Agnieszka Borowska

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CONTACT INFORMATION

Assistant Professor
VU Amsterdam
Econometrics and Data Science Department

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RESEARCH INTERESTS

Bayesian statistics and econometrics, computational statistics, approximate Bayesian computations, time series, state space models, rare events

EMPLOYMENT

VU Amsterdam, The Netherlands
Assistant Professor, Econometrics and Data Science — from Aug. 2025

Adjunct Lecturer, Econometrics and Data Science — Mar. 2023 – Jul. 2025
(on maternity leave May – Aug. 2023)

Monash University, Australia — planned from December 2022*
Research Fellow, Department of Econometrics and Business Statistics,
Position within ARC Discovery Grant "Loss-Based Bayesian Prediction"
(* accepted then withdrawn due to health/family reasons)

University of Glasgow, UK
Honorary Research Associate — from Mar. 2023

Research Associate in Statistics — Jun. 2020 – Feb. 2023
Position within the Closed-Loop Data Science project
(an EPSRC funded project for Complex, Computationally- and Data-Intensive Analytic)
(on maternity leave Apr. – Nov. 2021)

Research Assistant in Statistics — May 2018 – May 2020
Position within the SofTMech Centre
(an EPSRC centre for Multiscale Soft Tissue Mechanics)

VU Amsterdam, The Netherlands — Sep. 2015 – Jul. 2019
Ph.D. candidate in Econometrics

Erasmus University Rotterdam, The Netherlands — Sep. 2014 – Dec. 2014
Teaching Assistant for graduate level courses

EDUCATION

VU Amsterdam and **Tinbergen Institute**, The Netherlands — Jul. 2019
Ph.D. in Econometrics
Thesis: *Methods for Accurate and Efficient Bayesian Analysis of Time Series*
Supervisors: Siem Jan Koopman and Lennart Hoogerheide

Tinbergen Institute and **VU Amsterdam**, The Netherlands — Aug. 2015
M.Phil. in Econometrics

University of Warsaw, Poland — Sep. 2013
Faculty of Mathematics, Informatics and Mechanics
B.Sc. in Mathematics *minor:* Probability Theory

Warsaw School of Economics, Poland — Jan. 2012
M.Sc. in Economics

VISITS AND EXCHANGES

University of Edinburgh, UK — Apr. 2017 – Jun. 2017
Postgraduate Research Visit at the School of Mathematics
Host: Ruth King

University of Göttingen, Germany — Sep. 2010 – Feb. 2011
Faculty of Economics and Business Administration
M.Sc. programme, exchange within the Erasmus Programme

Publications

Journals

Approximate Bayesian inference in a model for self-generated gradient collective cell movement
with Jon Devlin, Dirk Husmeier and John Mackenzie
Computational Statistics, 2025

Semi-Complete Data Augmentation for Efficient State Space Model Fitting
with Ruth King
Journal of Computational and Graphical Statistics, 2022

Bayesian optimisation for efficient parameter inference in a cardiac mechanics model of the left ventricle,
with Hao Gao, Alan Lazarus and Dirk Husmeier
International Journal for Numerical Methods in Biomedical Engineering, 2022

Neural network-based left ventricle geometry prediction from CMR images with application in biomechanics,
with Lukasz Romaszko, Alan Lazarus, David Dalton, Collin Berry, Xiaoyu Luo, Dirk Husmeier and Hao Gao
Artificial Intelligence In Medicine, 2021

Gaussian Process Enhanced Semi-Automatic ABC: Parameter Inference in a Stochastic Differential Equation System for Chemotaxis,
with Diana Giurghita and Dirk Husmeier
Journal of Computational Physics, 2021

Partially Censored Posterior for Robust and Efficient Risk Evaluation
with Lennart Hoogerheide, Siem Jan Koopman and Herman K. van Dijk
Journal of Econometrics, 2020

Time-varying Combinations of Bayesian Dynamic Models and Equity Momentum Strategies
with Nalan Baştürk, Stefano Grassi, Lennart Hoogerheide and Herman K. van Dijk
Journal of Econometrics, 2018

Bayesian Dynamic Modeling of High-Frequency Integer Price Changes
with István Barra and Siem Jan Koopman
Journal of Financial Econometrics, 2018

Conferences

Evaluating closed-loop effects from vasodilator administration for pulmonary hypertension treatment
with Mitchel J. Colebank, Mette S. Olufsen and Dirk Husmeier
Proceedings of the International Conference on Statistics: Theory and Applications 2023

