Veronika Ročková

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Contact Information

Booth School of Business
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Research Interests

Bayesian statistics, inference for AI, generative Bayesian computation and inference, non-parametric Bayes, machine learning, scalable Bayes, high-dimensional decision theory, healthcare data

Professional Experience

University of Chicago, Chicago, USA
Booth School of Business
- Bruce Lindsay Professor in Econometrics and Statistics in the Wallman Society of Fellows, 1/2025-present
- Professor in Econometrics and Statistics, 7/2022-1/2025
- Associate Professor in Econometrics and Statistics, 7/2020-6/2022
- Assistant Professor in Econometrics and Statistics, 7/2016-7/2020

Department of Statistics
- Affiliate Faculty, 1/2023-present

Committee on Quantiative Methods in Social, Behavioral, and Health Sciences
- Faculty Member, 1/2020-present

Center for Applied AI at the Booth School of Business
- Faculty Steering Committee Member, 9/2020-present

Committee on Data Science
- Faculty Member, 10/2023-present

University of Pennsylvania, Philadelphia, USA
The Wharton School, Department of Statistics
- Postdoctoral Research Associate, 9/2013-7/2016

Education

Erasmus University, Rotterdam, The Netherlands
Erasmus Medical Centre
- Ph.D., Biostatistics, 9/2009-11/2013

Charles University, Prague, Czech Republic
School of Mathematics and Physics, Department of Probability and Mathematical Statistics
- M.Sc., Mathematical Statistics, 9/2007-6/2010
- B.Sc., General Mathematics, 9/2004-6/2007

Universiteit Hasselt, Hasselt, Belgium
School of Sciences, Centre for Statistics
- M.Sc., Biostatistics, 9/2008-9/2009

Honors and Awards

- 2024 COPSS Presidents' Award
- COPSS Emerging Leader Award
- NSF CAREER Award, 2020-2025 (400 K)
- James S. Kemper Foundation Faculty Scholar, University of Chicago, 7/2016-1/2025
- Susie Bayarri Lecturer, 7/2018

- First Honorable Mention (runner up) for the 2014 Leonard J. Savage Award for outstanding dissertation in Bayesian statistical theory and methods awarded by ISBA.

Selected Work in Progress

⋆ designates a student

- **AI-Powered Bayesian Inference**.
  O'Hagan⋆, S. and Rockova, V. (2025)
  Manuscript Available
- **IQ BART**.
  O'Hagan⋆, S. and Rockova, V. (2025)
  In Preparation
- **Predictive Inference with the Horseshoe**.
  Zhai⋆, P. and Rockova, V. (2025)
  In Preparation
- **Assessments of Healthcare Equity from Medicare Records**.
  Park, J., Li⋆, J., Adelman, D., Spiegel, T. and Rockova, V. (2023)
  In Preparation

Submitted Work

- **From Small to Large Language Models: Revisiting the Federalist Papers**.
  Jeong⋆, S. and Rockova, V. (2025)
  Harvard Data Science Review (Submitted)
- **Deep Computerized Adaptive Testing**.
  Li⋆, J., Gibbons, R. and Rockova, V. (2025)
  Journal of the American Statistical Association (Submitted)
- **Adaptive Uncertainty Quantification for Generative AI.**
  O'Hagan⋆, S. and Kim, J. and Rockova, V. (2024)
  Journal of Machine Learning Research (Submitted)
- **Tree Bandits for Generative Bayes**.
  O'Hagan⋆, S. and Kim, J. and Rockova, V. (2024)
  Journal of the American Statistical Association (Revision Submitted)
- **Deep Bayes Factors**.
  Kim, J. and Rockova, V. (2023+)
  Statistical Science (Submitted)
- **Adaptive Bayesian Predictive Inference**.
  Rockova, V. (2023+)
  The Annals of Statistics (Revise and Resubmit)
- **On Mixing Rates for Bayesian CART**.
  Kim, J. and Rockova, V. (2023+)
  Electronic Journal of Statistics (Revision Submitted)
- **Adversarial Bayesian Simulation**.
  Wang Y.⋆ and Rockova, V. (2022+)
  Journal of Machine Learning Research (Revise and Resubmit)

Publications

- **Sparse Bayesian Multivariate Item Response Theory**.
  Li⋆, J., Gibbons, R. and Rockova, V. (2025)
  Journal of the American Statistical Association (In Press)
- **Deep Generative Quantile Bayes.**
  Kim, J., Zhai⋆, P. and Rockova, V. (2025)
  Artificial Intelligence and Statistics (AISTATS)(In press)
- **Ideal Bayesian Spatial Adaptation**.
  Rockova, V. and Rousseau, J. (2024)
  Journal of the American Statistical Association, 119, 2078–2091

