



# Dmitry Bagaev, PhD — Short CV

Senior Software Engineer & Scientist

[bvdmritri.me](http://bvdmritri.me)

[bvdmritri@gmail.com](mailto:bvdmritri@gmail.com)

[linkedin.com/in/bvdmritri](https://linkedin.com/in/bvdmritri)

[github.com/bvdmritri](https://github.com/bvdmritri)

English · Dutch · Russian

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Senior software engineer and PhD scientist with a strong mathematical foundation and expertise in software development, machine learning and data science. Brings a unique blend of academic rigor and hands-on industry experience, with a proven track record of leading technical teams, architecting complex systems, and translating cutting-edge research into practical applications.

This is a condensed version of the CV — only titles and key highlights are included. For the full version with detailed descriptions, bullet points, and skills per role, please visit [bvdmritri.me/export](http://bvdmritri.me/export).

## TECHNICAL SKILLS

**Domains & Fields:** Machine Learning · Data Science · Software Development · HPC · Cloud Infrastructure · Full-stack Development · API Development · System Design · Signal Processing · Probabilistic Programming · Bayesian Inference · Reactive Programming · Applied AI · Academic Research · Mobility & Transport

**Technical Skills & Tools:** Software Architecture · API Architecture · API Design · Architect · Parallel Computing · MPI · Slurm · GitHub · Git · Linux · Docker · CI/CD · Google Cloud Platform · SQL · Observability · UI/UX · Open Source Maintenance · Code Review · Release Management

**Soft Skills & Management:** Team Leadership · Technical Leadership · Students Supervision · Mentorship · Time Management · Community Building · Community Management · Developer Relations · Event Organization · Public Speaking · Project Management · Presentational Skills · Technical Writing · Documentation

**Programming Languages:** Julia · Python · C · C++ · Fortran · JavaScript · TypeScript · Java · Scala

## WORK EXPERIENCE

**PostDoc Researcher**— TU/e, BIASlab · 2026 – Present · Eindhoven, the Netherlands  
Conducting research at Eindhoven University of Technology on fast and scalable Bayesian inference.

**Open-Source Maintainer**— Open Source · 2023 – Present · GitHub  
Founded and lead ReactiveBayes, a GitHub organization dedicated to high-performance, reactive tools for Bayesian inference and probabilistic programming.

**Chief Technology Officer**— Lazy Dynamics · 2023 – December 2025 · Eindhoven, the Netherlands  
Co-founded Lazy Dynamics, a startup focused on transforming uncertainty into actionable insights through cutting-edge Probabilistic AI Solutions for enterprise applications.

**Eindhoven Events Co-Organizer**— JuliaLang & PyData Eindhoven · August 2022 – Present · Eindhoven, the Netherlands  
Co-organize public events and meetups for the Julia and Python communities in Eindhoven, fostering local developer engagement and knowledge sharing.

**PhD Researcher**— TU/e, BIASlab · 2019 – 2025 · Eindhoven, the Netherlands  
Conducted research on novel reactive message-passing frameworks for Bayesian inference.

**Software Engineering Intern**— ExxonMobil · 1 month in 2017, 1 month in 2018 – 2018 · Houston, Texas, USA  
Completed two summer internships at ExxonMobil's headquarters, focusing on the integration of advanced numerical linear solvers into large-scale simulation software.

**Software Engineer**— Shemyakin and Ovchinnikov Institute of Bioorganic Chemistry RAS · 2015 – 2019 · Moscow, Russia  
Developed VDJdb, a curated database of T-cell receptor (TCR) sequences with known antigen specificities.

## EDUCATION

**PhD & PostDoc in Electrical Engineering**— Technical University of Eindhoven · October 2019 – Present · Eindhoven, the Netherlands  
Completed PhD in December 2023 with research focused on message-passing based Bayesian inference techniques for large-scale signal processing problems.

**Nordic Probabilistic AI School 2022**  
— The University of Helsinki, Finnish Center for Artificial Intelligence (FCAI) · June 13, 2022 – June 17, 2022 · Helsinki, Finland  
ProbAI 2022 was the third Nordic Probabilistic AI School, held June 13–17, 2022, at the University of Helsinki, Finland, bringing together 150+ participants for in-person training in probabilistic machine learning.

