

SINEAD A. WILLIAMSON

Department of Statistics and Data Science ◊ University of Texas at Austin

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EDUCATION

University of Cambridge Ph.D. in Engineering (Machine Learning) Thesis: <i>Nonparametric Bayesian models for dependent data</i> Advisor: Zoubin Ghahramani	2006 - 2012
University College London M.Sc. in Physics (Distinction) Thesis: <i>Light injection calibration for NEMO 3</i>	2005 - 2006
University of Oxford M.Eng in Engineering Science (First Class Honours) Thesis: <i>Lexicographic text analysis using non-negative factorisation techniques</i>	2001 - 2005

POSITIONS

Assistant Professor, University of Texas at Austin Department of Statistics and Data Science Department of Information, Risk and Operations Management	08/2013 – present 08/2013 – 08/2020
Lead Research Scientist, CognitiveScale*	07/2019 – 08/2020
Senior Research Scientist, Amazon, LLC*	08/2018 – 05/2019
Postdoctoral researcher, Carnegie Mellon University Machine Learning Department Advisor: Eric Xing Research direction: Scalable inference for Bayesian nonparametrics	09/2011 – 08/2013
EPSRC PhD Plus research associate, University of Cambridge Department of Engineering Advisor: Zoubin Ghahramani Research direction: Dependent nonparametric processes	12/2010 – 08/2011

JOURNAL PUBLICATIONS

1. Sinead A. Williamson, Michael M. Zhang[†] and Paul Damien. A new class of time dependent latent factor models with applications. *Journal of Machine Learning Research*, 21(27):1–24, 2020.
2. Yang Ni, Peter Müller, Maurice Diesendruck[†], Sinead Williamson, Yitan Zhu, Yuan Ji. Scalable Bayesian nonparametric clustering and classification. *Journal of Graphical and Computational Statistics*, 29(1):53–65, 2020.
3. Michael M. Zhang[†] and Sinead A. Williamson. Embarrassingly parallel inference for Gaussian processes. *Journal of Machine Learning Research*, 20(169):1–26, 2019.

*Position taken while on leave of absence from the University of Texas at Austin.

[†]Student author at time of submission

4. Jaehyun Joo[†], Sinead A. Williamson, Ana I. Vazquez, Jose R. Fernandez and Molly S. Bray. The influence of 15-week exercise training on dietary patterns among young adults. *International Journal of Obesity*, 43(9):1681–1690, 2019.
5. Jaehyun Joo[†], Sinead A. Williamson, Ana I. Vazquez, Jose R. Fernandez and Molly S. Bray. Advanced dietary patterns analysis using sparse latent factor models in young adults. *Journal of Nutrition*, 148(12):1984–1992, 2018.
6. Markus Peters[†], Perry Groot, Wolfgang Ketter, Sinead A. Williamson, Maytal Saar-Tsechansky and Tom Heskes. A preference model for autonomous decision-making. *Machine Learning*, 107(6):1039–1069, 2018.
7. Finale Doshi-Velez and Sinead A. Williamson. Restricted Indian buffet processes. *Statistics and Computing*, 27(5):1205–1223, 2017.
8. Sinead A. Williamson. Nonparametric network models for link prediction. *Journal of Machine Learning Research*, 17(202):1–21, 2016.
9. Nick Foti and Sinead Williamson. A survey of non-exchangeable priors for Bayesian nonparametric models. *Pattern Analysis and Machine Intelligence*, 37(2):359–71, 2015.