Inference in Cardiovascular Modelling Subject to Medical Interventions
with Mihaela Paun, Mitchel J. Colebank, Mette S. Olufsen and Dirk Husmeier
Proceedings of the International Conference on Statistics: Theory and Applications 2021

Massive Dimensionality Reduction for the Left Ventricular Mesh
with Lukasz Romaszko, Alan Lazarus, Hao Gao, Xiaoyu Luo and Dirk Husmeier
Proceedings of the International Conference on Statistics: Theory and Applications 2019

Direct Learning Left Ventricular Meshes from CMR Images
with Lukasz Romaszko, Alan Lazarus, Hao Gao, Xiaoyu Luo and Dirk Husmeier
Proceedings of the International Conference on Statistics: Theory and Applications 2019

Working papers

Bayesian risk forecasting for long horizons using importance sampling
with Lennart Hoogerheide and Siem Jan Koopman

Other Research Experience

University of Warsaw, Poland
Researcher Feb. 2012 – Sep. 2014
Pension system reform modelling within the OLG framework under time inconsistency; welfare analysis of various fiscal closures; numerical model solving in Fortran; paper writing and editing.

National Bank of Poland, Warsaw, Poland
Internship in the Economics Institute, Monetary Policy Strategy Bureau Aug. 2009
Comparison and evaluation of the communication tools and institutional solutions implemented in selected central banks.

Project Funding

SofTMech Feasibility Fund (10,000 GBP) Jan. – Mar. 2020
co-investigator and co-supervisor (with Dirk Husmeier, Alan Lazarus and Hao Gao)
A follow-up three-month study on the 2019 project to employ a postdoc to develop a large-scale convolutional neural network for direct learning of 3D geometries from images as well as to perform deep-learning based classification of medical images.

SofTMech Feasibility Fund (10,000 GBP) Jan. – Mar. 2019
co-investigator and co-supervisor (with Dirk Husmeier and Hao Gao)
A three-month project employing a postdoc to investigate the usefulness of deep learning techniques for dimensionality reduction of 3D geometries and for direct learning these geometries from image data.

Teaching Experience

VU Amsterdam, the Netherlands
Lecturer and coordinator of *Fundamental of Time Series Econometrics* Sep.- Dec. 2025
Supervision of Master students in Econometrics and Data Science from Sep. 2023

University of Glasgow, UK
Honours and MSc Projects supervision (Statistics) 2018–2021

VU Amsterdam, the Netherlands
TA for *Econometrics II* (B.Sc. course) Feb. – Mar. 2017
TA for *Business Mathematics* (B.Sc. course, evaluation: 3.8/5) Sep. – Oct. 2016
TA for *Business Statistics* (B.Sc. course, evaluation: 4.1/5) Feb. – Mar. 2016

Tinbergen Institute, Amsterdam, the Netherlands
TA for *Advanced Econometrics II* (M.Phil. course, evaluation: 4.1/5) Jan. – Feb. 2015
TA for *Measure Theory and Stochastic Processes* (M.Phil. course, evaluation: 4.2/5) Sep. – Oct. 2014

Supervised MSc theses

Robin Klaasen, *Multivariate Time Series Analysis – Bayesian Model Averaging versus Optimal Prediction Pools*, Oct. 2025

Thom Brinkhof, *Robust Forecasts of Dutch Bank Deposit Rates: Cointegration-Based ECMs and Bayesian Short-Run Estimation*, Aug. 2025

Tarik Benaich, *Analyzing the effect of different prior model weights in Bayesian Model Averaging*, Jul. 2025

Paulina Siedleczka, *Extending Volatility Estimation Across Trading and Non-Trading Periods: A Finite-Sample and Accessible Approach*, Jul. 2025

Julie van Oldenborgh, *Forecasting Equity Market Volatility for Dutch Pension Funds: A Machine Learning Perspective*, Jul. 2025

Olaf Zegern, *Deep Learning Option Pricing: Benchmarking Transformer architecture against Heston*, Jul. 2025

Auke Evers, *Forecasting Realized Volatility: A Comparative Study of GARCH, Stochastic Volatility, and Machine Learning Models*, Jul. 2025

Tim de Jong, *Enhancing Cryptocurrency Volatility Models with Social Media Sentiment: Benchmarking Against Traditional Indices*, Jul. 2025

