PATRICK ALTMEYER

Researching Trustworthy Artificial Intelligence (AI) for Finance and Economics

I am an economist by background with an interest in cross-disciplinary research on the intersection of Trustworthy AI and Financial Economics. For my PhD in Trustworthy AI, I currently focus on Counterfactual Explanations and Probabilisitic Machine Learning under supervision of Cynthia Liem at Delft University of Technology.

EDUCATION

2025 | 2021
PhD in Computer Science
Delft University of Technology — Delft, Netherlands

Thesis topic: Counterfactual Reasoning and Probabilistic Methods for Trustworthy AI with Applications in Finance

2021
Master in Data Science
Barcelona School of Economics — Barcelona, Spain

Thesis: Deep Vector Autoregression for Macroeconomic Data

2018
Master in Economics and Finance
Barcelona School of Economics — Barcelona, Spain

Thesis: Option Pricing in the Heston Stochastic Volatility Model

2017
Master of Arts with Honours in Economics
University of Edinburgh — Edinburgh, United Kingdom

Thesis: Can misguided monetary policy explain the European housing bubble?

PROFESSIONAL EXPERIENCE

2021 | 2018
Economist
Bank of England — London, United Kingdom

- Co-author of two staff working papers.
- Econometric data analysis.
- Co-initiated and led app development.
- Briefing work for policy committees.

2017
Postgraduate Intern
Bank of England — London, United Kingdom

- Econometric analysis of transaction data set in R.
- Internal presentation of project results.

CONTACT INFO

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For more information, please contact me via email.

SKILLS

Experienced in Machine Learning, Finance, Economics and Monetary Policy.

Highly skilled in Julia, R, Python and Quarto.

Research expertise in the field of Explainable Artificial Intelligence.

Last updated on 2024-03-11.

TEACHING EXPERIENCE

2024 | 2023 **Master's Thesis Supervision**
Research co-supervisor of various Master's students — Delft, Netherlands

2023 **Software Project Supervision**
Project supervisor for two groups of students — Delft, Netherlands
- Proposal of two software projects related to Trustworthy AI in Julia.
- Supervision of two groups of five undergraduate students working on the project.

2022 **Bachelor's Thesis Supervision**
Research supervisor for group of students — Delft, Netherlands
- Proposal of final-year research project on Endogenous Dynamics in Algorithmic Recourse.
- Supervision of group of three undergraduate students working on the project.

2021 **Foundations of Data Science Summer School**
Teaching Assistant at Barcelona School of Economics — Barcelona, Spain

2020 | 2019 **Introduction course to R and Git**
Lead Trainer at Analytics Enablement Hub, Bank of England. — London, United Kingdom

2017 | 2016 **Honours Modules in Econometrics**
Teaching assistant at School of Economics, University of Edinburgh — Edinburgh, United Kingdom

SELECTED PUBLICATIONS

2023 **Faithful Model Explanations through Energy-Constrained Conformal Counterfactuals**
The 38th Annual AAAI Conference on Artificial Intelligence (upcoming): [pre-print] — Delft, Netherlands

2023 **Explaining Black-Box Model through Counterfactuals**
The Proceedings of the JuliaCon Conferences: [PDF] — Delft, Netherlands

2023 **Endogenous Macrodynamics in Algorithmic Recourse**
First IEEE Conference on Secure and Trustworthy Machine Learning: [PDF] — Delft, Netherlands
Altmeyer P., Angela G., Buszydlik A., Dobiczek K., van Deursen A., Liem C.C.S.

2023 **Yield Curve Sensitivity to Investor Positioning Around Economic Shocks**
Bank of England Staff Working Paper: [PDF] — London, United Kingdom
Altmeyer P., Boneva L., Kinston R., Saha S., Stoja E.

2021 **Deep Vector Autoregression for Macroeconomic Data**
Masters Thesis (selected for publication): [PDF], [GitHub] — Barcelona, Spain
Agustí M., **Altmeyer P.**, Vidal-Quadras Costa I.

2018 **Option Pricing in the Heston Stochastic Volatility Model: an Empirical Evaluation**
Masters Thesis (selected for publication): [PDF] — Barcelona, Spain
Altmeyer P., Grapendal J., Pravosud M., Quintana G.

