PASCAL VAN DER VAART

Leiden, Netherlands

TU Delft

sept 2021 - present (expected graduation: sept 2025)

PhD Candidate researching epistemic uncertainty in machine learning, supervised by Matthijs Spaan and Neil Yorke-Smith. Currently working on Bayesian methods for deep learning. *Coursework*: Stochastic Gradient Techniques in Optimization and Learning

Leiden University

sept 2019 - nov 2021

sept 2016 - aug 2019

MSc. Applied Mathematics (cum laude) GPA: 8.6/10 *Coursework:* asymptotic statistics, machine learning theory, measure theoretic probability, applied deep learning, reinforcement learning, numerical linear algebra, continuous optimization

Leiden University

BSc. Mathematics (cum laude) GPA: 8.2/10 **BSc.** Physics (cum laude) GPA: 8.3/10 *Coursework:* mathematical statistics, numerical mathematics, measure theory, random walks

EXPERIENCE

Analyst, Northpool, Leiden

dec 2020 - may 2021 Developed optimization methods to price gas storage in Europe, and forecasted European day ahead auction prices in a predict-then-optimize paradigm.

july 2020 - dec 2020 Internship, Northpool, Leiden Developed statistical and deep learning models in Python at an energy trading company to gain insight into drivers of the energy markets.

Teaching assistant, Leiden University sept 2018- june 2020 Guided students in exercise classes and graded homework assignments for several courses including programming methods (Python), statistics, multivariate analysis, and statistical modelling.

PROJECTS

MSc Thesis: Tensor Decompositions for multi-agent Reinforcement learning jan 2021 - nov 2021 A MSc graduation project about tensor approximation methods with applications to reinforcement learning, leading to a position paper at the Qantum Tensor Networks in Machine Learning workshop at Neurips 2021. Supervised by Anuj Mahajan (University of Oxford) and Johannes Schmidt-Hieber (Leiden University)

Statistical Methods for Quantum State Estimation, Leiden University jan 2019 - aug 2019 A mathematics and physics bachelor research project, designing and implementing statistical methods involving maximum likelihood estimation and Bayesian mean estimation via Monte Carlo methods in Python for a problem in physics.

SKILLS

Programming Languages/Frameworks

proficient: Python, ML frameworks: JAX, also familiar with TensorFlow and Torch familiar: R, Javascript, C++

Languages

English (C2 Proficiency), Dutch (native)

PUBLICATIONS

- Pascal R. Van der Vaart, Matthijs T.J. Spaan, and Neil Yorke-Smith. Epistemic bellman operators. In Proceedings of the Thirty-Ninth AAAI Conference on Artificial Intelligence, AAAI'25. AAAI Press, 2025. To appear.
- [2] Pascal Van der Vaart, Neil Yorke-Smith, and Matthijs Spaan. Bayesian ensembles for exploration in deep reinforcement learning. In *Proceedings of the 2024 International Conference on Autonomous Agents and MultiAgent Systems*, AAMAS '24, Richland, SC, 2024. International Foundation for Autonomous Agents and Multiagent Systems.
- [3] Pascal Van Der Vaart, Anuj Mahajan, and Shimon Whiteson. Model based multi-agent reinforcement learning with tensor decompositions. 2nd Workshop on Quantum Tensor Networks in Machine Learning (NeurIPS 2021), 2021.