REFEREED CONFERENCE PUBLICATIONS

1. Avinava Dubey[†], Michael M. Zhang, Eric P. Xing and Sinead A. Williamson. Distributed, partially collapsed MCMC for Bayesian nonparametrics. In *Proceedings of the 23rd Conference on Artificial Intelligence and Statistics*, pp. 3685–3695, 2020.
2. Jette Henderson, Shubham Sharma[†], Alan Gee[†], Valeri Alexiev, Steve Draper, Carlos Marin, Yessel Hinojosa, Christine Draper, Michael Perng, Luis Aguirre, Michael Li, Sara Rouhani, Shorya Consul[†], Susan Michalski, Akarsh Prasad, Mayank Chutani, Aditya Kumar, Shahzad Alam, Prajna Kandarpa, Binu Jesudasan, Colton Lee, Michael Criscolo, Sinead Williamson, Matt Sanchez and Joydeep Ghosh. Certifai: A Toolkit for Building Trust in AI Systems. In *International Joint Conference on Artificial Intelligence Demonstrations Track*, pp. 5249–5251, 2020.
3. Maurice Diesendruck[†], Guy W. Cole[†] and Sinead A. Williamson. Importance weighted generative networks. *European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases*, pp. 249–265. 2019.
4. Sinead A. Williamson and Mauricio Tec[†]. Random clique covers for graphs with local density and global sparsity. In *Proceedings of the 35th Conference on Uncertainty in Artificial Intelligence*, pp. 228–238, 2019.
5. Mohamed Baker Alawieh[†], Sinead A. Williamson and David Z. Pan. Rethinking sparsity in performance modeling for analog and mixed circuits using spike and slab models. In *Proceedings of the 56th ACM/IEEE Design Automation Conference*, 2019.
6. Avinava Dubey[†], Sashank J. Reddi[†], Barnabas Poczos, Alexander J. Smola, Eric P. Xing and Sinead A. Williamson. Variance reduction in stochastic gradient Langevin dynamics. In *Advances in Neural Information Processing Systems 29*, pp. 1154–1162, 2016.
7. Avinava Dubey[†], Qirong Ho[†], Sinead A. Williamson and Eric P. Xing. Dependent nonparametric trees for dynamic hierarchical clustering. In *Advances in Neural Information Processing Systems 27*, pp. 1152–1160, 2014.
8. Avinava Dubey[†], Sinead A. Williamson and Eric P. Xing. Parallel Markov chain Monte Carlo for Pitman-Yor mixture models. In *Proceedings of the 30th Conference on Uncertainty in Artificial Intelligence*, pp. 142–151, 2014.

9. Sinead A. Williamson, Steven N. MacEachern and Eric P. Xing. Restricting exchangeable nonparametric distributions. In *Advances in Neural Information Processing Systems 26*, pp. 2598–2606, 2013.
10. Avinava Dubey[†], Ahmed Hefny[†], Sinead Williamson and Eric P. Xing. A nonparametric mixture model for topic modeling over time. In *Proceedings of the SIAM International Conference on Data Mining*, pp. 530–538, 2013.
11. Nick Foti[†], Joseph Futoma[†], Daniel Rockmore and Sinead Williamson. A unifying representation for a class of dependent random measures. In *Proceedings of the 16th International Conference on Artificial Intelligence and Statistics*, pp. 20–28, 2013.
12. Sinead Williamson, Avinava Dubey[†] and Eric P. Xing. Parallel Markov chain Monte Carlo for nonparametric mixture models. In *Proceedings of the 30th International Conference on Machine Learning*, pp. 98–106, 2013.
13. Nick Foti[†] and Sinead Williamson. Slice sampling normalized kernel-weighted completely random measure mixture models. In *Advances in Neural Information Processing Systems 25*, pp. 2240–2248, 2012.
14. Yuening Hu[†], Ke Zhai[†], Sinead Williamson and Jordan Boyd-Graber. Modeling images using transformed Indian buffet processes. In *Proceedings of the 29th International Conference on Machine Learning*, pp. 1511–1518, 2012.
15. Sinead Williamson, Chong Wang[†], Katherine A. Heller and David M. Blei. The IBP compound Dirichlet process and its application to topic modeling. In *Proceedings of the 27th International Conference on Machine Learning*, pp. 1151–1158, 2010.
16. Sinead Williamson, Peter Orbanz and Zoubin Ghahramani. Dependent Indian buffet processes. In *Proceedings of the 13th International Conference on Artificial Intelligence and Statistics*, pp. 924–931, 2010.
17. Katherine A. Heller, Sinead Williamson and Zoubin Ghahramani. Statistical models for partial membership. In *Proceedings of the 25th International Conference on Machine Learning*, pp. 392–399, 2008.

BOOK CHAPTERS

1. Sinead Williamson, Chong Wang[†], Katherine A. Heller and David M. Blei. Nonparametric mixed membership models using the IBP compound Dirichlet process. K. L. Mengerson, C. P. Robert and D. M. Titterton, editors, *Mixture Estimation and Applications*. John Wiley & Sons, 2011.

