HIDDE FOKKEMA

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EDUCATION

PhD in Mathematical Machine Learning *2021/09 -*
University of Amsterdam, Project title: *Formalising Explainable AI*.
Supervised by: dr. Tim van Erven. Expected completion date: 2025/08/31

Conducted and published research in developing theory for the field of interpretable machine learning. Additionally, worked on classical topics such as bandit theory and online learning.

MSc. in Mathematics *2019/09 - 2021/08*
University of Amsterdam, Stochastics track, GPA: 8.9 (*Cum Laude*).
Thesis title: *Stability and Computation of Martingale Optimal Transport*.
Supervision: prof. dr. Peter Spreij, dr. Sonja Cox.

Took courses in stochastic processes, stochastic integration, machine learning theory, topological data analysis, numerical methods and differential geometry.

Double BSc. in Mathematics and Physics *2015/09 - 2019/08*
University of Amsterdam, GPA: 8.1.
Minor (36 EC): Artificial Intelligence
Thesis title: *Learning and Thermodynamics*.
Supervision: dr. Bas Kleijn, dr. Greg Stephens

EXPERIENCE

Junior Quantitative Consultant 2018/03-2021/06
Amsterdam Data Collective *Amsterdam, NL*

- 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.
- Designed and implemented a dashboard to visualise flight data for Accelya, leading to insights into the profitability of several flight routes.
- Streamlined the process of finding new leads at NLC, a health-tech incubator, by developing a tool to scrape, analyse and recommend biomedical articles.
- Built a full-stack web application, using Django, Plotly and PyTorch, for HelloFresh that leverages NLP techniques to analyse consumer reviews and optimise the consumer feedback process. Additionally set up CI/CD pipelines to quickly incorporate any client feedback.

Teaching Assistant 2018/05-2024/08
University of Amsterdam *Amsterdam, NL*
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 2014/09-2019/03

European Youth Parliament (EYP)

The European youth Parliament is an international network active in over 40 countries in Europe. Its goal is to provide young people an interactive educational platform. The events that are organised offer participants the opportunity to express their opinions and ideas about a wide range of topics.

- (2017-2019), Treasurer of EYP NL. I oversaw the financial well-being of EYP NL, with 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.

PUBLICATIONS

Published

- 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.
- 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, D. van der Hoeven, T. Lattimore, J. Mayo, Online Newton Method for Bandit Convex Optimisation, *Conference on Learning Theory*, PMLR, vol. 196, 2024.

Preprints

- H.Fokkema, T. van Erven, S. Magliacane, Sample-efficient Learning of Concepts with Theoretical Guarantees: from Data to Concepts without Interventions, ArXiv

SELECTED TALKS

- 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;

SKILLS

Languages	Dutch (native), English (fluent), German (basic), French (basic)
Program Languages	Python, LaTeX, Mathematica, Javascript/Typescript, Matlab, R, HTML, Rust
ML frameworks	Scikit-Learn, PyTorch, JAX
Tools	Vim, Git, Docker
Databases	SQL, MySQL, DuckDB, Django