

Education

- 10/2025–04/2026** **BMS Phase II Student** (Graduate school of the three Berlin Universities.)
- 04/2021 – 03/2023** **Mathematics Master's** (Technical University Berlin. Final grade: 1.1. Focus on further Functional Analysis topics as well as Topology, Differential Geometry, Complex Analysis and Statistics. Master's thesis: Wasserstein gradient flows - with an eye towards positive matrix-valued measures. Supervised by Prof. Gabriele Steidl and Dr. Robert Beinert.)
- 10/2017 – 03/2021** **Mathematics Bachelor's** (Technical University Berlin. Final grade: 2.0. Focus on Functional Analysis and Differential Equations with a minor in Machine Learning. Bachelor's thesis: Atomic Norm Minimisation for Superresolution. Supervised by Prof. Gabriele Steidl and Dr. Robert Beinert.)

Positions

- 11/2025** **One week research visit (Joaquín Míguez at the University Carlos III Madrid)** (Generative modelling with Bernstein approximations of f -divergences.)
- 08/2024 – 09/2024** **Research visit (Wuchen Li at the University of South Carolina)** (Accelerated Stein metric gradient flows with general bilinear kernels on Gaussian families.)

In the Applied Mathematics group within the Institute of Mathematics at Technical University Berlin.

- 01/2024 – 04/2026** **PhD candidate** (With teaching responsibilities.)
- 04/2023 – 12/2023** **PhD candidate** (Funded by a stipend and by the German Federal Ministry of Education and Research under the project "VI-Screen".)
- 06/2021 – 03/2023** **Student research assistant** (Research on Wasserstein gradient flows, writing a script for the lecture "Approximation theory", rewriting the script for the lecture "Convex Analysis" in the setting of infinite-dimensional spaces, and proofreading manuscripts.)

At the Department of Mathematics, Technical University Berlin.

- 10/2019 – 03/2021** **Tutor** (Giving tutorials and correcting homework for the lectures "Functional Analysis I", "Differential Equations I" and "Linear Algebra for Engineers".)

Publications

- 10/2025** **J. Bresch, V. Stein: Interpolating between Optimal Transport and KL regularized Optimal Transport using Rényi Divergences** (Accepted in Results in Mathematics.)
- 07/2025** **R. Duong, V. Stein, R. Beinert, J. Hertrich, G. Steidl: Wasserstein Gradient Flows of MMD Functionals with Distance Kernel and Cauchy Problems on Quantile Functions** (Accepted in ESAIM: Control, Optimisation and Calculus of Variations.)
- 06/2025** **V. Stein, W. Li: Accelerated Stein Variational Gradient Flow** (Accepted for publication in the Springer LNCS proceedings of GSI'25: Geometric Science of Information in Information Geometry.)
- 06/2025** **R. Duong, N. Rux, V. Stein, G. Steidl: Wasserstein Gradient Flows of MMD Functionals with Distance Kernels under Sobolev Regularization** (Philosophical Transactions of the Royal Society A, vol. 383, issue 0243 "Partial differential equations in data science".)

04/2025	V. Stein, S. Neumayer, N. Rux, G. Steidl: Wasserstein Gradient Flows for Moreau Envelopes of f-Divergences in Reproducing Kernel Hilbert Spaces (Accepted for publication in Analysis and Applications.)
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Preprints

09/2025	Towards understanding Accelerated Stein Variational Gradient Flow - Analysis of Generalized Bilinear Kernels for Gaussian target distributions (With Wuchen Li, University of South Carolina.)
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Talks

