Markus Mueller

interested in generative modeling, probabilistic machine learning, deep learning for structured data

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Language: German (native), English (fluent), Dutch (beginner)

Education

Econometric Institute, Erasmus University Rotterdam
PhD candidate working on generative models for tabular data, 2022 - expected 2026
Supervisors: Dennis Fok and Kathrin Gruber

Business Data Science / Tinbergen Institute
Joint research master programme of the Erasmus University Rotterdam, Vrije Universteit Amsterdam and the University of Amsterdam
MPhil Business Data Science, with distinction, 2022

University of Warwick
MSc Economics, with distinction, 2018

University of Strathclyde
BA (Hons.) Economics, first-class honours (best in cohort), 2017

Research Visits

University of Amsterdam, AMLab
Supervisor: Christian A. Naesseth, since Oct 2025

University of Cambridge, Van der Schaar Lab
Supervisor: Mihaela van der Schaar, Feb - May 2025

Employment

Erasmus University Rotterdam, Business Economics department
Research assistant for Bas Donkers, Sept - Dec 2021

University of Potsdam, Chair of Empirical Economics
Full-time research and teaching assistant for Marco Caliendo, 2019/20

University of Warwick, Department of Economics
Research assistant for Roland Rathelot, 2018

Research

Ongoing

de Vreede, J., Mueller, M., and Gruber, K. (2025) Hierarchical JEPA for basket representations.

Adapting the JEPA framework and introducing a hierarchical model structure to solve product choice problems.

Mueller, M., Kacprzyk, K. and van der Schaar, M. (2025) Prior-informed conditional flow matching.

We investigate the possibility of incorporating a set of functional priors based on Bernstein polynomials into the flow matching framework.

Mueller, M., Gruber, K. and Fok, D. (2025) Cascaded flow matching for tabular data.

Under review. We propose a cascade pipeline that generates high-resolution information in tabular data based on the low-resolution counterpart, including latent variables we derive from numerical features. This greatly improves the realism of the generated data.

Selected Publications

Mueller, M., Gruber, K. and Fok, D. (2025) Continuous Diffusion for Mixed-Type Tabular Data. ICLR.

Develops a diffusion model that integrates continuous and categorical effectively and efficiently. We unify both feature types in continuous space and balance their losses to avoid implicit importance weights that impact sample quality.

Mueller, M., Gruber, K. and Fok, D. (2023) Continuous Diffusion for Mixed-Type Tabular Data. NeurIPS Workshop on Synthetic Data Generation with Generative AI.

Unpublished

Mueller, M. (2022) Leakage in Adversarial Debiasing as a Consequence of a Multi-Directional Bias in Weight Space. *Research Master thesis*, Grade: 9.0/10 (best thesis in cohort), Supervisor: Bas Donkers.

Mueller, M. (2018) Estimating Anticipation and Treatment Effects of Training the Unemployed in France. *Master thesis*, Grade: 82% (one of the top 10 theses in cohort), Supervisor: Roland Rathelot.

Mueller, M. (2017) An Application of Econometric Methods for the Estimation of Causal Effects in Labour Economics. *Bachelor thesis*, Grade: 90% (best thesis in cohort), Supervisor: Eduardo Fé.

Teaching

Erasmus University Rotterdam

Machine Learning (postgraduate; conceptualizing and grading assignment), Machine Learning in Econometrics (postgraduate; conceptualizing and grading assignment), Machine Learning in Finance (postgraduate; conceptualizing and grading assignment), Data Science in Context (postgraduate; creating course material and exam, grading), Machine Learning Seminar (undergraduate; conceptualizing content and supervising student groups, grading presentations), Academic Writing (undergraduate; weekly feedback on exercises and grading, giving tutorials)

Bachelor thesis supervision (topics including: transfomer-based models and deep learning for tabular data, missing value imputation, uncertainty quantification, denoising autoencoders for tabular data, diffusion models for regression)

Master thesis supervision (topics including: post-hoc auditing of synthetic tabular data, VAE for causal inference)

Business Data Science / Tinbergen Institute

Unsupervised Machine Learning (research master; creating and giving coding tutorials in R), Supervised Machine Learning (research master; creating and giving coding tutorials in R), Statistics (research master; giving tutorials for exam preparation)

University of Potsdam

Machine Learning and Economics (postgraduate; course setup and creation of teaching material, leading seminar discussions), Statistics (undergraduate, online; creation of tutorial videos), Advanced Microeconometrics (postgraduate; lecturer), Applied Public Policy Evaluation (postgraduate; lecturer)

Professional Services

Reviewer: AAAI Good-Data Workshop, 2025; ICLR, 2025

Joint Organizer: Lecture Series on Causal Inference and Machine Learning by Guido W. Imbens, University of Potsdam, 2019; 6th PhD Workshop on Empirical Economics, University of Potsdam, 2019; Econometric PhD Internal Conference, Erasmus University Rotterdam, 2025

Talks/Presentations

Invited talk: Cambridge Center for AI in Medicine Seminar, 2024

Erasmus Center for Data Analytic Insights Social AI seminar, 2023

Research Group Seminar (Statistics and Computer Science) at the Econometric Institute of the Erasmus University Rotterdam, 2022, 2023

PhD Lunch Seminar, Erasmus School of Economics, Erasmus University Rotterdam, 2022

Selected Honors

Nominated for the ODISSEI Open Science Award 2025 and the Open Research Award at the University of Rotterdam 2024, 2025

One of the top 5 submissions to the MOSTLY AI prize (challenge of generating the most realistic, yet private, synthetic tabular data) that made it to the final round, 2025

Full Scholarship (merit-based) for MPhil Business Data Science, 2021

Partial Scholarship for MPhil Business Data Science, 2020

Top 10 Dissertation Award, Department of Economics, University of Warwick, 2018

Sir Charles Carter Prize for outstanding performance (highest average grade in cohort), University of Strathclyde, 2017

Department of Economics Prize for the best dissertation in Economics, University of Strathclyde, 2017

Grants

NWO/SURF EINF grant ($\sim$ 1 200 Euros) for computing resources (reference code: EINF-13805)

NWO/SURF EINF grant ($\sim$ 12 000 Euros) for computing resources (reference code: EINF-7437)

ERIM funding of travel costs (1 500 Euros)

ERIM funding of research visit (3 000 Euros)

Summer Schools and Workshops

High-Performance Computing Tutorial by SURF, 2025

Cambridge ELLIS Unit Summer School on Probabilistic Machine Learning, 2023

Workshop on *Bayesian Conjoint Analysis* by Thomas Otter, 2021

Summer school on *Artificial Intelligence without Bias* by the NoBIAS Research Group, 2021

Workshop on *Machine Learning - An Applied Econometric Approach* by Jann Spiess, 2019

Last updated: November, 2025