Robert Bamler

Generative AI and Machine Learning Researcher and Developer

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Principal AI/ML researcher with 10+ years of experience in generative AI, model quantization and compression, probabilistic inference, and AI for science. Former university professor with >1,600 citations, EUR 1.2M in acquired funding, and a proven track record of transitioning research into patented industry applications (Disney Imagineering, Nokia).

My technical edge: I am passionate about deriving efficient algorithms and performant AI systems from a deep understanding of the mathematical models and computational constraints.

Experience

Principal Researcher

Nokia TECH, Visual AI Systems Research

📅 11/2025 – present   📍 Munich, Germany

- **Note:** Nokia announced a site closure shortly after I joined.
- **Immediate impact & standardization:** inventing novel methods for AI model compression and AI-aided video compression for standardization within international bodies like MPEG and JVET.
- **Longer term vision:** architecting the next generation of LLM inference acceleration, focusing on overcoming the bandwidth bottleneck on accelerator hardware using an applied information-theoretical approach.

Professor of Machine Learning and Data Science

University of Tübingen & Tübingen AI Center

📅 11/2020 – 10/2025   📍 Tübingen, Germany

- **Strategic research leadership & mentoring:** founded and directed a research group specialized in AI/ML and managed a portfolio of research projects across 9 researchers (5 PhD, 2 MSc, 2 BSc candidates).
- **Grant acquisition & resource management:** secured EUR 1.2M (USD 1.4M) in highly competitive third-party funding via the Emmy Noether grant.
- **High-impact publication record:** published in top venues including NeurIPS, ICML, and ICLR, contributing to a total citation count of >1,600.
- **Curriculum innovation:** pioneered a popular university course on AI-based data compression, bridging the gap between information theory and practical applications of generative modeling.

Postdoctoral Research Associate

University of California at Irvine

📅 12/2018 – 10/2020   📍 Irvine, CA

- **High-impact research:** including publications at NeurIPS, ICML & ICLR.
- **Mentoring:** co-advised 2 PhD students and 1 intern in the machine-learning research group of Prof. Stephan Mandt & helped with teaching.
- **Grant acquisition:** helped drafting and successfully defending a DARPA grant and an NSF Small Grant.

Postdoctoral Research Associate

Disney Research & Development, Walt Disney Imagineering

📅 09/2016 – 12/2018   📍 Pittsburgh, PA ('16–'17) & Los Angeles ('18)

- **Applied AI/ML research:** developed AI systems and machine-learning models and algorithms for proprietary applications in theme parks and TV shows, and for IP portfolio expansion (US Patent 11,068,658 B2).
- **Cross-functional AI strategy:** advised other business units on AI/ML.
- **Academic outreach & employer branding:** published original research at top-tier venues (NeurIPS, ICML) to advertise Disney as an employer.

Skills

Specializations:
Generative AI ● probabilistic generative models ● model quantization & compression ● inference acceleration ● AI for science

Frameworks & programming languages:
PyTorch ● TensorFlow ● transformers ● CUDA ● Python ● Rust ● C++

Leadership & strategy:
Detecting emerging opportunities ● team coordination ● career mentoring ● technical writing ● grant acquisition

Goals

My goal is to work on challenging applied AI/ML problems with a team of experts that help each other overcome obstacles. I am seeking a position where I can also apply my broad experience in the AI/ML space to help identify new opportunities for my employer.

Education

- **PhD in Theoretical Physics**   📅 07/2016
  University of Cologne, Germany
  (Field: statistical many-body theory; advisor: Prof. Dr. Achim Rosch)

- **Diploma in Physics**   📅 12/2011
  Technical University of Munich, Germany
  (German equivalent to an MSc back then; required to enter a PhD program)

- **Exchange student**   📅 09/2008 – 07/2009
  Universidad de Granada, Spain

- **Intermediate Diploma in Physics**   📅 11/2007
  Technical University of Munich, Germany
  (German equivalent to a BSc back then)

References

- **Prof. Stephan Mandt**, Associate Professor, University of California at Irvine; mandt@uci.edu
  Relationship: my supervisor at Disney Research and UC Irvine (09/2016–10/2020).

- **Hamed Rezazadegan Tavakoli**, Head of Visual AI Systems Research at Nokia; hamed.rezazadegan_tavakoli@nokia.com
  Relationship: my current supervisor.

Selected Publications

For a full list, please see Google Scholar; most papers contain a link to a Github repository with the code.

Generative AI and LLMs

A. Zhang, T. Z. Xiao, W. Liu, **R. Bamler**, and D. Wischik,
Your Finetuned Large Language Model is Already a Powerful Out-of-distribution Detector,
AISTATS 2025

J. Zenn and **R. Bamler**,
Differentiable Annealed Importance Sampling Minimizes The Jensen-Shannon Divergence Between Initial and Target Distribution,
ICML 2024

Bayesian Deep Learning

T. Cinquin, M. Pförtner, V. Fortuin, P. Hennig, and **R. Bamler**,
FSP-Laplace: Function-Space Priors for the Laplace Approximation in Bayesian Deep Learning,
NeurIPS 2024

T. Cinquin and **R. Bamler**,
Well-Defined Function-Space Variational Inference in Bayesian Neural Networks via Regularized KL-Divergence,
UAI 2025

Compression of AI Models & AI-Based Data Compression

Y. Yang, **R. Bamler**, and S. Mandt,
Variational Bayesian Quantization,
ICML 2020

Y. Yang, **R. Bamler**, and S. Mandt
Improving Inference for Neural Image Compression,
NeurIPS 2020

AI for Natural Sciences

J. Zenn, D. Gond, F. Jirasek, and **R. Bamler**,
Balancing Molecular Information and Empirical Data in the Prediction of Physico-Chemical Properties,
Digital Discovery, 2025

F. Jirasek, **R. Bamler**, and S. Mandt,
Hybridizing physical and data-driven prediction methods for physicochemical properties,
Chemical Communications, 2020

Scalable Bayesian Inference

R. Bamler, C. Zhang, M. Opper, S. Mandt,
Perturbative Black Box Variational Inference,
NeurIPS 2017

R. Bamler and S. Mandt,
Improving Optimization in Models With Continuous Symmetry Breaking,
ICML 2018

Selected Open Source Contributions

Own project I am most proud of: `constriction` (`https://bamler-lab.github.io/constriction`)
Rust and Python library of high-performance building blocks for AI-based data and model compression.

Merged contributions to a third-party project that I am currently most excited about: `wgpu`
`https://github.com/gfx-rs/wgpu/pulls?q=author%3Arobamler`
Contributions: Implemented several new features into mozilla's compiler for WebGPU compute shaders, which were needed to run my custom experimental GPU kernels for compressed neural networks on consumer GPUs.