03/2026	tbd (MFO Workshop 2613 - Flows on Measure Spaces and Applications in Machine Learning.)
11/2025	Accelerated Stein Variational Gradient Flow (At the colloquium of the Signal Processing Department of University Carlos III Madrid.)
10/2025	Accelerated Stein Variational Gradient Flow (GSI'25: Geometric Structures of Statistical & Quantum Physics, Information Geometry, and Machine Learning (Saint-Malo, France), fully funded by the DAAD.)
09/2025	Wasserstein Gradient Flows for Moreau Envelopes of f-Divergences in Reproducing Kernel Hilbert Spaces (MML'25: Conference on Mathematics of Machine Learning 2025 in Hamburg, Germany.)
04/2025	Accelerated Stein Variational Gradient Flow (Stan Osher's UCLA level set seminar)
09/2024	Interpolating between Optimal Transport and KL regularized Optimal Transport using Rényi Divergences. (University of South Carolina Mathematics Graduate Colloquium)
08/2024	Wasserstein Gradient Flows of MMD Functionals with Distance Kernel and Cauchy Problems on Quantile Functions. (Joint Applied and Computational Mathematics (Changhui Tan & Siming He) and RTG data science seminar (Wuchen Li), University of South Carolina.)
08/2024	Wasserstein Gradient Flows for Moreau Envelopes of f-Divergences in Reproducing Kernel Hilbert Spaces (Stan Osher's UCLA level set seminar)

Poster Presentations at Conferences

08/2025	Mathematical and Scientific Machine Learning in Naples, Italy. (Accelerated Stein Variational Gradient Flow)
10/2024	SIGMA (Signal - Image - Geometry - Modelling - Approximation) Workshop at the CIRM in France. (Wasserstein Gradient Flows for Moreau Envelopes of f -Divergences in Reproducing Kernel Hilbert Spaces)
06/2024	LOL: Learning and Optimization in Luminy at the CIRM, France. (Wasserstein Gradient Flows for Moreau Envelopes of f -Divergences in Reproducing Kernel Hilbert Spaces)
03/2024	Workshop on Optimal transport from theory to applications - Interfacing dynamical systems, optimization and machine learning in Berlin, Germany. (Wasserstein Gradient Flows for Moreau Envelopes of f -Divergences in Reproducing Kernel Hilbert Spaces)

Teaching

Winter 2025/26	Harmonic Analysis (Lecture assistant. Elective BMS advanced module in the Mathematics program.)
Winter 2025/26	Numerical Mathematics I (Tutor. Third-semester compulsory module (in German) in the Mathematics Bachelor's program.)
Summer 2025	Mathematical Physics II - Statistical Mechanics (Lecture assistant. Advanced BMS module for Master's students in the Mathematics program.)
Summer 2025	Probability Theory I (Tutor. Compulsory fourth-semester undergraduate course in the Mathematics program.)
Winter 2024/25	Analysis II for Mathematicians (Tutor. Compulsory module in the Mathematics program, covering multidimensional differentiation.)
Winter 2024/25	Harmonic Analysis (Lecture assistant)
Summer 2024	Convex Analysis (Lecture assistant. Elective advanced module.)
01/2024 - 02/2024	Numerical Mathematics I (Lecture assistant)

Supervised Thesis

03/2025	Roxane Leitheiser, Technical University Berlin (Wasserstein Gradient Flows of the MMD with Riesz Kernels on the Real Line. Bachelor's thesis. First supervisor: Gabriele Steidl.)
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Journal and Conference Refereeing

I have reviewed for the Journal of Optimization Theory and Applications (JOTA), Transactions on Machine Learning Research (TMLR) as well as for the Bayesian Decision-making and Uncertainty Workshop at NeurIPS 2024.

Awards

At the 17th annual Dies Mathematicus (TU Berlin, 2022), I received the prize for the Best Bachelor's Thesis Talk.

IT Skills

I have strong knowledge of Python (including PyTorch) and experience using HPC clusters. Furthermore, I am comfortable with MATLAB and well versed in \LaTeX .

Volunteer Work

In the school year 2022/23 I have been tutoring around fourteen seventh-graders in weekly sessions discussing mathematical puzzles and questions from the German Mathematical Olympiad. I have also served as corrector at the team competition at the Tag der Mathematik 2022 (Mathematics Day) organized by the three Berlin universities, where sixty-nine teams of high schoolers participated.

Language Skills

German: native. English: fluent (spoken and written). French: beginner.

References

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