

Robert Bamler

Generative AI and Machine Learning Researcher and Developer

✉ robert.bamler@gmail.com
🔗 Google Scholar

🌐 robamler.github.io
🔗 robamler

🌐 robert-bamler
🔗 @robamler



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 and implementing 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;
Relationship: my supervisor at Disney Research and UC Irvine (09/2016–10/2020).
- **Hamed Rezazadegan Tavakoli**, Head of Visual AI Systems Research at Nokia;
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. Oppel, 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) (<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 large third-party code base that I am currently most excited about:** [wgpu](https://github.com/gfx-rs/wgpu/pulls?q=author%3Arobamler)
<https://github.com/gfx-rs/wgpu/pulls?q=author%3Arobamler>
My contributions: I implemented several new features into mozilla's WebGPU compiler (used in Firefox), which were needed to run my custom experimental GPU kernels for compressed neural networks on consumer GPUs.