Willem van den Boom

30 Medical Drive, Brenner Centre for Molecular Medicine, Singapore 117609
Email: willem@wvdboom.nl

Education

Duke University, Department of Statistical Science

Ph.D. in Statistical Science 2018
Certificate in College Teaching 2018
M.S. in Statistical Science 2016

Dissertation: Tailored scalable dimensionality reduction
Advisors: David B. Dunson and Galen Reeves

Utrecht University, University College Roosevelt

B.Sc. in Liberal Arts and Sciences 2014

Major in Mathematics, Computer Science, and Physics
Minor in Methods & Statistics

Academic positions

Agency for Science, Technology and Research (A*STAR), Institute for Human Development and Potential, Singapore

Scientist 2024 – 2025
Visiting Fellow 2020 – 2021

National University of Singapore, Yong Loo Lin School of Medicine

Senior Research Fellow 2021 – 2024

National University of Singapore, Yale-NUS College, Division of Science

Senior Research Fellow 2021
Research Fellow 2020 – 2021
Lecturer 2019 – 2020
Research Fellow 2019

National University of Singapore, Department of Statistics and Data Science

Research Fellow 2018 – 2019

Research grants

Principal Investigator, 'Optimal treatment target identification from longitudinal electronic medical records', National Medical Research Council, Young Individual Research Grant, S$298,000 2020 – 2024

Publications: Peer reviewed

1. Cremaschi, A., van den Boom, W., Ng, N.B.H., Franzolini, B., Tan, K.B., Yen, J.C.K., Tan, K.H., Chong, Y.-S., Eriksson, J.G., De Iorio, M. (2025). Postpartum screening for type 2 diabetes in women with a history of gestational diabetes mellitus: A cost-effectiveness analysis in Singapore. *Value in Health Regional Issues*, 45, 101048. doi:10.1016/j.vhri.2024.101048
2. van den Boom, W., De Iorio, M., Qian, F., and Guglielmi, A. (2024). The Multivariate Bernoulli detector: Change point estimation in discrete survival analysis. *Biometrics*, 80(3), ujae075. doi:10.1093/biomtc/ujae075
3. Qian, F., van den Boom, W., and See, K.C. (2024). The new global definition of acute respiratory distress syndrome: Insights from the MIMIC-IV database. *Intensive Care Medicine*, 50(4), 608–609. doi:10.1007/10.1007/s00134-024-07383-x
4. Saini, S., Manai, G., van den Boom, W., De Iorio, M., and Qian, F. (2024). Invoice level forecasting with discrete survival methods for effective forecasting of account receivables in supply chain. *Discover Analytics*, 2, 5. doi:10.1007/s44257-024-00013-2
5. Natarajan, A., van den Boom, W., Odang, K.B., and De Iorio, M. (2024). On a wider class of prior distributions for graphical models. *Journal of Applied Probability*, 61(1), 230–243. doi:10.1017/jpr.2023.33
6. Feng, S.F., van den Boom, W., De Iorio, M., Thng, G.J., Chan, J.K.Y., Chen, H.Y., Tan, K.H., and Kee, M.Z.L. (2024). Joint modelling of mental health markers through pregnancy: A Bayesian semiparametric approach. *Journal of Applied Statistics*, 51(2), 388–405. doi:10.1080/02664763.2022.2154329
7. van den Boom, W., De Iorio, M., and Beskos, A. (2023). Bayesian learning of graph substructures. *Bayesian Analysis*, 18(4), 1311–1339. doi:10.1214/22-BA1338
8. Qian, F., van den Boom, W., and See, K.C. (2023). Real-world evidence challenges controlled hypoxemia guidelines for critically ill patients with chronic obstructive pulmonary disease. *Intensive Care Medicine*, 49(9), 1133–1135. doi:10.1007/s00134-023-07166-w
9. Young, A.L., van den Boom, W., Schroeder, R.A., Krishnamoorthy, V., Raghunathan, K., Wu, H.T., and Dunson, D.B. (2023). Mutual information: Measuring nonlinear dependence in longitudinal epidemiological data. *PLOS ONE*, 18(4), e0284904. doi:10.1371/journal.pone.0284904
10. Franzolini, B., Cremaschi, A., van den Boom, W., and De Iorio, M. (2023). Bayesian clustering of multiple zero-inflated outcomes. *Philosophical Transactions of the Royal Society A*, 381(2247), 20220145. doi:10.1098/rsta.2022.0145