Matthijs de Groot, *Applying machine learning techniques, enhancing model interpretability, and addressing class imbalance in probability of default estimation*, Apr. 2025

Julia Lise Droog, *Prioritizing Scouted Youth Players Using Neural Networks and Ordinal Logistic Regression on Text, Static, and Sequential Data*, Jan. 2025

Fabienne van Baren, *Tree-Based Models for Sales Forecasting: A Comparitive Study*, Dec. 2024

Pieter A. Goossens, *Dynamic Forecast Combinations in Unstable Environments: A Locally Stationary Approach*, Aug. 2024

Freek Byrman, *Assessing the Forecasting Performance of Gaussian Process Vector Autoregressive Models in Macroeconomic Forecasting: A Comparative Analysis*, Jul. 2024

Igor Danser, *Analysis of Multi-Dimensional Hybrid Models in Volatility Forecasting*, Jul. 2024

Marjolein Dekker, *Enhancing User Engagement through Content-Based Recommender Systems: A Case Study of A/B Testing on Het Laatste Nieuws and De Stentor*, Jul. 2024

Morris Heijke, *Inflation Forecasting in the Era of Big Data: Machine Learning and Bayesian Econometrics*, Jul. 2024

Dorus van Schaik, *Multivariate Macro-Economic Data: Comparing Forecast Accuracy Between Bayesian And Frequentist Methods*, May 2024

Sanae Azzouzi, *Forecasting Walmart Sales: A Comparative Analysis of Artificial Neural Networks, SARIMAX, and Hybrid Models*, May 2024

Brummer Puttenstein, *Comparing forecast performance multivariate volatility models*, Apr. 2024

Sun Wester, *Forecasting mortality rates in a Bayesian framework using multiple populations*, Apr. 2024

Ara Safaryan, *Customer churn analysis using survival models: comparing semi-parametric, parametric and shrinkage methods*, Mar. 2024

Jelmer de Jong, *Resilience or Luck? An investigation of the predictability of resilience to labour and health shocks*, Mar. 2024

Sam Neefjes, *Do Machine Learning Models Really Outperform Traditional Macroeconometric Models in Inflation Forecasting?*, Mar. 2024

Jasmijn van Wayenburg, *Advancing Customer Segmentation: A multi-method Approach Leveraging Logistic Regression and Clustering Algorithms*, Feb. 2024

Joey Besseling, *A Quantitative Analysis of the Importance of Feature Engineering in the M5-Uncertainty Competition* , Jan. 2024

Laurien van de Coevering, *Hierarchical Bayesian Marketing Mix Modeling: Analyzing Additive versus Multiplicative Approaches to Price Incorporation*, Jan. 2024

Lisanne t'Sas, *The degree, in the short- and long-run, and speed of adjustment of the interest rate pass-through in selected Euro countries*, Jan. 2024

Supervised BSc/Honours theses

Dorian Giulliano Talledo Torres, *Volatility Modeling of Cryptocurrencies*, Sep. 2025

Zoë van Hoof, *Approximate Bayesian forecasting*, Aug. 2025

Martijn Tabor, *Approximating Bayesian Forecasting*, Jul. 2025

Patrick Appeldoorn, *Driving Factors in Equity Mutual Fund Performance Persistence*, Jul. 2025

Xi He, *Modelling and forecasting financial time series of different frequencies*, Apr. 2021

Matthew Baranoff, *Approximate inference in a chaotic growth model*, Apr. 2019

Service

Reviewing for: *Annals of Applied Statistics*, *Journal of the Royal Society Interface*, *Journal of Financial Econometrics*, *Statistical Applications in Genetics and Molecular Biology*, *Computational Economics*, *REVSTAT*, *Journal of Economic Dynamics and Control*

Selected Conference and Seminar Presentations ([P]–poster)