WORKSHOP PAPERS (LIGHTLY REFEREED)

1. Shorya Consul[†] and Sinead A. Williamson. Differentially Private Median Forests for Regression and Classification. In *AAAI Privacy-Preserving Artificial Intelligence workshop*, 2021.
2. Elahe Ghalebi[†], Hamidreza Mahyar, Radu Grosu, Graham Taylor and Sinead Williamson. Sequential Edge Clustering in Temporal Multigraphs. In *NeurIPS workshop on Graph Representation Learning*, 2019.
3. Michael Zhang[†], Sinead Williamson and Fernando Perez-Cruz. Accelerated Inference for Latent Variable Models. In *NeurIPS workshop on All of Bayesian Nonparametrics*, 2018.
4. Michael Zhang[†] and Sinead Williamson. Embarrassingly parallel inference for Gaussian processes. In *NeurIPS Workshop on Advances in Approximate Bayesian Inference*, 2017.

5. Michael Zhang[†], Avinava Dubey[†] and Sinead Williamson. Parallel Markov chain Monte Carlo for the Indian buffet process. In *NeurIPS Workshop on Bayesian Nonparametrics: The Next Generation*, 2015.
6. Sinead Williamson, Chong Wang[†], Katherine A. Heller, and David M. Blei. Focused topic models. In *NeurIPS Workshop on Applications of Topic Models: Text and Beyond*, 2009.
7. Sinead Williamson and Zoubin Ghahramani. Probabilistic models for data combination in recommender systems. In *NeurIPS Workshop on Learning from Multiple Sources*, 2008.

PREPRINTS AND TECHNICAL REPORTS

TECHNICAL REPORTS IN RANK OF ASSISTANT PROFESSOR

1. Sinead A. Williamson and Jette Henderson. Understanding collections of related datasets using dependent MMD coresets. [arXiv:2006.14621](https://arxiv.org/abs/2006.14621), 2021.
2. Shorya Consul[†] and Sinead A. Williamson. Balance is key: Private median splits yield high-utility random trees. [arXiv:2006.08795](https://arxiv.org/abs/2006.08795), 2021.
3. Elahe Ghalebi, Hamidreza Mahyar, Radu Grosu, Graham W. Taylor and Sinead A. Williamson. A Nonparametric Bayesian Model for Sparse Dynamic Multigraphs. [arXiv:1905.11724](https://arxiv.org/abs/1905.11724), 2021.
4. Mónica Ribero[†], Jette Henderson, Sinead A. Williamson, and Haris Vikalo. Federating recommendations using differentially private prototypes. [arXiv:2003.00602](https://arxiv.org/abs/2003.00602), 2021.
5. Michael M. Zhang, Sinead A. Williamson, and Fernando Pérez-Cruz. Accelerated inference for latent variable models. [arXiv:1705.07178](https://arxiv.org/abs/1705.07178), 2020.
6. Michael M. Zhang, Bianca Dumitrascu[†], Sinead A. Williamson and Barbara E. Englehardt. Sequential Gaussian processes for online learning of nonstationary functions. [arXiv:1905.10003](https://arxiv.org/abs/1905.10003), 2019.
7. Guy W. Cole[†] and Sinead A. Williamson. Avoiding resentment via monotonic fairness. [arXiv:1909.01251](https://arxiv.org/abs/1909.01251), 2019.
8. Thom Lake, Sinead A. Williamson, Alexander T. Hawk, Christopher C. Johnson, and Benjamin P. Wing. Large-scale collaborative filtering with product embeddings. [arXiv:1901.04321](https://arxiv.org/abs/1901.04321), 2019.
9. Guy W. Cole[†] and Sinead A. Williamson. Stochastic blockmodels with edge information. [arXiv:1904.02016](https://arxiv.org/abs/1904.02016), 2019.
10. Peter Orbanz and Sinead Williamson. Unit-rate Poisson representations of completely random measures. <http://sinead.github.io/OrbanzWilliamson2016.pdf>, 2016.

