

Pakshal Bohra

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Summary

ML Research Engineer with a PhD from EPFL, combining expertise in generative models and computational imaging with hands-on industry experience in fine-tuning foundation models and deploying them on edge devices.

Experience

ML Research Engineer, Distran AG – Zurich, Switzerland Jan 2026 – Present

- Leading the end-to-end development of a real-time multimodal ML system for advanced scene understanding on Distran’s ultrasonic cameras, spanning dataset curation and preparation, fine-tuning of foundation models, and optimized edge deployment

Computational Software Engineer, Distran AG – Zurich, Switzerland Aug 2024 – Dec 2025

- Co-developed DeepRange, an acoustic imaging algorithm shipped on Distran’s cameras that enables detection of gas leaks 5x fainter than previously possible in typical industrial environments
- Designed and implemented DVC-backed ML pipelines for the complete development cycle of trustworthy leak quantification models
- Built a production-grade internal semantic search engine based on vision-language models for text-based image retrieval, replacing manual search workflows
- Core contributor of high-performance signal processing and acoustic imaging pipelines to Distran’s JAX-based scientific computing SDK for rapid algorithm prototyping and large-scale data reprocessing

Research Assistant, EPFL – Lausanne, Switzerland Sep 2018 – Jun 2024

- Developed state-of-the-art algorithms based on deep generative models for image and video reconstruction from incomplete noisy measurements in computational quantitative phase imaging
- Introduced a scalable PyTorch framework for efficiently learning activation functions in deep neural networks, enabling provably robust and stable solutions for inverse problems in imaging
- Built a statistical benchmarking toolkit for deep-learning-based solutions to inverse problems, leveraging MCMC posterior samplers as gold-standard references for optimality evaluation
- Proposed a neural-network-based convex regularizer for fast and interpretable image reconstruction, and applied it to MRI and CT imaging
- Published 11 peer-reviewed papers (7 as first author); presented technical tutorials at SIAM-IS and IEEE ISBI on Bayesian Inference for Inverse Problems
- Supervised 13 student research projects (master’s theses, internships, and semester projects); served as Teaching Assistant for Image Processing I and II

Graduate Student Researcher, IIT Bombay – Mumbai, India Jun 2017 – Jun 2018

- Developed sparsity-driven algorithms for compressed sensing under Poisson and Poisson-Gaussian noise, with provable performance guarantees; published two first-author peer-reviewed papers

Research Intern, Siemens Healthineers – Bengaluru, India

May 2016 – Jul 2016

- Developed an algorithm based on supervoxel features, random forest classifiers and the graph cuts method for the automated segmentation of the spleen in CT images

Education

PhD in Electrical Engineering, EPFL – Lausanne, Switzerland

Sep 2018 – Jun 2024

- Research Areas: Deep Learning, Computational Imaging, Statistics
- Advisor: Prof. Michael Unser

B.Tech + M.Tech in Electrical Engineering, IIT Bombay – Mumbai, India

Jul 2013 – Jun 2018

- Minor in Computer Science and Engineering

Technical Skills

Languages: Python, C++, Java

Machine Learning: PyTorch, JAX, Equinox, Hugging Face (Transformers, Diffusers, PEFT, Accelerate), TensorRT, XGBoost, scikit-learn

Computer Vision: OpenCV, scikit-image, FFmpeg

Data Processing and Analysis: NumPy, SciPy, pandas, polars

Data Visualization & UI: matplotlib, seaborn, plotly, Streamlit

Dev/ML Ops & Infrastructure: Google Cloud Platform (GCP), Git, DVC, MLflow, Docker, Jenkins

Selected Publications

* denotes equal contribution

- **P. Bohra**^{*}, J. Campos^{*}, H. Gupta, S. Aziznejad, and M. Unser, “[Learning Activation Functions in Deep \(Spline\) Neural Networks](#)”, *IEEE Open Journal of Signal Processing*, 2020
- **P. Bohra**, T. -a. Pham, J. Dong, and M. Unser, “[Bayesian Inversion for Nonlinear Imaging Models Using Deep Generative Priors](#)”, *IEEE Transactions on Computational Imaging*, 2022
- **P. Bohra**^{*}, T. -a. Pham^{*}, Y. Long, J. Yoo, and M. Unser, “[Dynamic Fourier Ptychography With Deep Spatiotemporal Priors](#)”, *Inverse Problems*, 2023
- **P. Bohra**, D. Perdios, A. Goujon, S. Emery, and M. Unser, “[Learning Lipschitz-Controlled Activation Functions in Neural Networks for Plug-and-Play Image Reconstruction Methods](#)”, *NeurIPS Workshop on Deep Learning and Inverse Problems*, 2021
- **P. Bohra**, P. del Aguila Pla, J. -F. Giovannelli, and M. Unser, “[A Statistical Framework To Investigate the Optimality of Signal-Reconstruction Methods](#)”, *IEEE Transactions on Signal Processing*, 2023
- A. Goujon, S. Neumayer, **P. Bohra**, S. Ducotterd, and M. Unser, “[A Neural-Network-Based Convex Regularizer for Inverse Problems](#)”, *IEEE Transactions on Computational Imaging*, 2023
- S. Ducotterd, A. Goujon, **P. Bohra**, D. Perdios, S. Neumayer, and M. Unser, “[Improving Lipschitz-Constrained Neural Networks by Learning Activation Functions](#)”, *Journal of Machine Learning Research*, 2024
- R. Parhi, **P. Bohra**, A. El Biari, M. Pourya, and M. Unser, “[Random ReLU Neural Networks as Non-Gaussian Processes](#)”, *Journal of Machine Learning Research*, 2025