Statistics Seminar Series of the School of Mathematics, Edinburgh, UK (online)	8 Nov. 2021
ML in PL 2021 Conference, Warsaw, Poland (online)	5-7 Nov. 2021
British Applied Mathematics Colloquium (BAMC), Glasgow, UK (online)	6-9 Apr. 2021
RSS Glasgow Local Group Event, Glasgow, UK (online)	9 Feb. 2021
Statistics Seminar Series of the School of Mathematics and Statistics, Glasgow, UK (online)	29 Jan. 2021
One World Approximate Bayesian Computation (ABC) Seminar, Warwick, UK (online)	29 Oct. 2020
Seminar Series of the Division of Aerodynamics, Warsaw University of Technology, Warsaw, Poland	12 Dec. 2019
3rd Annual Workshop on Financial Econometrics , Örebro, Sweden	11–12 Nov. 2019
10th European Seminar on Bayesian Econometrics [P], St Andrews, UK	2–3 Sep. 2019
International Conference on Statistics: Theory and Applications, Lisbon, Portugal	13–14 Aug. 2019
39th International Symposium on Forecasting, Thessaloniki, Greece	16–19 Jun. 2019
Workshop on Uncertainty Quantification for Cardiac Models [P], Cambridge, UK	5–7 Jun. 2019
Cside 2018 Conference, Glasgow, UK	26 Nov. 2018
2nd Joint Liverpool-Glasgow Maths Healthcare Centre Meeting, Liverpool, UK	30 Aug. 2018
4th Bayesian Young Statisticians Meeting, Warwick, UK	02 – 03 Jul. 2018
12th Netherlands Econometric Study Group Meeting [P], Amsterdam, The Netherlands	25 May 2018
1st Bayes Comp [P], Barcelona, Spain	26– 28 Mar. 2018
10th International Conference of the ERCIM WG on Computational and Methodological Statistics [P], London, UK	16– 18 Dec. 2017
8th European Seminar on Bayesian Econometrics, Maastricht, The Netherlands	26–27 Oct. 2017
Sequential Monte Carlo Workshop 2017 [P], Uppsala, Sweden	30 Aug. – 1 Sep. 2017
1st International Conference on Econometrics and Statistics, Hong Kong	15–17 Jun. 2017
Statistics Seminar Series of the School of Mathematics, Edinburgh, UK	19 May 2017
10th International Conference on Computational and Financial Econometrics, Seville, Spain	9–11 Dec. 2016
3rd Bayesian Young Statisticians Meeting, Florence, Italy	20–21 Jun. 2016
11th Netherlands Econometric Study Group Meeting [P], Leuven, Belgium	17–18 Jun. 2016

Travel Grants, Awards and Scholarships

Örebro University School of Business travel funding (650 EUR) to attend Workshop on Financial Econometrics, Örebro, Sweden	Sep. 2019
International Institute of Forecasters travel award (1660 USD) to attend ISF 2019 and the forecasting summer school	Mar. 2019
Cside 2018 1st place prize (250 GBP) for 2 subcompetitions for SDE models	Nov. 2018
ISBA travel award to attend BAYSM 2018 (400 USD)	Apr. 2018

SMC 2017 scholarship (15,000 SEK ≈ 1600 EUR) Aug. 2017
to attend the SMC 2017 workshop and the intensive course

Tinbergen Institute merit-based scholarship (30,000 EUR)
Tinbergen Institute, full scholarship, 2 years of MPhil Sep. 2013 – Aug. 2015

Student Exchange Scholarship
Warsaw School of Economics, the LLP Erasmus Sep. 2010 – Feb. 2011

Scholarship for excellent academic achievements
Warsaw School of Economics Oct. 2007 – Sep. 2010

Additional Courses and Trainings

Forecasting Summer School
Thessaloniki, Greece Jun. 2019
Probabilistic forecasting (scoring rules, combining predictive distributions)

Scalable Bayesian Inference
Edinburgh, UK Jun. 2018
Scalable algorithms for large datasets (embarrassingly parallel MCMC, approximate MCMC), scalable Bayesian methods for very high-dimensional data analysis

Workshop on Machine Learning Models and Methods for Econometricians
Maastricht, The Netherlands Oct. 2017
Gaussian processes, distributed and subsampling MCMC, variational Bayes, deep learning

Intensive PhD level course on Sequential Monte Carlo Methods
Uppsala University, Sweden Aug. 2017
Particle MCMC, high-dimensional filtering, SMC for probabilistic graphical models and probabilistic programming

Reading Group on Bayesian Nonparametrics
University of Edinburgh, UK May – Jun. 2017
Introduction to Dirichlet process and their mixtures, Bayesian nonparamteric regression

Course on High Performance Computing
VU Amsterdam, The Netherlands Oct. 2016
Basics of Unix and cluster computing, Hadoop and data analytics, GPU programming, HPC cloud

Summer School in Applied Macroeconomics
University of Salento, Lecce, Italy Jul. 2012
Programming in Matlab, VAR for monetary policy, state space models and the Kalman Filter