SEMINARS AND CONFERENCE PRESENTATIONS

Statistical models for prediction and analysis in social interaction networks

Departmental showcase for the Dean of CNS, UT Austin[‡] 02/2021

Sequential edge clustering in temporal multigraphs

Joint Statistical Meetings, online[‡] 8/2021

University of Oxford, online[‡] 2/2021

Lancaster University, online[‡] 1/2021

UCL, cancelled due to COVID[‡] 05/2020

Finding and maintaining a supportive community as an ML researcher

ICML Newcomer's Workshop, online[‡] 6/2020

[‡]Invited talk

Distributed inference for Bayesian Nonparametrics	
International Conference on Bayesian Nonparametrics, Oxford, UK [‡]	06/2019
Nonparametric models for sparse structured graphs	
MIFODS Workshop on Graphical Models, Exchangeable Models and Graphons, MIT [‡]	08/2019
NetSci Satellite: Statistical Inference of Network Models, Burlington, VT [‡]	05/2019
NeurIPS workshop, All of Bayesian Nonparametrics, Montreal, Canada [‡]	12/2018
EcoSta, Hong Kong [‡]	06/2018
Purdue Symposium on Statistics, West Lafayette, IN [‡]	06/2018
Bayesian nonparametric models for networks	
Bayesian Nonparametric Inference: Dependence Structures and Applications, Oaxaca, Mexico [‡]	12/2017
ERCIM/CMStatistics, Seville, Spain [‡]	12/2016
University College London, UK	05/2015
Scalable inference for nonparametric latent feature models	
ISBA, Sardinia, Italy	07/2016
MCMSki/BayesComp, Lenzerheide, Switzerland [‡]	01/2016
Exact and efficient parallel inference for nonparametric mixture models	
IMA-HK-IAS Joint Program on Big Data, Hong Kong [‡]	01/2015
Universidad Carlos III, Madrid, Spain [‡]	11/2014
University of Colorado at Boulder, CO [‡]	10/2014
Joint Statistical Meetings, Montreal, Canada [‡]	08/2013
International Conference on Machine Learning, Atlanta, GA.	06/2013
Slice sampling dependent normalized random measures	
ICERM workshop on Bayesian Nonparametrics, Brown University, RI [‡]	09/2012
Flexible nonparametric models via restriction	
Bayesian Nonparametrics Workshop, Amsterdam, Netherlands	06/2013
ISBA, Kyoto, Japan	06/2012
ERCIM, London, UK	12/2011
Nonparametric Bayesian models for dependent data	
University of Maryland, College Park, MD [‡]	05/2011
Dependent completely random measures via Poisson line processes	
Bayesian Nonparametric Workshop, Veracruz, Mexico	07/2011
Yeditepe International Research Conference on Bayesian Learning, Istanbul, Turkey [‡]	06/2011
Department of Statistics, Columbia University, New York, NY [‡]	04/2011
Collegio Carlo Alberto, Moncalieri, Italy [‡]	03/2011
School of Informatics, Edinburgh University, Edinburgh, UK [‡]	01/2011
The IBP compound Dirichlet process	
International Conference on Machine Learning, Haifa, Israel.	06/2010
Department of Statistics, Columbia University, New York, NY [‡]	10/2009
Dependent Indian buffet processes	
Microsoft Research, Cambridge, UK [‡]	05/2010
Probabilistic models for data combination in recommender systems	
NeurIPS Workshop on Learning from Multiple Sources, Vancouver, Canada	10/2008

TEACHING

Department of Statistics and Data Science, UT Austin

SDS 328M Biostatistics Fall 2020, 2021, Spring 2021
SDS 383D Statistical Modeling II Spring 2018
SDS 321 Introduction to Probability and Statistics Spring 2015, 2016, 2017

McCombs School of Business

STA 371g Statistics and Modeling Spring 2014, 2015, 2016, 2018

Summer School Short Courses

Bayesian Nonparametrics (Machine Learning Summer School) 2016, 2018, 2020
Bayesian Modeling and Inference (Data Science Summer School) 2019

STUDENTS ADVISED

PhD students

Evan Ott, Statistics and Data Sciences, UT Austin

Omar Chavez, Statistics and Data Sciences, UT Austin (2021)

Current position: Data Scientist, Eventellect

Scalable and Causal Bayesian Inference

Elahe Ghalebi, Institute of Computer Engineering, TU Wien (2020)

(co-advised with Prof. Radu Grosu, TU Wien)

Modeling and Analysis of Time-evolving Sparse Networks

Current position: Postdoctoral researcher, Vector Institute

Guy Cole, Statistics and Data Sciences, UT Austin (2019)

Relational Learning and Fairness

Current position: Data Scientist, Facebook

Maurice Diesendruck, Statistics and Data Sciences, UT Austin (2019)

(co-advised with Prof. Mingyuan Zhou)

Distribution Distance Measures in Generative and Privacy Models

Current position: Data Scientist, Microsoft

Michael Zhang, Statistics and Data Sciences, UT Austin (2018)

Scalable inference for Bayesian nonparametrics

Current position: Assistant professor of Statistics at the University of Hong Kong

Masters and Certificate students

Mooyeon Kim, Civil, Architectural and Environmental Engineering, UT Austin. (Masters, 2016)

