Yuliya Shapovalova

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Academic Interests

Probabilistic machine learning and Bayesian statistics, time series, machine learning on graphs, Gaussian processes, uncertainty quantification

Academic Positions

2022–present **Assistant Professor**, Institute for Computing and Information Sciences (ICIS), Faculty of Science, Radboud University

2018–2022 **Post Doc**, Institute for Computing and Information Sciences (ICIS), Faculty of Science, Radboud University

Jan 2018 - Sep 2018 **Research Associate**, Division of Informatics, Imaging, and Data Science, The University of Manchester

2014–2018 **Ph.D. researcher**, Econometrics, Maastricht University

Education

2014–2019 **Ph.D.**, Econometrics, Maastricht University

Thesis *Bayesian Inference in Multivariate Nonlinear State-Space Models*

Supervisors Jean-Pierre Urbain, Michael Eichler

2013–2014 **M. Sc.**, Economic and Financial Research, track Econometrics
Maastricht University

Thesis *Graphical Multivariate Stochastic Volatility Models: Estimation and Model Selection*

Supervisor Michael Eichler

2012–2013 **M. Sc.**, Econometrics and Operations Research, track Econometrics
Maastricht University

Thesis *Conditional Independence and Markov Equivalence in (Granger-causal) Graphical Models*

Supervisor Michael Eichler

Publications

2025 Tiggeloven, T., Ferrario, D., Claassen, J., Jäger, W., **Shapovalova, Y.**, Koyama, M., ... Ward, P. J. (2025). A Global Approach for Mapping Multi-Hazard Susceptibility Using Deep Learning: A Case Study in Japan. Artificial Intelligence for the Earth Systems.

2025 Wang, W., **Shapovalova, Y.**, Li, Y., Wu, X. (2025). Divide-and-conquer offline policy evaluation for contextual bandits. Physica A: Statistical Mechanics and its Applications, 130822.

2025 Cambier van Nooten, C., van de Poll, T., Füllhase, S., Heres, J., Heskes, T., **Shapovalova, Y.** (2025). Graph neural networks for assessing the reliability of the medium-voltage grid. Applied Energy, 384, 125401.

2025 Verbeek, J., Heskes, T., **Shapovalova, Y.** Offline Changepoint Detection With Gaussian Processes. In The 41st Conference on Uncertainty in Artificial Intelligence.

2024 Bouman, R., Schmeitz, L., Buise, L., Heres, J., **Shapovalova, Y.**, Heskes, T. (2024). Acquiring better load estimates by combining anomaly and change point detection in power grid time-series measurements. Sustainable Energy, Grids and Networks, 40, 101540.

2024 de Jong, M., Viebahn, J., **Shapovalova, Y.** (2024). Imitation learning for intra-day power grid operation through topology actions. arXiv preprint arXiv:2407.19865.

2024 Claessen, O., **Shapovalova, Y.**, Heskes, T. Uncertainty Quantification for Scientific Machine Learning: A Physics-Constrained Neural Approach. Available at SSRN 5109125.

2023 **Shapovalova, Y.**, Eichler, M. (2023). Measuring and quantifying uncertainty in volatility spillovers: A bayesian approach. Data Science in Science, 2(1), 2176379.

2023 Cambier van Nooten, C., Schreurs, K., Wijnands, J. S., Leijnse, H., Schmeits, M., Whan, K., **Shapovalova, Y.** (2023). Improving precipitation nowcasting for high-intensity events using deep generative models with balanced loss and temperature data: A case study in the netherlands. Artificial Intelligence for the Earth Systems, 2(4), e230017.

2023 Forbes Beadle, L., Love, J. C., **Shapovalova, Y.**, Artemev, A., Rattray, M., Ashe, H. L. (2023). Combined modelling of mRNA decay dynamics and single-molecule imaging in the Drosophila embryo uncovers a role for P-bodies in 5' to 3' degradation. PLoS biology, 21(1), e3001956.

2022 **Shapovalova, Y.**, Heskes, T., Dijkstra, T. (2022). Non-parametric synergy modeling of chemical compounds with Gaussian processes. BMC bioinformatics, 23(1), 14

2022 **Shapovalova, Y.**, Baştürk, N., Eichler, M. (2021). Multivariate count data models for time series forecasting. Entropy, 23(6), 718.

2022 **Shapovalova, Y.** (2021). "Exact" and approximate methods for Bayesian inference: Stochastic volatility case study. Entropy, 23(4), 466.