SELECTED CONFERENCES, WORKSHOPS AND POSTERS

2024 **Navigating the Interplay of Explainability and Privacy in AI**
Contributed talk at workshop: Faithful Model Explanations through Energy-Constrained Conformal Counterfactuals
Delft, Netherlands

2023 **Workshop at De Nederlandsche Bank**
Invited talk: Faithful Model Explanations-Central Bank Supervision in the Age of AI — Amsterdam, Netherlands

2023 **Datamiddag 2023: van PET tot Haring**
Invited talk: Faithful Model Explanations — The Hague, Netherlands

2023 **JuliaCon 2023**
Main talk: Predictive Uncertainty Quantification in Machine Learning — MIT in Boston, USA

2023 **Delft FinTech Lab Launch**
Invited talk: Echos from the Black Box — Delft, Netherlands

2023 **First IEEE Conference on Secure and Trustworthy Machine Learning**
Oral: Endogenous Macrodynamics in Algorithmic Recourse — Raleigh, North Carolina

2022 **New Methods Seminar at the Bank of England**
Invited talk: Explaining Black-Box Models through Counterfactuals — London, United Kingdom

2022 **ING Data Science Community Conference 2022**
Contributed talk: Explaining Black-Box Models through Counterfactuals — Amsterdam, Netherlands

2022 **JuliaCon 2022**
Presented Julia packages I developed — Virtual

- Explaining Black-Box Models through Counterfactuals (main talk)
- Effortless Bayesian Deep Learning through Laplace Redux (lightening talk)
- Julia and Quarto: A Match Made in Heaven? (experience talk)

2022 **ProbAI 2022 Summer School**
Poster presentation "Explainable AI: Probabilistic Methods for Counterfactual Explanations": [poster]
Helsinki, Finland

2022 **TU Delft EEMCS PhD event**
Poster presentation "Counterfactual Explanations and Algorithmic Recourse": [poster] — Delft, Netherlands

2022 **De Nederlandse Bank Conference "Central Bankers Go Data Driven: Applications of AI and ML for Policy and Prudential Supervision"**
Poster presentation of Altmeyer, Agusti, and Vidal-Quadras Costa (2021). — Amsterdam, Netherlands

2022 **IFC and Bank of Italy workshop on "Data science in central banking"**
Presentation of Altmeyer, Agusti, and Vidal-Quadras Costa (2021): [event link], [YouTube] — Virtual

2021 **NeurIPS 2021 MLECON Workshop**
Poster presentation of Altmeyer, Agusti, and Vidal-Quadras Costa (2021): [event link] — Virtual

2021 **IFABS 2021 Oxford**
Presented our upcoming BoE Staff Working Paper on yield curve pricing [event link] — Virtual

2019 **Money markets and Central Bank Balance Sheets**
Presented research on demand for central bank reserves at ECB: [event link] — Frankfurt, Germany

SELECTED OPEN-SOURCE SOFTWARE

2022-2024 **ConformalPrediction.jl**
Julia package for Conformal Prediction: [docs], [GitHub]

2021-2024 **CounterfactualExplanations.jl**
Julia package for Counterfactual Explanations: [docs], [GitHub]

2021-2024 **LaplaceRedux.jl**
Julia package for effortless Bayesian Deep Learning: [docs], [GitHub]

2021-2022 **deepvars**
R package implementing Deep Vector Autoregression (Altmeyer, Agusti, and Vidal-Quadras Costa 2021): [GitHub]

OUTREACH AND VOLUNTEERING

2022 | 2021 **Personal blog**
Communication AI in an accessible, visual manner: [url]

2020 **Class representative**
Masters in Data Science — Barcelona, Spain

2016 **TEDx talk**
Held a TEDx talk about European Integration: [YouTube] — Edinburgh, United Kingdom

SCHOLARSHIPS AND AWARDS

2023 **Pluto Notebook Competition for JuliaCon2023**
2nd Price Winner — MIT in Boston, USA

2020 **Novartis Datathon**
3rd Price Winner of Datathon — Barcelona, Spain

2020 **Fee Waiver and Funding for Masters**
Full funding for Masters in Data Science through BSE and Bank of England — Barcelona, Spain

2017 **Fee waiver for Masters**
Total tuition fee waiver for Master in Finance through BSE — Barcelona, Spain

2017 **School of Economics Prize**
Edinburgh University School of Economics Joint Prize for the best performance in Economics — Edinburgh, United Kingdom

2015 **School of Economics Prize**
School of Economics Prize for academic excellence in Economics — Edinburgh, United Kingdom