- **The Art of BART: Minimax Optimality over Non-homogeneous Smoothness in High Dimensions**.
  Jeong, S. and Rockova, V. (2023)
  Journal of Machine Learning Research, 24(337), 1–65
- **Generative Bootstrap for Bayesian Computation**.
  Nie L.* and Rockova, V. (2023)
  Philosophical Transactions of the Royal Society, 381, 1–28
- **Metropolis-Hastings via Classification**.
  Kaji, T. and Rockova, V. (2023)
  Journal of the American Statistical Association, 118, 2533–2547
- **Bayesian Bootstrap Spike-and-Slab LASSO**.
  Nie, L.* and Rockova, V. (2023)
  Journal of the American Statistical Association, 118, 2013–2028
- **Variable Selection via Thompson Sampling**.
  Liu, Y.* and Rockova, V. (2023)
  Journal of the American Statistical Association, 118, 287–304
  Winner of SBSS 2020 Student Paper Competition awarded by ASA
- **Approximate Bayesian Computation via Classification**.
  Wang, Y.*, Kaji, T. and Rockova, V. (2022)
  Journal of Machine Learning Research, 23, 1–49
- **Uncertainty Quantification for Bayesian CART**.
  Castillo, I. and Rockova, V. (2021)
  The Annals of Statistics, 49(6), 3482–3509
- **Adaptive Bayesian SLOPE: Model Selection with Incomplete Data**.
  Jiang, W.*, Bogdan, M., Josse, J., Miasojedow, B., Majewski, S., Rockova, V. and TraumaBase® Group (2022)
  Journal of Computational and Graphical Statistics, 31, 113–137
- **Variable Selection with ABC Bayesian Forests**.
  Liu, Y.*, Rockova, V. and Wang, Y.* (2021)
  Journal of the Royal Statistical Society (Series B), 83(3), 453–481
- **The Median Probability Model and Correlated Variables**.
  Barbieri, M., Berger, J., George, E. and Rockova, V. (2021)
  Bayesian Analysis, 16(4): 1085–1112
- **Dynamic Variable Selection with Spike-and-Slab Process Priors**.
  Rockova, V. and McAlinn, K. (2021)
  Bayesian Analysis, 16(1), 233 –269
- **Spike-and-Slab LASSO Biclustering**.
  Moran, G.*, Rockova, V. and George, E. (2021)
  The Annals of Applied Statistics, 15(1), 148–173
- **Posterior Concentration for Bayesian Regression Trees and Forests**.
  Rockova, V. and van der Pas, S. (2020)
  The Annals of Statistics, 48(4), 2108–2131
- **Spike-and-Slab Meets the LASSO: A Review of the Spike-and-Slab LASSO**.
  Bai, R., Rockova, V. and George, E. (2021)
  Handbook on Bayesian Variable Selection, Chapter 4, 1–28
- **On Semiparametric Inference for BART**.
  Rockova, V. (2020)
  37th International Conference on Machine Learning (ICML), 119, 8137–8146
- **Uncertainty Quantification for Sparse Deep Learning**.
  Wang, Y.* and Rockova, V. (2020)
  Artificial Intelligence and Statistics (AISTATS), 108, 298–308

- **Determinantal Priors for Bayesian Variable Selection**.
  Rockova, V. and George, E. (2020)
  Statistics in the Public Interest–In Memory of Stephen E. Feinberg
- **Regularization via Bayesian Penalty Mixing**.
  Comment on *Ridge Regularization: An Essential Concept in Data Science* by Trevor Hastie
  George, E. and Rockova, V. (2020)
  Technometrics, 62(4), 438–442
- **On Theory for BART**.
  Rockova, V. and Saha, E.* (2019)
  Artificial Intelligence and Statistics (AISTATS), 89, 2839–2848
- **Simultaneous Variable and Covariance Selection with the Multivariate Spike-and-Slab LASSO**.
  Deshpande, S.*, Rockova, V. and George, E. (2019)
  Journal of Computational and Graphical Statistics, 18(4), 921–931
- **On Variance Estimation for Bayesian Variable Selection**.
  Moran, G.*, Rockova, V. and George, E. (2019)
  Bayesian Analysis, 14(4), 1091–1119
- **Bayesian Estimation of Sparse Signals with a Continuous Spike-and-Slab Prior.**
  Rockova, V. (2018)
  The Annals of Statistics, 46(1), 401–437
- **Particle EM for Variable Selection**.
  Rockova, V. (2018)
  Journal of the American Statistical Association, 113(524), 1684–1697
- **Posterior Concentration for Sparse Deep Learning**.
  Polson, N. and Rockova, V. (2018)
  Neural Information Processing Systems (NeurIPS)
- **The Spike-and-Slab LASSO**.
  Rockova, V. and George, E. (2018)
  Journal of the American Statistical Association, 113(521), 431–444
- **Bayesian Dyadic Trees and Histograms for Regression**.
  van der Pas, S. and Rockova, V. (2017)
  Neural Information Processing Systems (NeurIPS)
- **Hospital Mortality Rate Estimation for Public Reporting**.
  George, E., Rockova, V., Rosenbaum, P., Satopaa, V. and Silber, J. (2017)
  Journal of the American Statistical Association, 112(519), 933-947
  Featured in Chicago Booth Review (spring 2018)
- **Fast Bayesian Factor Analysis via Automatic Rotations to Sparsity.**
  Rockova, V. and George, E. (2016)
  Journal of the American Statistical Association, 111(506), 1608-1622
- **Bayesian Penalty Mixing: The Case of a Non-separable Penalty**.
  Rockova, V. and George, E. (2016)
  Statistical Analysis for High-Dimensional Data - The Abel Symposium 2014 Springer Series
- **Improving Medicare's Hospital Compare Mortality Model**.
  Silber, J., Satopaa, V., Mukherjee, N., Rockova, V., Wang, W., Hill, A., Even-Shoshan, O., Rosenbaum, P., and George, E. (2016)
  Health Services Research Journal, 51(2), 1229-1247
- **Determinantal Regularization for Ensemble Variable Selection**.
  Rockova, V., Moran, G.* and George, E. (2016)
  Artificial Intelligence and Statistics (AISTATS) 2016