2022 Almeida, R. J., Adriaans, G., **Shapovalova, Y.** (2020, June). Graphical causal models and imputing missing data: A preliminary study. In International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems (pp. 485-496). Cham: Springer International Publishing.

Under submission

2025 Claessen, O., **Shapovalova, Y.**, Heskes, T. Heteroscedastic uncertainty quantification in Physics-Informed Neural Networks.

2025 Friedrich, M., Moussa, K., **Shapovalova, Y.**, van der Straten, D. (2025). Forecasting Atmospheric Ethane: Application to the Jungfraujoch Measurement Station (No. TI 2025-025/III). Tinbergen Institute Discussion Paper.

Working papers

2025 Cambier van Nooten C., Aronis C., **Shapovalova Y.**, Cavallaro L. (2025). Exploring the impact of adaptive rewiring n Graph Neural Networks.

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2025 de Jong, M., Viebahn, J., **Shapovalova, Y.** (2025). Generalizable graph neural networks for robust power grid topology control. arXiv preprint arXiv:2501.07186.

2025 Bakker R., **Shapovalova Y.**, Dijkstra T. M.H. , Heskes T., van Gestel C. A.M. , Hoedjes K. (2025). A Gaussian process approach facilitates the identification of robust biomarkers for exposure to complex pesticide mixtures.

Supervision of students

Master thesis supervision

2025 Mats Robben "Improving Precipitation Nowcasting with Deep Learning: Integrating Diverse Meteorological Data and Assessing Predictive Value – A Case Study for the Netherlands"

2025 Jeroen van der Poel "Optimizing Data Generation Pipeline for Graph Neural Networks in Energy Grid Classifications"

2025 Maarten Berenschot "Clustering of Partial Discharge Data"

2024 Benedetta Felici "State-space Wishart Processes for Multivariate Count Data Time Series Analysis"

2024 Susanne van de Logt "Delving Deep: Predictive modelling of the soil thermal resistivity for cable temperature modelling"

2023 Tijn Berns "Improving Scenario-Based Assessment Of Automated Vehicles Using Event Data"

2022 Charlotte Cambier van Nooten "Precipitation nowcasting for high-intensity events using deep generative models"

2022 Jaap Dijkstra "Graph Neural Networks for Grid Expansion"

2021 Luke Reijnen "Scaling Graph Convolutional Neural Networks"

2021 Koert Schreurs "Precipitation Forecasting from Radar Images with Generative Adversarial Networks"

2020 Bob de Ruiter "Multi-model Ensemble for Medium-Term Precipitation Using Convolutional Neural Networks"

2020 Sonja Fúllhase "Testing the $n-1$ principle with Graph Neural Networks"

2019 Sander ter Stege "Optimal Demand Forecasting in-practice"

Bachelor thesis supervision

2025 Ioan-Radu Bocu "Object detection, classification and depth estimation approach deployed on excavators in simulated environments "

2018 Jaap Dijkstra "Gaussian Processes versus Autoregressive Wild Bootstrap: Climate Application"

Summer schools

2025 Machine learning for time series (course leader), one week summer school, co-organized with Roel Bouman

Industrial courses

2025 (upcoming) Stedin - Uncertainty quantification for machine learning and decision making under uncertainty

2025 (upcoming) CHARGE course (model selection for machine learning and AI)

2024 CHARGE course (machine learning for time series, specializing on energy sector applications)

Teaching

Lecturer

2019 – 2025 Statistical Machine Learning (responsible for practical sessions and some of the lectures)

2022 – 2025 Research seminar data science (coordinator)

Teaching Assistant

2019 – 2022 Machine Learning in Practice (supervision of three teams each year in Kaggle competitions)

2019 – 2022 Research Seminar Data Science (supervision of 2-3 students each year in writing referee reports)

Teaching Assistant/Tutor (Problem-Based Learning)

2016 – 2017 Probability Theory

2014 – 2017 Quantitative Methods

2014 – 2017 Quantitative Business and Statistics

Research Grants and Scholarships

Granted

2024 FlexLab - AI Innovatie Lab energie oplossingen (€338.816 RU)

2023 Interdisciplinary Research Platform Voucher (€50.000). "CellFlucsTEST: Cells Exploit Fluctuations To Enable State Transitions", with Hendrik Marks (RU), Maike Hansen (RU), Gabriel Bucur (RU)