11. van den Boom, W., Beskos, A., and De Iorio, M. (2022). The G-Wishart weighted proposal algorithm: Efficient posterior computation for Gaussian graphical models. *Journal of Computational and Graphical Statistics*, 31(4), 1215–1224. doi:10.1080/10618600.2022.2050250
12. van den Boom, W., Jasra, A., De Iorio, M., Beskos, A., and Eriksson, J.G. (2022). Unbiased approximation of posteriors via coupled particle Markov chain Monte Carlo. *Statistics and Computing*, 32(3), 36. doi:10.1007/s11222-022-10093-3
13. van den Boom, W., De Iorio, M., and Tallarita, M. (2022). Bayesian inference on the number of recurrent events: A joint model of recurrence and survival. *Statistical Methods in Medical Research*, 31(1), 139–153. doi:10.1177/09622802211048059
14. Lysaght, T., Ballantyne, A., Toh, H.J., Lau, A., Ong, S., Schaefer, O., Shiraishi, M., van den Boom, W., Xafis, V., and Tai, E.S. (2021). Trust and trade-offs in sharing data for precision medicine: A national survey of Singapore. *Journal of Personalized Medicine*, 11(9), 921. doi:10.3390/jpm11090921
15. van den Boom, W., Reeves, G., and Dunson, D.B. (2021). Approximating posteriors with high-dimensional nuisance parameters via integrated rotated Gaussian approximation. *Biometrika*, 108(2), 269–282. doi:10.1093/biomet/asaa068
16. van den Boom, W., Hoy, M., Sankaran, J., Liu, M., Chahed, H., Feng, M., and See, K.C. (2020). The search for optimal oxygen saturation targets in critically ill patients: Observational data from large ICU databases. *Chest*, 157(3), 566–573. doi:10.1016/j.chest.2019.09.015
17. van den Boom, W., Mao, C., Schroeder, R.A., and Dunson, D.B. (2018). Extrema-weighted feature extraction for functional data. *Bioinformatics*, 34(14), 2457–2464. doi:10.1093/bioinformatics/bty120
18. van den Boom, W., Schroeder, R.A., Manning, M.W., Setji, T.L., Fiestan, G., and Dunson, D.B. (2018). Effect of A1C and glucose on postoperative mortality in noncardiac and cardiac surgeries. *Diabetes Care*, 41(4), 782–788. doi:10.2337/dc17-2232
19. van den Boom, W., Dunson, D., and Reeves, G. (2015). Quantifying uncertainty in variable selection with arbitrary matrices. *IEEE 6th International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, 385–388. doi:10.1109/CAMSAP.2015.7383817

Publications: Not peer reviewed

1. Qian, F., van den Boom, W., and See, K.C. (2024). The new global definition of ARDS loses one of the first games: A chromatic advice. Author's reply. *Intensive Care Medicine*, 50(6), 1003–1005. doi:10.1007/s00134-024-07457-w

2. Qian, F., van den Boom, W., and See, K.C. (2023). Different oxygenation targets for stable COPD and acute exacerbations in the ICU. Author's reply. *Intensive Care Medicine*, 49(11), 1430–1432. doi:10.1007/s00134-023-07229-y
3. van den Boom, W., Hoy, M., Sankaran, J., Liu, M., Chahed, H., Feng, M., and See, K.C. (2020). Response to letter to the editor. *Chest*, 158(3), 1287–1288. doi:10.1016/j.chest.2020.04.023
4. van den Boom, W., and Thiery, A. H. (2020). EP-IS: Combining expectation propagation and importance sampling for Bayesian nonlinear inverse problems. In: *Proceeding. ISI World Statistics Congress 2019. Contributed Paper Session. (Volume 2)*, pp. 145–152.

