Veronika Ročková

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Research Interests

Bayesian statistics, variable selection, machine learning, scalable Bayes for massive data, non-parametric Bayes, frequentist assessments of Bayesian procedures, high-dimensional inference, sparse techniques in multivariate analysis, non-convex optimization and penalized likelihood methods

Professional Experience

University of Chicago, Chicago, USA
Booth School of Business
☐ Associate Professor in Econometrics and Statistics, 7/2020-present
☐ Assistant Professor in Econometrics and Statistics, 7/2016-present

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

■ NSF CAREER Award, 2020-2025 (400 K)

■ James S. Kemper Foundation Faculty Scholar, University of Chicago, 7/2016-present.

■ Susie Bayarri Lecturer, 7/2018. This lecture is delivered at the International Society for Bayesian Analysis (ISBA) World Meetings by an outstanding young researcher under 35 years of age.

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

■ Erasmus University: Graduated with "Cum Laude" (awarded annually to 5/200 graduate students)

- Hasselt University: Erasmus Stipend Fellowship granted by European Union (2008-2009), graduated with honors "Magna Cum Laude".

SELECTED WORK IN PROGRESS
⋆ *designates a student*

- ABC via Classification.
  Wang, Y.⋆, Kaji, T. and Rockova, V. *(Work in Progress)*

SUBMITTED WORK

- Ideal Bayesian Spatial Adaptation.
  Rockova, V. and Rousseau J. (2021) *(Submitted)*

- Metropolis-Hastings via Classification.
  Kaji, T. and Rockova, V. (2021) *(Submitted)*

- Fast Posterior Sampling for the Spike-and-Slab LASSO.
  Nie, L.⋆ and Rockova, V. (2020)
  Journal of the American Statistical Association (Revision Submitted)

- The Art of BART.
  Jeong, S. and Rockova, V. (2020) *(Submitted)*

- Dynamic Sparse Factor Analysis.
  Saha, E.⋆ and Rockova V. (2018+)
  Journal of Applied Econometrics (Revision Submitted)

PUBLICATIONS

- Uncertainty Quantification for Bayesian CART.
  Castillo, I. and Rockova, V. (2021)
  The Annals of Statistics (In Press)

- Adaptive Bayesian SLOPE – High-dimensional Model Selection with Missing Values.
  Jiang, W.⋆, Bogdan, M., Josse, J., Miasojedow, B., Rockova, V. and TraumaBase Group (2021)
  Journal of Computational and Graphical Statistics (In Press)

- Variable Selection via Thompson Sampling.
  Liu, Y.⋆ and Rockova, V. (2021)
  Winner of SBSS 2020 Student Paper Competition awarded by ASA
  Journal of the American Statistical Association (In Press)

- Variable Selection with ABC Bayesian Forests.
  Liu, Y.⋆, Rockova V. and Wang, Y.⋆ (2021)
  Journal of the Royal Statistical Society (Series B) (In Press)

- The Median Probability Model and Correlated Variables.
  Barbieri, M., Berger, J., George, E. and Rockova V. (2021)
  Bayesian Analysis (In Press)

- 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

- On Semiparametric Inference for BART.
Rockova V. (2020)
International Conference on Machine Learning (ICML),119, 8137–8146

- Spike-and-Slab Meets the LASSO: A Review of the Spike-and-Slab LASSO.
Bai, R., Rockova V. and George, E. (2020)
Handbook on Bayesian Variable Selection (In Press)

- Uncertainty Quantification for Sparse Deep Learning.
Wang Y.[*] and Rockova V. (2020)
23rd Conference on 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 (In Press)

- 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)
22nd Conference on 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)
32nd Annual Conference on Neural Information Processing Systems (NeurIPS) 2018

- 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)
  31st Annual Conference on Neural Information Processing Systems (NeurIPS) 2017

- 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), 1229-47

- Determinantal Regularization for Ensemble Variable Selection.
  Rockova V., Moran G.⋆ and George E. (2016)
  19th Conference on 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

CONFERENCE PROCEEDINGS

- Fast EM Inference for Bayesian Factor Analysis with Indian Buffet Process Prior.
  Rockova V. and George E. (2014)
  Proceedings of 47th Scientific Meeting of Italian Statistical Society

- Dual Coordinate Ascent EM for Bayesian Variable Selection.
  George E., Rockova V. and Lesaffre E. (2013)
  Proceedings of 28th International Workshop in Statistical Modeling, ISBN: 978-88-96251-47-8, 165-171

- Sparse Bayesian Factor Regression Approach to Genomic Data Integration.
  Rockova V. and Lesaffre E. (2013)
  Proceedings of 28th International Workshop in Statistical Modeling, ISBN: 978-88-96251-47-8, 337-343