**Master of Science**— Moscow State University · 2017 – 2019 · Moscow, Russia  
Focused on advanced software development methodologies, distributed systems, and machine learning applications.

**Rome-Moscow School**— Moscow State University & Tor Vergata University · July 28, 2018 – September 23, 2018 · Moscow, Russia & Rome, Italy  
The main purpose of the School is to encourage the ideas exchange and scientific collaborations between Italian and Russian universities and institutions, in the fields of matrix methods and applied linear algebra.

**Institute of Numerical Mathematics RAS**— Institute of Numerical Mathematics · 2015 – 2019 · Moscow, Russia  
Conducted concurrent research at the Institute of Numerical Mathematics of the Russian Academy of Sciences, overlapping with both bachelor's and master's studies at Moscow State University.

**Institute of Bioorganic Chemistry RAS**— Institute of Bioorganic Chemistry · 2015 – 2019 · Moscow, Russia

Contributed to a collaborative research project developing VDJdb, a curated database of T-cell receptor (TCR) sequences with known antigen specificities.

**Rome-Moscow School**— MSU & Tor Vergata University · August 20, 2016 – September 3, 2016 · Rome, Italy

The main purpose of the School is to encourage the ideas exchange and scientific collaborations between Italian and Russian universities and institutions, in the fields of matrix methods and applied linear algebra.

**Bachelor of Science**— Moscow State University · 2013 – 2017 · Moscow, Russia

Moscow State University ranks among Russia's premier institutions, with the Faculty of Computational Mathematics and Cybernetics being one of its most distinguished departments, specializing in computational mathematics and cybernetics development.

**AESC MSU (Kolmogorov Boarding School)**— AESC MSU · 2011 – 2013 · Moscow, Russia

AESC MSU is a prestigious boarding school affiliated with Moscow State University, consistently ranked among Russia's top educational institutions and frequently achieving first place in national school rankings.

## SOFTWARE PROJECTS

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**RxInfer.jl**— Initially Personal Project, now under ReactiveBayes Organization

A comprehensive Julia package for automatic Bayesian inference on factor graphs with reactive message passing.

**Rocket.jl**— Initially Personal Project, now under ReactiveBayes Organization

An efficient reactive programming implementation in Julia language.

**VDJdb**— VDJdb Project

A web application for browsing and querying database of T-cell receptor (TCR) sequences with known antigen specificities.

**VDJviz**— VDJviz Project

A versatile immune repertoire web-based graphical user interface application that allows browsing and analyzing immune repertoire sequencing (RepSeq) data with comprehensive visualization capabilities.

**Other**— GitHub

Sometimes I just have an idea and want to build some simple package that I typically share with the others on GitHub or collaborate with other people.

## OPEN SOURCE CONTRIBUTIONS

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**Julia Programming Language**— JuliaLang Organization

Active contributions to the Julia programming language core and its ecosystem, including bug fixes, feature implementations, and community support.

**vdjtools**— vdjtools Project

Contributions to a comprehensive analysis framework for T-cell and B-cell repertoire sequencing data, supporting advanced immunological research.

**Angular Framework**— Angular Team

Contributions to the Google Angular ecosystem, including issue reports, feature requests, and community engagement.

**Neovim**— Neovim Project

Contributions to the Neovim ecosystem, including issue reports, feature suggestions, and community support for the modern Vim editor.

**INMOST**— INMOST Development

Contributions to INMOST, a high-performance numerical library for large-scale scientific computing and reservoir simulation.