- **EMVS: The EM Approach to Bayesian Variable Selection.**
  Rockova, V. and George, E. (2014)
  Journal of the American Statistical Association, 109(506), 828-846
- **Negotiating Multi-collinearity with Spike and Slab Priors.**
  Rockova, V. and George, E. (2014)
  Metron, 72(2), 217-229
- **Incorporating Grouping Information in Bayesian Variable Selection with Applications in Genomics.**
  Rockova, V. and Lesaffre, E. (2014)
  Bayesian Analysis, 9(1), 221-258
- **Bayesian Hierarchical Formulations for Selecting Variables in Regression Models.**
  Rockova, V., Lesaffre, E., Luime, J. and Löwenberg, B. (2012)
  Statistics in Medicine, 31(11), 1221-1237

Biomedical Publications

- **Risk-stratification of Intermediate-risk Acute Myeloid Leukemia: Integrative Analysis of a multitude of gene mutation and expression** markers.
  Rockova, V., Abbas, S., Wouters, B., Erpelinck, C., Beverloo, B., Delwel, R., van Putten, W., Löwenberg, B. and Valk, P.
  Blood (2011), 118(4), 1069-1076
- **The Prognostic Relevance of miR-212 Expression with Survival in Cytogenetically and Molecularly Heterogeneous AML.**
  Sun, S., Rockova, V., Bullinger, L., Dijkstra, M., Döhner, H., Löwenberg, B., Lavrencic, M.
  Leukemia (2013), 27(1), 100-106
- **Mutant DNMT3A: a Marker of Poor Prognosis in Acute Myeloid Leukemia.**
  Ribeiro, A., Pratcorona, M., Erpelinck, C., Rockova, V., Sanders, M., Abbas, S., Figueroa, M., Zeilemaker, Z., Melnick ,A., Löwenberg, B., Valk, P. and Delwel, R.
  Blood (2012), 119(24), 5824-5831
- **Retroviral Integration Mutagenesis in Mice and Comparative Analysis in Human AML Identify Reduced PTP4A3 Expression as a Prognostic Indicator.**
  Beekman, E., Valkhof, M., Erkeland, S., Taskesen, E., Rockova, V., Peeters, J., Valk, P., Löwenberg, B. and Touw, I.
  PLoS ONE (2011), 6(10), e26537
- **Deregulated Expression of EVI1 Defines a Poor Prognostic Subset of MLL-Rearranged Acute Myeloid Leukemias.**
  Groschel, S., Schlenk,R., Engelmann, J., Rockova, V., Teleanu, V., Kühn, M., Eiwen, K., Erpelinck, C., Havermans, M., Lubbert, M., Germing, U., Schmidt-Wolf, I., Beverloo, B., Schuurhuis, G., Bargetzi, M., Krauter, J., Ganser, A., Valk, P., Löwenberg, B., Döhner, K., Döhner, H. and Delwel, R.
  Journal of Clinical Oncology (2013), 31(1), 95-103

Selected Invited Seminar Talks

- (2024) University of Chicago (Statistics), Brown, Columbia, NYU, Vrije University Amsterdam (van Danzig seminar)
- (2023) HEC Montreal, Charles University
- (2022) University of Chicago (Committee on Quantitative Methods Seminar), Michigan State University, Clemson University
- (2021) University of Warwick (One World ABC Seminar), Stanford, Wharton, University of Amsterdam, University of Oxford, University of Lancaster
- (2020) University of Massachusetts, University of Bristol, Princeton
- (2019) University of Cambridge, University of Oxford, Ohio State, Texas A&M, University of Chicago (ML seminar), Michigan State University, University of Chicago (Committee on Quantitative Methods Seminar)

