

Manuel Bärenz

Software engineer, mathematician, physicist

Strengths

- Haskell, functional programming
- High quality software engineering
- Research in mathematics, physics, and computer science
- Knowledge communication

Career

- 2023 **Open Source Fellow**, *Tweag*
Stochastic modelling, probabilistic programming, authored reactive Bayesian machine learning library **rhine-bayes**
- Since 2018 **Software Engineer**, *Virtual Power Plant*, sonnen, Berlin
- Battery modelling, optimization algorithms, controlling
 - Online data analysis, machine learning
 - Supervision of Master's and Bachelor's theses
- 2017 – 2018 **PostDoc**, *Mathematics Department*, Universität Wien, with Prof. Nils Carqueville
- 2015 – 2017 **Teaching Assistant**, *Department „Foundations of Computer Science“*, Universität Bamberg, with Prof. Michael Mendler
- Supervision of student projects in Haskell
 - Courses in functional programming
- 2013 – 2016 **PhD**, *Institute for Mathematical Sciences, University of Nottingham*, Supervisor: Prof. John W. Barrett
Thesis Title: „Topological state sum models in four dimensions, half-twists and their applications“
- 2011 – 2012 **Master's degree in Mathematical Physics**, *Mathematical Institute, University of Cambridge*, Master of Advanced Studies, Merit
- 2008 – 2011 **Bachelor's degree in Physics**, *Universität Heidelberg*, Bachelor of Science, 1.0 (top grade)
- 1994 – 2007 **Primary education**, *Helmholtz-Gymnasium, Landhaus-Grundschule*, Heidelberg, Abitur, 1.1
Prizes in maths and physics competitions, Scholarship of the German National Academic Foundation

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Qualifications

Expert programming skills

Languages	Haskell, Rust, Elixir
Skills	Functional Reactive Programming, Data Analysis, Machine Learning, Modelling, Simulation, Controlling
Topics	Renewable Energies, Photovoltaic, Battery Storage, Electric Vehicle Charging, IoT, Virtual Power Plants
Tools	Nix/NixOS, Linux, Git, Gitlab CI, Github CI
Broader Experience	Python, PyMC, Phoenix, Agda, Idris, Cockroach, Cassandra, AWS, ELK

Languages

German	Native speaker
English	Business fluent, C2
Spanish	Fluent, B2

Publications

- 2023 **„Evaluating TQFT invariants from G -crossed braided spherical fusion categories via Kirby diagrams with 3-handles“**, *To appear in Quantum Topology*
- 2019 **„Essence of Live Coding: Change the Program, Keep the State“**, *Haskell Symposium*
- 2018 **„Rhine: Functional Reactive Programming with Type-Level Clocks“**, *Haskell Symposium*, with Ivan Perez
- 2017 **„Dichromatic state sum models for four-manifolds from pivotal functors“**, *Communications in Mathematical Physics*, with J. W. Barrett
- 2016 **„Functional Reactive Programming, Refactored“**, *Haskell Symposium*, with Ivan Perez and Henrik Nilsson

Voluntary services and hobbies

- Extensive authorship, maintainership and contributions in open source projects in Haskell, NixOS, Elixir and Rust
- Reviews for scientific journals and conferences
- Teaching, presentation, and thesis supervision in computer science and physics; co-organization of Berlin Haskell User Group
- Piano, choir, composing, singing, improvisational theater, bouldering, biking, gardening, apple tree care

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