- Incorporating Prior Biological Knowledge in Bayesian Modeling of Sparse Networks.
  Rockova V. and Lesaffre E. (2012)
  Proceedings of 27th International Workshop in Statistical Modeling, ISBN: 978-80-263-0250-6, 291-296

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.J., 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., Jongen-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

INVITED SEMINAR TALKS

- One World ABC Seminar	5/2021
- Stanford University, Department Statistics	3/2021
- Wharton, Department Statistics	2/2021
- Bayes Club	2/2021
- University of Oxford, Department Statistics	2/2021

- University of Lancaster, Department Statistics — 1/2021
- University of Massachusetts, Department of Mathematics and Statistics — 11/2020
- University of Bristol, Department of Statistical Science — 10/2020
- Princeton, Operations Research and Financial Enegineering — 2/2020
- University of Cambridge, Department of Statistics — 11/2019
- University of Oxford, Department of Statistics — 11/2019
- Ohio State, Department of Statistics — 10/2019
- Texas A&M, Department of Statistics — 3/2019
- University of Chicago, Machine Learning Seminar — 2/2019
- Michigan State University, Department of Statistics — 1/2019
- University of Chicago, Workshop on Quantitative Methods in Education, Health and Social Sciences — 1/2019
- Vienna University of Economics and Business — 12/2018
- University of Florida, Department of Statistics — 10/2018
- Argonne Labs — 10/2018
- Princeton, Center for Statistics and Machine Learning — 2/2018
- ENSAE ParisTech, Center for Research in Economics and Statistics — 1/2018
- Sorbonne Université, Laboratoire de Probabilités, Statistique et Modélisation — 1/2018
- Wharton, Department of Statistics — 11/2017
- University of Washington (*Microsoft Distinguished Talk*), Department of Statistics — 10/2017
- University of Michigan, Department of Biostatistics — 9/2017
- Leiden University, Institute of Mathematics — 2/2017
- Federal Reserve Bank of Cleveland — 9/2016
- Yale University, Department of Statistics — 2/2016
- Stanford University, Department of Statistics — 2/2016
- Columbia University, Department of Statistics — 2/2016
- Carnegie Mellon University, Department of Statistics — 2/2016
- The University of Texas at Austin, Department of Statistics — 1/2016
- Boston University, Department of Mathematics and Statistics — 1/2016
- MIT, Sloan School of Business — 1/2016
- University of Chicago, Booth School of Business — 1/2016
- University of Chicago, Department of Statistics — 1/2016
- Duke University, Department of Statistical Science — 1/2016
- Harvard University, Department of Biostatistics — 1/2016

- Johns Hopkins University, Department of Biostatistics   12/2015
- University of Pennsylvania, Department of Biostatistics   12/2015
- Harvard University, Department of Statistics   11/2015
- University of Pennsylvania, Department of Economics, Econometrics Workshop   11/2014
- Duke University, Department of Statistical Science   10/2014
- University of Toronto, Department of Statistical Sciences   3/2014
- Johns Hopkins University, Department of Biostatistics, SMART colloquium   1/2014
- Rice University, Department of Statistics   10/2013
- University of Pennsylvania, Department of Statistics   10/2012

INVITED
CONFERENCE
TALKS

- CQA (Chicago Quantitative Alliance)   Chicago, 9/2019
- 10th European Seminar on Bayesian Econometrics (*Keynote Lecture*)   St. Andrews, 9/2019
- Workshop on Higher Order Asymptotics and Post-selection Inference   St. Louis, 8/2019
- SAMSI Opening Workshop on Deep Learning   Duke, 8/2019
- Joint Statistical Meeting (*IMS Invited Lecture*)   Denver, 8/2019
- Statistics and Data Science Symposium (UCSD)   San Diego, 1/2019
- Young Researchers Conference (Wharton, University of Pennsylvania)   Philadelphia, 11/2018
- Fields Institute in Toronto
  Statistical Inference, Learning and Models in Data Science Workshop   Toronto, 9/2018
- Suzie Bayarri Lecture at ISBA World Meeting (*Keynote Named Lecture*)   Edinburgh, 7/2018
- EBEB XIV (*Plenary Speaker*) 14th Encontro Brasileiro de Estatística
  Bayesiana   Rio de Janeiro, 3/2018
- 11th International Conference on Computational and Financial Econometrics   London, 12/2017
- 12th International Workshop on Objective Bayes Methodology   Austin, 12/2017
- Joint Statistical Meeting: *IMS Lecture*   Baltimore, 8/2017
- 31st European Meeting of Statisticians   Helsinki, 7/2017
- 11th Conference on Bayesian Nonparametrics   Paris, 6/2017
- ISBIS 2017: IBM Statistics in Business Analytics   IBM, New York, 6/2017
- 10th International Conference on Computational and Financial Econometrics   Seville, 12/2016
- Latent Variables 2016   University of South Carolina, 10/2016
- Joint Statistical Meeting: *Invited Session*   Chicago, 8/2016
- 14th International Society for Bayesian Analysis World Meeting   Sardinia, 6/2016
- BFF: Fusion Meeting   Rutgers, 3/2016
- 9th International Conference on Computational and Financial Econometrics   London, 12/2015
- Joint Statistical Meeting: *IMS Lecture*   Seattle, 8/2015

