

FLORIAN BARKMANN

✉ flobarkmann@gmail.com ♦ [florianbarkmann.github.io](https://github.com/florianbarkmann)

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

EXPERIENCE

German Cancer Research Center Research intern hosted by Niklas Wahl	Feb. 2020 - July 2020 <i>Heidelberg, Germany</i>
<ul style="list-style-type: none">Implemented and tested an optimizer for high dimensional, constrained optimization problems with applications in radiation therapy.	
German Climate Computing Center Intern	Oct. 2019 - Feb. 2020 <i>Hamburg, Germany</i>
<ul style="list-style-type: none">Developed a local testing environment for the cluster using Docker.Implemented a tool to automate visualizations of climate simulations with ParaView and Python.	

PUBLICATIONS

Proceedings

- 2025 **scSSL-Bench: Benchmarking Self-Supervised Learning for Single-Cell Data**
O. Ovcharenko*, **F. Barkmann***, P. Toma*, I. Daunhawer, J. E. Vogt, S. Schelter, and V. Boeva
Spotlight at ICML (2025)

Journal articles

- 2023 **scROSHI: robust supervised hierarchical identification of single cells**
M. Prummer, A. Bertolini, L. Bosshard, **F. Barkmann**, J. Yates, V. Boeva, D. Stekhoven, and F. Singer
NAR Genomics and Bioinformatics
- 2023 **Superiorization of projection algorithms for linearly constrained inverse radiotherapy treatment planning**
F. Barkmann, Y. Censor, and N. Wahl
Frontiers in Oncology

Peer-reviewed workshop papers

- 2024 **CancerFoundation: A single-cell RNA sequencing foundation model to decipher drug resistance in cancer**
A. Theus*, **F. Barkmann***, D. Wissel, and V. Boeva
AIDrugX workshop at NeurIPS (2024)
- 2024 **scTree: Discovering Cellular Hierarchies in the Presence of Batch Effects in scRNA-seq Data**
M. Vandenhirtz*, **F. Barkmann***, L. Manduchi, J. E. Vogt, and V. Boeva
Spotlight at AccMLBio workshop at ICML (2024) & SPIGM workshop at ICML (2024)

Preprints

- 2025 **CanSig: a tool for benchmarking malignant state discovery in single-cell RNA-Seq data**
F. Barkmann*, J. Yates*, P. Czyz, A. Kraft, M. Glettig, F. Lohmann, E. Saquand, R. von der Horst, N. Volken, N. Beerenwinkel, et al.
Under review at Cancer Research
- 2025 **CDState: an unsupervised approach to predict malignant cell heterogeneity in tumor bulk RNA-sequencing data**
A. Kraft, J. Yates, F. Barkmann, and V. Boeva
bioRxiv
- 2023 **ANS: Adjusted Neighborhood Scoring to improve assessment of gene signatures in single-cell RNA-seq data**
L. Ciernik, A. Kraft, F. Barkmann, J. Yates, and V. Boeva
bioRxiv

* denotes shared first authorship.

CONFERENCE CONTRIBUTIONS

- 2024 AccMLBio workshop at ICML, Vienna, **Spotlight talk**
- 2023 Single cell, systems biology and data analytics approaches to understand cellular mechanisms in development and disease, Freiburg, **Contributed talk**
- 2023 Basel Computational Biology Conference (BC2), Basel, **Contributed talk**
- 2022 Single Cell Genomics meets Data Science, Munich, **Contributed talk, best poster award**
- 2021 7th Annual Loma Linda workshop on Particle Imaging and Radiation Treatment Planning, Loma Linda, **Contributed talk**

TEACHING RESPONSABILITIES

Computational Intelligence Lab (Head TA), ETH Zürich	Feb. 2025 - Oct. 2025
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

- 2025 Flavia Pedrocchi, Master Thesis, *Interpretable Features in Single-Cell Foundation Models via Sparse Autoencoders* (current)
- 2025 Katya Tubis, Research intern, *Delta Tuning Methods for parameter efficient fine-tuning of Single-Cell Foundation Models* (current)
- 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

OTHER ACTIVITIES

- Reviewer for *MLGenX @ICLR* (2025) *Cancer Discovery* (2024), *AIDrugX @NeurIPS* (2024), *Bioinformatics*(2022)
- Co-organizer of quarterly meetings for all bioinformatics groups from ETH Zürich Oct. 2022 - Oct. 2023
and the University of Zürich
- 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