2021 Green Information Technology voucher (€30.000). "STORM: Switch Tagging and Outlier Recognition for power grid Measurements", with Roel Bouman (RU), Tom Heskes (RU), Jacco Heres (Alliander)

2020 Educational Innovation grant at Radboud University (€10.000). "Semi-automated assignment grading and evaluation using Jupyter notebooks", with Chris Kamphuis, Gabriel Bucur, Lisa Tostrams, Tom Claassen, Tom Heskes

Applications (not granted)

2024 Just-Trans: Journey to Just Climate Resilient Transitions in Sub-Saharan Africa

2023 HORIZON-MSCA-2023-DN-01: SleepMemo

2022 MARIE SKŁODOWSKA-CURIE ACTIONS: BIDQUANTHA

Committee member

2025 NWO Vidi

Jury member

2024 Open Technology Programme NWO

Program committee member

2019 - 2025 UAI, NeurIPS, ICML, ICLR

Referee activity

2019 - 2025 IEEE Transactions on Neural Networks and Learning Systems, Transactions on Knowledge and Data Engineering, PLOS ONE, Journal of Graphical and Computational Statistics, Nature Communications

Administrative duties

2023-2025 Theme leader of the topic "AI and data science" in Radboud/Alliander collaboration

2022-2023 Program Committee (Radboud University)

Opposition on PhD defense committee

2025 (upcoming) Maria Cairoli "Chemometrics for sustainable decision-making in environmental and industrial applications"

2024 Sil van de Leemput "Efficient neural network training for 4D-CTA stroke imaging"

2023 Kai Chen "Improving Spectral Mixture Kernels for Better Forecasting with Gaussian Processes"

2021 Simone Lederer "Drug-Drug Interaction Models: From Gene Expression to Phenotype"

Presentations

2025 "Machine learning for energy sector", Women in AI for Energy days

2025 "Machine learning for nowcasting and beyond", Infineon internal presentation

"Machine learning for nowcasting and beyond", Infineon internal presentation

2025 "Overview of Deep Learn workshop

2024 Keynote talk at AI for Nowcasting Symposium, "Precipitation nowcasting of high-intensity events with deep generative models", Deltares, Delft

2024 Keynote talk at Interdisciplinary Research Platform, "Interdisciplinary approach to machine learning", Radboud University

2023 "Enhancing Kinetic Models for Gene Expression Dynamics using Gaussian Processes". Group seminar, Radboud University

2021 "Non-parametric drug synergy modeling with Gaussian processes". Faculty seminar, Maastricht University

2021 "Modelling the mRNA degradation dynamics of Drosophila melanogaster early development", GRIND seminar, Manchester University

2020 "Gaussian processes in computational biology: an introduction". Group seminar, Vrij Universiteit Amsterdam

2017 "Volatility spillovers with multivariate stochastic volatility models". Radboud University, Data science group, Nijmegen

2016 "Volatility spillovers with multivariate stochastic volatility models". Workshop on Advances in Quantitative Economics, Maastricht 19-20th of December

2016 "Advances in Bayesian computations with application to stochastic volatility models", CFE-ERCIM Conference, Seville.

2016 "Volatility spillovers with multivariate stochastic volatility models", 15ème Journée d'Économétrie, EconomiX-CNRS, Université Paris Ouest - Nanterre La Défense

2016 "Bayesian inference in multivariate stochastic volatility models". Faculty seminar, Aix-Marseille University (FRUMAM, School of Mathematics)

2015 "Volatility spillovers with multivariate stochastic volatility models". CFE-ERCIM 2015, London

Poster Presentations

2023 EMCC-VII Econometric Models of Climate Change 2023, Amsterdam, The Netherlands

2018 Advances in Data Science 2018, Manchester, United Kingdom

2017 ESOBE 2017, Maastricht, the Netherlands

2017 Sequential Monte Carlo Workshop 2017, Uppsala, Sweden, 29.08-1.09

Workshops and Tutorials Attended

2018 Gaussian Processes Summer School, Sheffield, The UK

2017 Sequential Monte Carlo Workshop, Uppsala, Sweden

2017 Validating and Expanding Approximate Bayesian Computation Methods, Banff, Canada

2016 Bayesian Statistics and Algorithms, CIRM, Marseille, France

2014 Multivariate Time Series: Bayesian Dynamic Modelling and Forecasting, Pisa, Italy

Computer Skills

Everyday Python, R, Fortran, LaTeX

Experienced Matlab

Basic C, SQL

Languages

Russian Mother tongue

English Fluent

Dutch C1