Publications: Preprint

1. van den Boom, W., Cremaschi, A., and Thiery, A.H. (2024). Doubly adaptive importance sampling. doi:10.48550/arXiv.2404.18556
2. De Iorio, M., van den Boom, W., Beskos, A., Jasra, A., and Cremaschi, A. (2023). Graph of graphs: From nodes to supernodes in graphical models. doi:10.48550/arXiv.2310.11741
3. van den Boom, W., Reeves, G., and Dunson, D.B. (2015). Scalable approximations of marginal posteriors in variable selection. doi:10.48550/arXiv.1506.06629

Honors & awards

Best Student/Postdoc Contributed Paper Award. 2021 World Meeting of the International Society for Bayesian Analysis, 2021.

Fulbright Grant. Fulbright Foreign Student Program, 2014.

Graduated Summa Cum Laude. Utrecht University, University College Roosevelt, 2014.

Invited talks

1. The Multivariate Bernoulli detector: Change point detection in discrete survival analysis. *Satellite Workshop to ISBA World Meeting 2024*, Lugano, Switzerland, 2024.
2. Bayesian computation and learning of substructures in Gaussian graphical models. *Business Analytics Seminar*, University of Amsterdam, Amsterdam Business School, the Netherlands, 2023.
3. The Multivariate Bernoulli detector: Change point detection in discrete survival analysis. *16th International Conference of the ERCIM WG on Computational and Methodological Statistics and 17th International Conference on Computational and Financial Econometrics*, Berlin, Germany, 2023.

4. The G-Wishart weighted proposal algorithm: Efficient posterior computation for Gaussian graphical models. *6th International Conference on Econometrics and Statistics*, Tokyo, Japan, 2023.
5. Bayesian learning of graph substructures. *Statistics Across Campuses Seminar*, Australia, 2022.
6. Unbiased approximation of posteriors via coupled particle Markov chain Monte Carlo. *15th International Conference on Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing*, Linz, Austria, 2022.
7. The G-Wishart weighted proposal algorithm: Efficient posterior computation for Gaussian graphical models. *2022 World Meeting of the International Society for Bayesian Analysis*, Montreal, Canada, 2022.
8. Bayesian joint modelling of recurrence and survival: A conditional approach. *13th International Conference of the ERCIM WG on Computational and Methodological Statistics and 14th International Conference on Computational and Financial Econometrics*, London, United Kingdom, 2020.
9. Approximating high-dimensional posteriors with nuisance parameters via integrated rotated Gaussian approximation. *Bayesian Computation for High-Dimensional Statistical Models*, Institute of Mathematical Sciences, National University of Singapore, 2018.
10. Scalable posterior approximations of marginal posteriors in variable selection. *2017 Joint Statistical Meetings*, Baltimore, MD, United States, 2017.

Contributed talks

1. Bayesian learning of graph substructures. *13th International Conference on Bayesian Nonparametrics*, Puerto Varas, Chile, 2022.
2. Bayesian learning of graph substructures. *Bayesian Young Statisticians Meeting*, Montreal, Canada, 2022.
3. Stein adaptive importance sampling. *2021 World Meeting of the International Society for Bayesian Analysis*, online, 2021.
4. EP-IS: Combining expectation propagation and importance sampling for Bayesian nonlinear inverse problems. *62nd ISI World Statistics Congress*, Kuala Lumpur, Malaysia, 2019.

Poster presentations

1. EP-IS: Combining expectation propagation and importance sampling for Bayesian nonlinear inverse problems. *12th Conference on Bayesian Nonparametrics*, Oxford, United Kingdom, 2019.
2. Flexible Bayesian feature extraction from varying length functional data. *11th Conference on Bayesian Nonparametrics*, Paris, France, 2017.