Segmentation of Highway Networks for Maintenance Operations

Kayla Schaefer, Statistics and Data Sciences, UT Austin (Masters, 2015)

Document clustering with nonparametric hierarchical topic modeling

Kuan-Yu Chen, Civil, Architectural and Environmental Engineering, UT Austin (Certificate, 2015)

*A More Efficient Way of Collecting Highway Condition Data by Implementing Gaussian Processes:
A Case Study on Interstate 45*

PhD committee member

Mónica Ribero, Electrical and Computer Engineering, UT Austin

Ali Lotfi, Electrical and Computer Engineering, UT Austin

Alek Dimitriev, Information, Risk and Operations Management, UT Austin

Mengjie Wang, Statistics and Data Sciences, UT Austin

Yanxin Li, Statistics and Data Sciences, UT Austin

Matteo Vestrucci, Statistics and Data Sciences, UT Austin (2021)

Carlos Pagani Zanini, Statistics and Data Sciences, UT Austin (2019)

Avinava Dubey, Machine Learning, Carnegie Mellon University (2019)
Mooyeon Kim, Civil, Architectural and Environmental Engineering, UT Austin (2019)
Jaehyun Joo, Nutritional Sciences, UT Austin (2018)
Valerio Perrone, Department of Statistics, University of Warwick (2018)
David Puelz, Information, Risk and Operations Management, UT Austin (2018)
Tianjian Zhou, Statistics and Data Sciences, UT Austin (2017)
Isabel Valera, Multimedia and Communications, Universidad Carlo III de Madrid (2014)

GRANTS

Previous funding (PI)

NSF IIS-1447721 “Collaborative Research: Theory and Algorithms for Parallel Probabilistic Inference with Big Data, via Big Model, in Realistic Distributed Computing Environments. Sep 2014 Aug 2018, \$300,000. Collaborative proposal (two separate but related grants); PI on related grant NSF ISS-1447676 was Eric P. Xing (Carnegie Mellon University).

Other External Gifts and Research Awards

Nvidia GPU grant: Titan X Pascal GPU (2017)

SERVICE

Department of Statistics and Data Science

SDS Faculty Search Committee

2015/16, 2020/21

Department of Information, Risk and Operations Management

STA 301 Course Development Committee

2019

Community

Organizing Committee, BNP Networking Event, Cyprus

2022

Organizing Committee, Neurips Workshop on Robustness and Misspecification in Probabilistic Modeling

2021

ISBA Savage Award Selection Committee

2021

j-ISBA Blackwell-Rosenbluth Award Selection Committee

2021

Diversity and Inclusion Chair, Artificial Intelligence and Statistics (AISTATS)

2021

Board of Directors, Women in Machine Learning (WiML)

2015–2017, 2020–2021

Newcomers Chair, International Conference on Machine Learning (ICML)

2020

Diversity and Inclusion Chair, WiML Workshop

2019

Senior Advisory Committee, Women in Machine Learning (WiML)

2017–2019

Organizing Committee, NeurIPS Workshop on All of Bayesian Nonparametrics

2018

Committee Member, ISBA Continuing Education Committee

2015–2017

Organizing Committee, NeurIPS Workshop on Practical Bayesian Nonparametrics

2016

Organizing Committee, NeurIPS Workshop on Bayesian Nonparametrics

2015

REVIEWING

Journals

Associate Editor: Journal of Computational and Graphical Statistics (2020–present).

Reviewer: Bayesian Analysis, Electronic Journal of Statistics, IEEE Signal Processing Magazine, IEEE Transactions on Pattern Analysis and Machine Learning, Journal of Machine Learning Research, Journal of Mathematical Psychology, Journal of the American Statistical Association, Machine Learning, Statistics and Computing, Computational and Graphical Statistics.

Conferences

Area chair/SPC: International Conference on Learning Representations (2021), International Conference on Machine Learning (2014, 2015, 2017, 2018, 2019); Neural Information Processing Systems (2015, 2017, 2019, 2020); Artificial Intelligence and Statistics (2016, 2017, 2018, 2019, 2021).

Reviewer/PC: Artificial Intelligence and Statistics, Conference on Artificial Intelligence, International Conference on Machine Learning, International Joint Conferences on Artificial Intelligence, Neural Information Processing Systems, Uncertainty in Artificial Intelligence.

Other

NSF Panel Member, various SBIR/STTR programs (2016, 2017).