CONTRIBUTIONS

2024 NeurIPS 2024 Workshop: Self-Supervised Learning - Theory and Practice, Vancouver, Poster

2024 NeurIPS 2024 Workshop on AI for New Drug Modalities, Vancouver, Poster

2024 scverse conference, Munich, 2024, Poster

2024 AccMLBio workshop at ICML, Vienna, **Spotlight talk**

2024 SPIGM workshop at ICML, Vienna, Poster

2023 Single cell, systems biology and data analytics approaches to understand cellular mechanisms in development and disease, Freiburg, **Talk**

2023 Basel Computational Biology Conference (BC2), Basel, **Talk**

2023 AI + X Summit, Zürich, Poster

2022 Single Cell Genomics meets Data Science, Munich, **Talk** and Poster, **best poster award**

2021 7th Annual Loma Linda workshop on Particle Imaging and Radiation Treatment Planning, Loma Linda, **Talk**

TEACHING RESPONSABILITIES

Advanced Machine Learning, ETH Zürich — Oct. 2024 - Feb. 2025

Computational Intelligence Lab **(Head TA)**, ETH Zürich — Feb. 2024 - Oct. 2024

Advanced Machine Learning, ETH Zürich — Oct. 2023 - Feb. 2024

Computational Intelligence Lab, ETH Zürich — Feb. 2023 - Oct. 2023

Deep Learning, ETH Zürich — Oct. 2022 - Feb. 2023

Machine Perception, ETH Zürich — Feb. 2022 - Oct. 2022

SUPERVISION

2024 Alexander Theus, Master Thesis, *scCancerGPT: Understanding intratumor heterogeneity through scRNA-seq foundation models*, **Paper accepted** at NeurIPS 2024 Workshop: AIDrugX 2024

2024 Marco Baumann, Bachelor Thesis, *scDIVA: Towards domain invariant reference-query mapping*, **Poster presentation** at scverse conference 2024

2024 Fiona Muntwyler joint supervision with Imant Daunhawer, Master Thesis, *Multi-modality integration using VAEs*

2024 Olga Ovcharenko joint supervision with Imant Daunhawer, Master Thesis, *Self-Supervised contrastive Learning for spatial transcriptomics data*, **Paper accepted** to NeurIPS 2024 Workshop: Self-Supervised Learning 2024

2023 Philip Toma, Master Thesis, *Regularized Self-Supervised Learning from Nearest Neighbors to Integrate scRNA-seq Experiments*, **Paper accepted** to NeurIPS 2024 Workshop: Self-Supervised Learning 2024

2023 Leander Diaz-Bone, Bachelor Thesis, *VAEs with Learnable Priors for Learning a Robust Latent Space Representation of Single-Cell RNA Sequencing Data*, **Poster presentation** at Single cell, systems biology and data analytics conference in Freiburg 2023

EXPERIENCE

German Cancer Research Center — Feb. 2020 - July 2020
Research intern hosted by Niklas Wahl — *Heidelberg, Germany*

- Implemented and tested an optimizer for high dimensional, constrained optimization problems with applications in radiation therapy.

German Climate Computing Center — Oct. 2019 - Feb. 2020
Intern — *Hamburg, Germany*

- Developed a local testing environment for the cluster using Docker.
- Implemented a tool to automate visualizations of climate simulations with ParaView and Python.

OTHER ACTIVITIES

Reviewer for *Bioinformatics*(2022), *NeurIPS Workshop AIDrugX* (2024), Cancer Discovery (2024)

Co-organizer of quarterly meetings for all bioinformatics groups from ETH Zürich and the University of Zürich — Oct. 2022 - Oct. 2023

Semester abroad at the University of Hong Kong — Oct. 2016 - Dec. 2016

Volunteering at a school in San José, Costa Rica — Aug. 2013 - Aug. 2014