HIDDE FOKKEMA

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EXPERIENCE

AI Research Engineer

Plumerai *2026/05-Present*

- Plumerai develops hyper efficient TinyAI for on the edge.

Machine Learning Scientist

Booking.com *2025/07-2025/09*

- Visiting Researcher, researching the impact of using various bandit optimisation algorithms for e-commerce applications.

Junior Quantitative Consultant

Amsterdam Data Collective *2018/03-2021/06*

- Developed and deployed a full-stack NLP web application, using Django, Plotly, PyTorch, and Docker for HelloFresh to analyse consumer reviews and optimise the consumer feedback process. Set up CI/CD pipelines to accelarate client feedback.
- Built a tool that automatically scrapes, analyses, filters and recommends biomedical articles based, streamlining the process of finding new leads at NLC, a health-tech incubator.
- Designed and implemented a dashboard to visualise flight occupation and pricing data for Accelya, leading to insights into the profitability of several flight routes.
- Developed key components of an Expected Credit Loss model for the consumer loan portfolio at Aegon Bank as part of the IFRS 9 report to the European Central Bank.

Teaching Assistant

University of Amsterdam *2018/05-2024/08*

As a student and during the PhD, assisted as a TA in several Bachelor and national Master courses for the mathematics programme:

- **Bachelor:** Was responsible for organizing exercise class, grading exams and developing solution sheets for the courses: *stochastics 2: statistics, Bayesian statistics* and *Introduction to numerical mathematics*.
- **Master:** Provided lecture style solution classes and graded exams for master courses *machine learning theory (M1)* and *stochastic intergration (M2)*.

International Volunteer

European Youth Parliament *2014/09-2019/03*

- (2017-2019), Treasurer of EYP NL. Oversaw yearly budgets of €200.000.
- (2016-2017), Head-organiser of the 17th National Selection Conference of EYP NL in Maastricht. Fundraised €15.000 and oversaw the coordination of a volunteer team of over 50 people responsible for 150 participants.

EDUCATION

PhD in Mathematical Machine Learning

University of Amsterdam *2021/09 - 2025/11*

Thesis title: *Mathematical Foundations of Explainable AI and Advances in Bandit Optimisation*.

Supervised by: dr. Tim van Erven.
Defended on: 2026/01/27

Conducted research and developed theory for a wide range of topics in machine learning and deep learning, covering attribution methods, counterfactual explanations, concept-based models and bandit convex optimisation

- Proposed and proved several impossibility results for attribution and counterfactual methods.
- Introduced new statistical estimators for concept-based models, equipped with finite sample guarantees which enable theb incorporation of techniques from causal representation learning.
- Advanced the best known efficient algorithm for convex bandit optimisation in the stochastic and adversarial case.

Published in NeurIPS, JMLR, COLT and AISTATS.

Reviewed for AISTATS, COLT, ICLR, TMLR, UAI and Journal of Approximate Reasoning.

MSc. in Mathematics

University of Amsterdam *2019/09 - 2021/08*

Stochastics track, GPA: 8.9 (*Cum Laude*).
Thesis title: *Stability and Computation of Martingale Optimal Transport*.

Supervision: prof. dr. Peter Spreij, dr. Sonja Cox.

- Courses in machine learning theory, stochastic processes, stochastic integration, topological data analysis, numerical methods for linear algebra and PDEs and differential geometry.

BSc. in Mathematics
BSc. in Physics and Astronomy

University of Amsterdam *2015/09 - 2019/08*

Focused on courses in probability, numerical methods, quantum mechanics and electro dynamics. GPA: 8.1.
Thesis title: *Learning and Thermodynamics*.

Supervision: dr. Bas Kleijn, dr. Greg Stephens

- Extra minor Artificial Intelligence (36 EC) with courses in machine learning, reinforcement learning, NLP and fuzzy logic.

SKILLS

Languages	Dutch (Native), English (Fluent), German (Intermediate), French (Basic)
Program Languages	Python (2017-present), Javascript/Typescript (2020-present) HTML (2020-present), Rust (2022-present), C++ (2025-present)
ML/DL frameworks	Scikit-Learn (2018-present), PyTorch (2020-present), JAX (2022-present)
Tools	Git (2018 - present), Docker (2020 - present), SLURM (2022 - present), CI/CD (Github actions and Gitlab CI/CD) (2020 - present)
Databases	SQL (2018-2021), MySQL (2018-2021), DuckDB (2024-present), Django (2018-2021)
Academic	Writing, Research, Teaching and Presenting complex subjects for both a scientific and broader audience
Collaborating	Experience with working across different departments, with client and non-technical teams.

PUBLICATIONS

Published

- H. Fokkema, T. van Erven, S. Magliacane, Sample-efficient Learning of Concepts with Theoretical Guarantees: from Data to Concepts without Interventions, *Conference on Neural Information Processing Systems*, 2025
- G. König, H. Fokkema, T. Freiesleben, C. Mendler-Dünner, U. von Luxburg, Performative Validity of Recourse Explanations, *Conference on Neural Information Processing Systems*, 2025
- H. Fokkema, D. van der Hoeven, T. Lattimore, J. Mayo, Online Newton Method for Bandit Convex Optimisation, *Conference on Learning Theory*, PMLR, vol. 196, 2024.
- H. Fokkema, D. Garreau, T. van Erven, The Risks of Recourse in Binary Classification, *International Conference on AI & Statistics*, PMLR, vol. 238, pp. 550–558, 2024.
- H. Fokkema, R. de Heide, T. van Erven, Attribution-based Explanations that Provide Recourse Cannot be Robust, *Journal of Machine Learning Research*, vol. 24, no. 360, pp. 1-37, 2023.

SELECTED TALKS

- Explainable Learning & Reasoning Workshop at Cardiff University, Performativity and Risks of Algorithmic Recourse, June 2025;
- Tübingen AI Center Talks, Using Causal Representation Learning for to formalize concept extraction from learned representations, November 2024;
- International Conference on Machine Learning, Attribution-based Explanations that Provide Recourse Cannot be Robust, poster, July 2024;
- Conference on Learning Theory, Online Newton Method for Bandit Convex Optimisation, June 2024
- International Theory of Interpretable AI Seminar, Attribution-based Explanations that Provide Recourse Cannot be Robust, May 2024;
- Ministry of Justice and Security, Some Theoretical Limitations of Explainability Methods, March 2024
- Saarland University Workshop on Interpretability and Recourse, The Risks of Recourse in Binary Classification, October 2023;
- Amsterdam Business School, The Risks of Recourse in Binary Classification, September 2023;
- Xomnia Data Seminar, Some Theoretical Limitations of Explainability Methods, September 2023;
- 1st Nice workshop on Interpretability, Attribution-based Explanations that Provide Recourse Cannot be Robust, November 2022;
- 1st Workshop Mathematics & Artificial Intelligence, Attribution-based Explanations that Provide Recourse Cannot be Robust, poster presentation, June 2022;

HOBBIES AND INTERESTS

- Running
- Reading
- Field Hockey
- Mountain Sports and Hiking
- Electronic Music Production
- (Modular) Synthesis