

Curriculum Vitae of Farzin Soleymani

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EDUCATION	<ul style="list-style-type: none">◇ Ph.D. in Computational Biology 2022 - now Helmholtz Munich and Technical University of Munich, Munich, Germany◇ M.Sc. in Electrical and Computer Engineering 2021 Technical University of Munich, Munich, Germany◇ B.Sc. in Computer Engineering 2016 Sharif University of Technology, Tehran, Iran
RESEARCH EXPERIENCE	<ul style="list-style-type: none">◇ Research Assistant, Helmholtz Munich, and TU Munich 06/2022 - now<ul style="list-style-type: none">· Multi-Modal AI for Structural Biology: Developed a multi-modal framework based on large protein language models (ESM2 and ESM3) and graph neural networks (GNN) to create accurate protein binding site probability maps.· Higher-Order Information for GNNs: Developed a novel topology-aware GNN model to capture higher-order information through persistent homology and clique graphs.· 3D Protein Pose Estimation and Mapping: Implemented a framework for protein pose estimation and mapping using point cloud representations and optimal transport (OT) to align 3D density maps of protein structures.Supervisors: Dr. Benjamin Schubert, Institute of Computational Biology & Prof. Bastian Rieck, University of Fribourg.◇ Research Assistant, LMU Munich, and Munich Center for Machine Learning 11/2020 - 11/2021<ul style="list-style-type: none">· Self-supervised Learning Using Bergman Divergence: Developed a novel self-supervised learning framework for visual representation using deep functional Bregman divergences, enabling divergence measurement beyond traditional Euclidean metrics, and capturing differences between data distributions.· Unsupervised Learning with Self-labeling for Biomedical Imaging: Implemented a Deep Variational Clustering (DVC) framework for unsupervised representation learning and clustering with self-labeling on large-scale medical imaging datasets.· Uncertainty Quantification for Biomedical Imaging: Developed an uncertainty quantification framework for biomedical imaging utilizing an uncertainty-aware progressive GAN structure to enhance reliability and accuracy.Supervisors: Dr. Mina Rezaei & Prof. Bernd Bischl, Department of Statistics◇ Research Internship, Helmholtz Munich 01/2020 - 04/2020<ul style="list-style-type: none">· Unsupervised Learning for Single-cell Genomics: Built an end-to-end pipeline for integration, annotation, and visualization of single-cell RNA-seq data across multiple tissues.Supervisors: Dr. Mo Lotfollahi, Prof. Fabian Theis, Institute of Computational Biology.◇ Research Assistant, Sharif University of Technology 10/2015 - 12/2016<ul style="list-style-type: none">· Bayesian Modeling of Genomic Data: Developed and applied Bayesian models to analyze population-structured data, leveraging prior knowledge to capture complex associations within heterogeneous groups.Supervisor: Prof. Abolfazl Motahari, Bioinformatics Research Lab.
PUBLICATIONS	<ul style="list-style-type: none">◇ [Conference Paper] (*Equal Contribution) Davide Buffelli*, Farzin Soleymani*, Bastian Rieck, “CliquePH: Higher-Order Information for Graph Neural Networks through Persistent Homology on Clique Graphs”, Proceedings of Machine Learning Research (PMLR) 269, 2024.◇ [Journal Paper] (*Equal Contribution) Mina Rezaei*, Farzin Soleymani*, Shekoofeh Azizi, Bernd Bischl, “Deep Bregman Divergence for Contrastive Learning of Visual Representations”, Computer Vision and Image Understanding, Volume 235, 2023.◇ [Conference Paper] Farzin Soleymani, Mina Rezaei, Mohammad Eslami, Tobias Elze, Bernd Bischl, “Deep Variational Clustering Framework for Self-labeling Large-scale Medical Images”, Medical Imaging: Image Processing, 2022. [Nominated for the best student award].

RESEARCH INTERESTS	<ul style="list-style-type: none"> ◇ Machine Learning/Deep Learning ◇ Geometric Deep Learning ◇ Uncertainty Quantification ◇ Generative AI ◇ Self-Supervised Learning ◇ Computer Vision/Medical Imaging 	
HONORS AND AWARDS	<ul style="list-style-type: none"> ◇ Admission to Technical University of Munich 2017 Technical University of Munich is the best and the most prestigious university in Germany. ◇ Admission to Sharif University of Technology 2011 Sharif University of Technology is the best university in Iran. Admission to Sharif is limited to the very top students in the nationwide entrance examination. 	
TEACHING EXPERIENCE	<ul style="list-style-type: none"> ◇ Teaching Assistant of C/C++ Programming Module 2012 ◇ Teaching Assistant of Electrical Circuits Module 2013, 2014 ◇ Teaching Assistant of Signals and Systems Module 2013 ◇ Teaching Assistant of Computer Structure & Language Module 2014, 2015 ◇ Teaching Assistant of Digital Electronics Module 2014, 2015 	
SCIENTIFIC ACTIVITIES	<ul style="list-style-type: none"> ◇ Kaggle Challenge, Carcinoma Classification, OxML Challenge, 2023 Implemented augmentation methods to address class imbalance and applied an ensemble of pretrained ResNet50 models to classify H&E-stained histopathological slices. ◇ DRAC22 Challenge, Diabetic Retinopathy Analysis Challenge, MICCAI, 2022 Applied the Barlow Twins method in the pretraining phase to extract embeddings, and utilised segmentation and classification heads to generate the final output. ◇ QUBIQ Challenge, Quantification of Uncertainties Challenge, MICCAI, 2021 Developed an uncertainty quantification framework for biomedical imaging utilizing an uncertainty-aware progressive GAN structure to enhance reliability and accuracy. ◇ Technical Staff, 15th Asia Regional ICPC/ACM Contest in 2013, Tehran Served as a member of the technical committee, and was responsible for resolving technical and scientific problems during the contest. ◇ SUT Python Challenge, Qualified to the final stage in 2014 and 2015, Tehran Participated in the annual Python Challenge at Sharif University of Technology, a competitive group contest focused on advancing skills in Python programming and AI concepts. 	
TECHNICAL SKILLS	<ul style="list-style-type: none"> ◇ Programming: Python, SQL, MATLAB, C/C++. ◇ Machine Learning: PyTorch, PyTorch Lightning, PyG (PyTorch Geometric), Scanpy, Scikit-learn, Hyperopt, Hugging Face, XGBoost, OpenCV, Pandas, NumPy, SciPy, Slurm, Bash Scripting. ◇ Data Visualization: Matplotlib/Seaborn, Weights & Biases, TensorBoard. ◇ Version Control: GitHub, Git. 	
SOFT SKILLS	<ul style="list-style-type: none"> ◇ Self-motivated, Problem solver, Strategic planer, Team-worker. 	
LANGUAGES	<ul style="list-style-type: none"> ◇ English (Fluent), German (Intermediate), Persian (Native). 	
REFERENCES	<ul style="list-style-type: none"> ◇ Dr. Shekoofeh Azizi (Google DeepMind), Prof. Bernd Bischl (Ludwig Maximilian University of Munich), Dr. Mohammad Eslami (Harvard University), Dr. Mo Lotfollahi (Cambridge University and Welcome Sanger institute), Dr. Mina Rezaei (Ludwig Maximilian University of Munich), Prof. Bastian Rieck (University of Fribourg), and Dr. Benjamin Schubert (Helmholtz Munich). 	