■ Joint Statistical Meeting: *Savage Award Finalist Session*	Seattle, 8/2015
■ 30th European Meeting of Statisticians: *Session on Statistical Genomics*	Amsterdam, 7/2015
■ 11th International Workshop on Objective Bayes Methodology	Valencia, 6/2015
■ Joint Statistical Meeting: *IMS Lecture*	Boston, 8/2014
■ 12th International Society for Bayesian Analysis World Meeting	Cancun, 7/2014
■ 47th Scientific Meeting of the Italian Statistical Society	Cagliari, 7/2014
■ 10th International Workshop on Objective Bayes Methodology: *Discussant*	Durham, 10/2013
■ Joint Statistical Meeting: *Topic Invited Session*	Montreal, 8/2013
■ Workshop on Bayesian Nonparametrics	Leiden, 6/2013
■ BAYES 2013	Rotterdam, 5/2013
■ International Hexa-Symposium	Hasselt, 5/2013
■ Spring Symposium in Biostatistics	Rotterdam, 5/2013

CONTRIBUTED TALKS AND POSTERS

■ NeurIPS 2018	Montreal, 12/2018
■ NeurIPS 2017	Long Beach, 12/2017
■ Opening Workshop on Optimization, SAMSI	Durham, 8/2006
■ 28th International Workshop on Statistical Modelling	Pallermo, 7/2013
■ 33rd Conference of the International Society for Clinical Biostatistics	Bergen, 8/2012
■ 27th International Workshop on Statistical Modelling	Prague, 6/2012
■ 6th Dutch Hematology Congress	Arnhem, 2/2012
■ 31st Conference of the International Society for Clinical Biostatistics	Montpelier, 9/2010
■ 5th IMS-ISBA joint meeting	Chamonix, 1/2014
■ High-Dimensional Inference with Applications	Canterburry, 8/2012
■ 9th Conference on Bayesian Nonparametrics	Amsterdam, 6/2013

PROFESSIONAL ACTIVITIES

■ **SBSS Program Chair**: 2020 Program Chair of the Section on Bayesian Statistical Science (SBSS) of the American Statistical Association

■ **Associate Editor**: Bayesian Analysis (12/2017-present)

■ **Reviewer**: The Annals of Statistics, Journal of the American Statistical Association (Theory and Methods), Journal of Computational and Graphical Statistics, Statistical Science, Electronic Journal of Statistics, Bernoulli

■ **Organizer**: IMS invited session at JSM 2019 (Denver), IMS invited session at JSM 2014 (Boston), 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** □ *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

■ Enakshi Saha (*PhD advisor*)
5th year PhD student at the University of Chicago statistics department (forthcoming postdoctoral researcher at Harvard University)

■ Yi Liu (*PhD advisor*)
4th year PhD student at the University of Chicago statistics department

■ Lizhen Nie (*PhD co-advisor*)
4rd year PhD student at the University of Chicago statistics department

■ Yuexi Wang (*PhD co-advisor*)
3nd year PhD student in Econometrics and Statistics at Chicago Booth

■ Seonghyun Jeong
Senior Research Professional at Chicago Booth, now tenure-track faculty at Seoul National University

■ Kenichiro McAlinn
Former Senior 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 statistics department, now postdoc at Columbia University

■ Deshpande Sameer (*PhD co-advisor*):
former PhD student at the Wharton statistics department, forthcoming tenure-track faculty at the Statistics Department at UW-Madison

■ Stephanie van der Pas (*PhD thesis defense committee member*)
now faculty at the Mathematics Institute at Leiden University

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

COMPUTER SKILLS

■ Statistical: R/S-Plus, WinBUGS, Stata, SAS, SPSS
■ Languages: Matlab, C/C++
■ LaTeX, unix shell scripts

MISCELLANY

■ Languages: Czech/Slovak, English, Dutch, French (passive knowledge)
■ Playing piano: Classical music training since the age of 6