- (2018) Vienna University of Economics and Business, University of Florida, Argonne Labs, Princeton, ENSAE ParisTech, Sorbonne Université
- (2017) Wharton, University of Washington (Microsoft Distinguished Talk), University of Michigan, Leiden University
- (2016) Federal Reserve Bank of Cleveland Yale University, Stanford University, Columbia University, Carnegie Mellon University, The University of Texas at Austin, Boston University, MIT Sloan, University of Chicago, Duke University, Harvard University, Johns Hopkins University
- (2015) Wharton, Harvard University
- (2014) University of Pennsylvania (Econ), Duke University, University of Toronto, Johns Hopkins University
- (2013) Rice University
- (2012)University of Pennsylvania

Professional Activities

- **Associate Editor**: The Annals of Statistics (1/2022-present), Journal of the American Statistical Association (1/2023-present), Journal of the Royal Statistical Society (1/2023-present), Operations Research (11/2023-present)
- **SBSS Program Chair**: 2020 Program Chair of the Section on Bayesian Statistical Science (SBSS) of the American Statistical Association
- **Organizer**: IMS invited session at JSM 2019, JSM 2014. ISBIS 2017 invited session
- **Member**: International Society for Bayesian Analysis (ISBA) (2012-present), American Statistical Association (ASA) (2012-present), Institute of Mathematical Statistics (IMS) (2016-present)

Teaching

- **University of Chicago**: Booth School of Business
  - Big Data (BUS 41201), University of Chicago, Spring 2017-present
- **University of Pennsylvania** : Wharton
  - *Stat 542: Bayesian Methods and Computation*: Guest lecturer 4/2015
- **Erasmus University**: taught recitation sections, designed and graded projects, guest lecturer
  - *Bayesian Methods* 2010-2012
  - *Longitudinal Data Analysis* 2010-2012
  - *Classical Statistical Methods* 2010-2012
  - *Modern Statistical Methods* 2010-2012

Students and Researchers Advised

- **Sowon Jeong** (*PhD advisor*)
  2nd year PhD student in Econometrics and Statistics at the University of Chicago (Booth School of Business)
- **Percy Zhai** (*PhD co-advisor*)
  4th year PhD student in Econometrics and Statistics at the University of Chicago (Booth School of Business)
- **Jiguang Li** (*PhD advisor*)
  3rd year PhD student in Econometrics and Statistics at the University of Chicago (Booth School of Business)
- **Sean O'Hagan** (*PhD advisor*)
  3rd year PhD student at the University of Chicago (Department of Statistics)
- **Jungeum Kim**
  Current Principal Postdoctoral Researcher
- **Yuexi Wang** (*PhD co-advisor*)
  Former PhD student in Econometrics and Statistics at Chicago Booth, now tenure-track faculty at the Department of Statistics at the University of Illinois Urbana-Champaign
- **Enakshi Saha** (*PhD advisor*)
  Former PhD student at the University of Chicago (Department of Statistics)

- **Yi Liu** (*PhD advisor*)
  Former PhD student at the University of Chicago (Department of Statistics)
- **Lizhen Nie** (*PhD co-advisor*)
  Former PhD student at the University of Chicago (Department of Statistics)
  Now quantitative researcher at TwoSigma
- **Seonghyun Jeong**
  Former Senior (Postdoctoral) Research Professional at Chicago Booth
  Now tenure-track faculty at Seoul National University
- **Kenichiro McAlinn**
  Former Senior (Postdoctoral) Research Professional at Chicago Booth
  Now tenure-track faculty at the Fox Booth of Business of the Temple University
- **Gemma Moran** (*PhD co-advisor*)
  Former PhD student at Wharton (Department of Statistics)
  Now tenure-track faculty at Rutgers
- **Deshpande Sameer** (*PhD co-advisor*)
  Former PhD student at the Wharton (Department of Statistics)
  Now tenure-track faculty at the Statistics Department at UW-Madison
- **Stephanie van der Pas** (*PhD thesis defense committee member*)
  Now assistant professor at Amsterdam UMC, Department of Epidemiology and Data Science

Grant Support

- NSF grant DMS-1944740, PI: Veronika Rockova
- NSF grant DMS-1406563, PI: Edward I. George; collaborator and coauthor of the grant proposal
- AHRQ grant R21-HS021854, PI: Jeffrey Silber; collaborator

Miscellany

- Languages: Czech/Slovak, English, Dutch, French (passive), Matlab, C++, R, Stata, SAS, LaTeX
- Piano: Classical music training since the age of 6
- Avid tennis player and golf neophyte