## PUBLICATIONS

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**2778+**  
Citations

**13**  
h-index

**14**  
i10-index

**30+**  
Publications

**Reactive Probabilistic Programming for Scalable Bayesian Inference**— 2023

**VDJdb in the pandemic era: a compendium of T cell receptors specific for SARS-CoV-2**— 2022 · 259+ citations

**VDJtools: unifying post-analysis of T cell receptor repertoires**— 2015 · 712+ citations

**VDJdb: a curated database of T-cell receptor sequences with known antigen specificity**— 2018 · 692+ citations

**VDJdb in 2019: database extension, new analysis infrastructure and a T-cell receptor motif compendium**— 2020 · 478+ citations

**SARS-CoV-2 epitopes are recognized by a public and diverse repertoire of human T cell receptors**— 2020 · 297+ citations

**MAGERI: Computational pipeline for molecular-barcoded targeted resequencing**— 2017 · 65+ citations

**Exploring the pre-immune landscape of antigen-specific T cells**— 2018 · 52+ citations

**VDJviz: a versatile browser for immunogenomics data**— 2016 · 50+ citations

**Variational message passing and local constraint manipulation in factor graphs**— 2021 · 41+ citations

**RxInfer: A Julia package for reactive real-time Bayesian inference**— 2023 · 33+ citations

**Improving parallel efficiency of a complex hydrogeological problem simulation in GeRa**— 2019 · 16+ citations

**Reactive message passing for scalable Bayesian inference**— 2023 · 16+ citations

**Dynamic optimization of linear solver parameters in mathematical modelling of unsteady processes**— 2017 · 10+ citations

**Multi-agent trajectory planning with NUV priors**— 2024 · 6+ citations

**ReactiveMP.jl: A Julia package for reactive variational Bayesian inference**— 2022 · 6+ citations

**Message passing-based inference in the Gamma mixture model**— 2021 · 6+ citations

**Expected free energy-based planning as variational inference**— 2025 · 4+ citations

**Gaussian Variational Inference with Non-Gaussian Factors for State Estimation: A UWB Localization Case Study**  
— 2026 · 1+ citations

**ExponentialFamilyManifolds.jl: Representing exponential families as Riemannian manifolds**— 2025 · 1+ citations

**GraphPPL.jl: A Probabilistic Programming Language for Graphical Models**— 2024 · 1+ citations

**Riemannian black box variational inference**— 2024 · 1+ citations

**Message passing-based inference in switching autoregressive models**— 2022 · 1+ citations

**Composing Non-Conjugate Factor Graphs with Closed-Form Variational Inference**— 2026 · 0+ citations

## PRESENTATIONS & TALKS

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**PyData Eindhoven @ BrightCape**— PyData Eindhoven @ BrightCape · [YouTube](#)

**PyData 2025 Opening**— PyData Eindhoven 2025 · [YouTube](#)

**What's Wrong with Active Inference and How Lazy Dynamics Is Set to Solve It**— ActInf ModelStream 017.1 · [YouTube](#)

**Learning Bayesian Statistics Podcast - Guest Appearance**— Learning Bayesian Statistics Podcast · [YouTube](#)

**RxInfer.jl updates and development**— 4th Applied Active Inference Symposium · [YouTube](#)

**RxInfer.jl: A Package for Real-Time Bayesian Inference**— JuliaCon 2023 · [YouTube](#)

**Enacting Ecosystems of Shared Intelligence**— 3rd Applied Active Inference Symposium · [YouTube](#)

**Building Smarter AI: Active Inference & Nested Models**— Active Inference Conference · [YouTube](#)

**GraphPPL.jl: A Package for Specification of Probabilistic Models**— JuliaCon 2022 · [YouTube](#)

**Fast Bayesian Inference with RxInfer.jl**— Julia User Group Munich · [YouTube](#)

**Implementing Active Inference by Message Passing in a Factor Graph**— ActInf ModelStream #004.1 · [YouTube](#)

**ReactiveMP.jl: Reactive Message Passing-based Bayesian Inference**— JuliaCon 2021 · [YouTube](#)

**Rocket.jl: A Julia package for reactive programming**— JuliaCon 2020 · [YouTube](#)

## HOBBIES & INTERESTS

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### Skydiving

There's something magical about stepping out of a perfectly good airplane at 13,000 feet.

### Drumming

When Mother Nature grounds my skydiving adventures, I channel that energy into drumming.

### Snowboarding/Skiing

My love affair with mountain sports began at 14 in Russia, carving my first turns on a snowboard.

### Wakeboarding

When the mountains are green and the lakes are calling, I trade my skis for a wakeboard.

### Ship Modelling

When the world shut down during COVID, I discovered the meditative art of ship modeling.

### Video Editing

Behind every great adventure is a story waiting to be told.