


# Curriculum Vitæ

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## Work experience

- 04/2024 – 12/2024   **Postdoctoral Researcher**, *Technische Universität Berlin*, Machine Learning Group.  
Intersection between Langevin Dynamics and Normalizing Flows
- 12/2019 – 04/2024   **PhD Student & Teaching Assistant**, *Technische Universität Berlin*, Machine Learning Group.  
Research Focus: Probabilistic Machine Learning in High Energy Physics  
Thesis: Path gradients for Normalizing Flows  
Grade: Summa cum laude  
Courses Taught: Introductory and Advanced Machine Learning  
Supervisor: Prof. Klaus-Robert Müller
- 03/2022 – 04/2022   **Research Internship**, *Cyprus Institute*, Computation-based Science and Technology Research Center.  
Research project:  $SU(N)$ -equivariant continuous normalizing flows for lattice gauge theory.
- 05/2019 – 05/2020   **Guest Researcher**, *Hasso Plattner Institute*, Digital Health & Machine Learning.  
Research topic: Sparse Gaussian Processes for Genome-Wide Association Studies.
- 05/2019 – 11/2019   **PhD Scholarship**, *Technische Universität Berlin*, Machine Learning Group.  
Application of Sparse Gaussian Processes in Statistical Genetics. Familiarization with Bayesian Deep Learning.
- 05/2017 – 12/2018   **Student Assistant**, *Technische Universität Berlin*, Robotics and Biology Laboratory.  
Investigated algorithmic priors for facilitating reinforcement learning, machine learning for teleoperating a robotic hand.
- 11/2016 – 02/2017   **Student Assistant**, *Forschungszentrum Informatik*, Außenstelle Berlin.  
Text mining, data analysis and work on blockchain-based smart contracts.

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## Education

- 10/2016 – 01/2019   **M.Sc. Computer Science**, *Technische Universität Berlin*, GPA 3.8/4.0.  
Specialization: Cognitive Systems  
Thesis: Sparse Gaussian Processes for classification with correlated noise
- 09/2015 – 07/2016   **M.Sc. Computer Science**, *Universitat Politècnica de València*, GPA 3.5/4.0.  
Stay abroad with ERASMUS+. Focus on Artificial Intelligence and Pattern Recognition.
- 10/2012 – 08/2015   **B.Sc. Informatik**, *RWTH Aachen University*, Aachen, GPA 3.0/4.0.  
Minor: Mechanical Engineering  
Thesis: Developing embedded systems for detecting faults in ECLA therapy

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## Main programming skills

Python, Pytorch, Git, Latex, Vim, SLURM

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## Languages

German	Mother tongue
English	Proficient (C1)
Spanish	Proficient (C1)

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## Publications

- **Vaitl, Lorenz**, K. A. Nicoli, S. Nakajima, and P. Kessel. Path-Gradient Estimators for Continuous Normalizing Flows. In *ICML 2022*, 2022. **Oral presentation**, [proceedings.mlr.press/v162/vaitl22a.html](https://proceedings.mlr.press/v162/vaitl22a.html)
- **Vaitl, Lorenz**, K. A. Nicoli, S. Nakajima, and P. Kessel. Gradients should stay on Path: Better Estimators of the Reverse- and Forward KL divergence for Normalizing Flows. *Machine Learning: Science and Technology*, 2022. [doi.org/10.1088/2632-2153/ac9455](https://doi.org/10.1088/2632-2153/ac9455)
- **Bacchio, Simone**, P. Kessel, S. Schaefer, and **Vaitl, Lorenz**. Learning Trivializing Gradient Flows for Lattice Gauge Theories. *Physical Review D*, 107(5), 2023. [doi.org/10.1103/PhysRevD.107.L051504](https://doi.org/10.1103/PhysRevD.107.L051504)
- **Vaitl, Lorenz**, L. Winkler, L. Richter, and P. Kessel. Fast and Unified Path Gradient estimators for Normalizing Flows. 2024. ICLR 2024, [openreview.net/forum?id=zlkXLb3wpF](https://openreview.net/forum?id=zlkXLb3wpF)