3. Effect of A1c and glucose on postoperative mortality in non-cardiac versus cardiac surgeries. *American Diabetes Association's 77th Scientific Sessions*, San Diego, CA, United States, 2017.
4. Scalable posterior approximation. *Laboratory for Analytic Sciences Symposium*, Raleigh, NC, United States, 2016.
5. Scalable posterior approximation in variable selection. *IEEE 6th International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Cancun, Mexico, 2015.
6. Scalable posterior approximation in variable selection. *Laboratory for Analytic Sciences Symposium*, Raleigh, NC, United States, 2015.

Teaching experience

National University of Singapore, Yale-NUS College

Instructor of Record. Introduction to Data Science 2019 – 2020
Responsible for the design of this new course

Instructor of Record. Quantitative Reasoning 2019

Duke University

Instructor of Record. Data Analysis and Statistical Inference 2017
Full credit course taught online

Teaching Assistant. Bayesian Methods and Modern Statistics 2017

Project Manager and Mentor. Data+ 2017
Summer research experience for students

Teaching Assistant. Data Analysis and Statistical Inference 2016

Utrecht University, University College Roosevelt

Teaching Assistant. Mathematical Ideas & Methods in Context 2014

Research experience

Research Assistant 2017 – 2018
Duke University, Department of Statistical Science

Accenture Fellow 2015 – 2017
Duke University, Rhodes Information Initiative at Duke

Service: To NUS

Representative of the Division of Biomedical Data Science, Department of Paediatrics, 2021 – 2024

Paediatrics Department Safety and Health Committee, 2021 – 2024

Maintenance of the website for the Mathematical, Computational & Statistical Sciences major, Yale-NUS College, 2019 – 2020

Evaluation Committee for Student-Initiated Research Projects of the Summer Research Programme, Yale-NUS College, 2020

Academic Sampler at the Experience Yale-NUS Weekend, 2019

Service: Other

Associate Editor, Statistics and Computing, 2023 – present

Bayesian Nonparametrics Networking Workshop, local organizing committee, 2024

Organizer of the invited session *Advances in Monte Carlo methods for Bayesian inference* at the conference of the Eastern Asia Chapter of the International Society for Bayesian Analysis (EAC-ISBA Conference 2024), Hong Kong, 2024

Committee for the student paper competition of the Section on Bayesian Statistical Science of the American Statistical Association, 2024

Bayesian Young Statisticians Meeting, scientific committee, 2023

junior-ISBA board, Secretary, 2020 – 2021

UTC+ Scientific Committee of the Blackwell-Rosenbluth Award, j-ISBA liaison, 2021

Reviewer for the Duke Datathon, 2021

Bayesian Young Statisticians Meeting, organizing committee, 2021

Bayesian Young Statisticians Meeting: Online, organizing and scientific committee, 2020

ASA DataFest@Duke, VIP Consultant, 2015 – 2017

Graduate Consultative Committee, 2015 – 2016
Duke University, Department of Statistical Science

Journal reviews: Electronic Journal of Statistics, Bayesian Analysis, Frontiers in Applied Mathematics and Statistics, Journal of Computational and Graphical Statistics, Journal of the Korean Statistical Society, SIAM/ASA Journal on Uncertainty Quantification, Stat, Statistical Methods in Medical Research, Statistics and Computing

Postdoc supervision

Fang Qian, 2022 – 2024

Summer research supervision	Madhumitha Ayyappan, 2020 Jia Tang, 2020
Capstone supervision	Ahmed Elsayed Gobba, 2019 – 2020 Haroun Chahed, 2019 – 2020 Sunwoo Nam, 2019 – 2020
Independent study supervision	Callie Mao, 2015 – 2016 Gic-Owens Fiestan, 2015 – 2016
Software	Programming languages: Python, R and C++ github.com/willemvandenboom van den Boom, W. (2018) `xwf`: An R package for extrema-weighted feature extraction for varying length functional data.
Professional affiliations	International Society for Bayesian Analysis International Statistical Institute