

Sinead A. Williamson

McCombs School of Business
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EDUCATION

University of Cambridge 2006 - 2012
Ph.D. in Engineering (Machine Learning).
Thesis: *Nonparametric Bayesian models for dependent data.*
Advisor: Zoubin Ghahramani.

University College London 2005 - 2006
M.Sc. in Physics (Distinction).
Thesis: *Light injection calibration for NEMO 3.*

University of Oxford 2001 - 2005
M.Eng in Engineering Science (First Class Honours).
Thesis: *Lexicographic text analysis using non-negative factorisation techniques.*

ACADEMIC POSITIONS

University of Texas at Austin 08/2013 – Present
Assistant Professor of Statistics, Department of Information, Risk and Operations
Management/Department of Statistics and Data Science.

Carnegie Mellon University 09/2011 – 08/2013
Postdoctoral researcher, Machine Learning Department.
Advisor: Eric Xing.

University of Maryland 92/2011 – 08/2011
Visiting scholar, Department of Computer Science.
Host: Hal Daumé III.

University of Cambridge 12/2010 – 08/2011
EPSRC PhD Plus research associate, Department of Engineering.
Advisor: Zoubin Ghahramani.

JOURNAL PUBLICATIONS

Markus Peters, Perry Groot, Wolfgang Ketter, Sinead A. Williamson, Maytal Saar-Tsechansky and Tom Heskes. A preference model for autonomous decision-making. Accepted for publication, Machine Learning Journal.

Finale Doshi-Velez and Sinead A. Williamson. Restricted Indian buffet processes. Statistics and Computing, 27(5):12051223, 2017.

Sinead A. Williamson. Nonparametric network models for link prediction. Journal of Machine Learning Research, 17(202):1-21, 2016.

Nick Foti and Sinead Williamson. A survey of non-exchangeable priors for Bayesian nonparametric models. *Pattern Analysis and Machine Intelligence*, 37(2):35971, 2015.

CONFERENCE PUBLICATIONS (PEER REVIEWED)

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.

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.

Avinava Dubey, Sinead A. Williamson and Eric P. Xing. Parallel Markov chain Monte Carlo for Pitman-Yor mixture models. In *Proceedings of the Thirtieth Conference on Uncertainty in Artificial Intelligence*, pp. 142–151, 2014.

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.

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.

Nick Foti, Joseph Futoma, Daniel Rockmore and Sinead Williamson. A unifying representation for a class of dependent random measures. In *Proceedings of the Sixteenth International Conference on Artificial Intelligence and Statistics*, pp. 20–28, 2013.

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.

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.

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.

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.

Sinead Williamson, Peter Orbanz and Zoubin Ghahramani. Dependent Indian buffet processes. In *Proceedings of the Thirteenth International Conference on Artificial Intelligence and Statistics*, pp. 924–931, 2010.

Katherine A. Heller, Sinead Williamson and Zoubin Ghahramani. Statistical models for partial membership. In *Proceedings of the 25th International Confer-*

ence on Machine Learning, pp. 392–399, 2008.

BOOK CHAPTERS

Sinead Williamson, Chong Wang, Katherine A. Heller and David M. Blei. Non-parametric mixed membership models using the IBP compound Dirichlet process. K. L. Mengerson, C. P. Robert and D. M. Titterington, editors, *Mixture Estimation and Applications*. John Wiley & Sons, 2011.

WORKSHOP PAPERS (LIGHTLY REVIEWED)

Michael Zhang and Sinead Williamson. Embarrassingly parallel inference for Gaussian processes. In *NIPS Workshop on Advances in Approximate Bayesian Inference*, 2017.

Michael Zhang, Avinava Dubey and Sinead Williamson. Parallel Markov chain Monte Carlo for the Indian buffet process. In *NIPS Workshop on Bayesian Non-parametrics: The Next Generation*, 2015.

Sinead Williamson, Chong Wang, Katherine A. Heller, and David M. Blei. Focused topic models. In *NIPS Workshop on Applications of Topic Models: Text and Beyond*, 2009.

Sinead Williamson and Zoubin Ghahramani. Probabilistic models for data combination in recommender systems. *NIPS Workshop on Learning from Multiple Sources*, 2008.

WORKING AND SUBMITTED PAPERS

Michael M. Zhang and Sinead A. Williamson. Embarrassingly parallel inference for Gaussian processes. Under review.

Maurice Diesendruck, Guy Cole and Sinead A. Williamson. Importance sampling in generative networks. Under review.

Guy Cole and Sinead A. Williamson. Stochastic blockmodels with edge information. Under review.

Jaehyun Joo, Sinead A. Williamson, Ana I. Vasquez, Jose R. Fernandez and Molly S. Bray. Exploring dietary patterns among young adults using sparse latent factor models. Under review.

Sinead Williamson, Michael M. Zhang and Paul Damien. A new class of time dependent latent factor models with applications. Manuscript available at <http://sinead.github.io/WilliamsonZhangDamien2016.pdf>

Peter Orbanz and Sinead Williamson. Unit-rate Poisson representations of completely random measures. <http://sinead.github.io/OrbanzWilliamson2016.pdf>

CONFERENCE AND INVITED TALKS

Bayesian nonparametric models for networks.	
Bayesian Nonparametric Inference: Dependence Structures and their Applications, Oaxaca, Mexico.	12/2017
ERCIM/CMStatistics, Seville, Spain.	12/2016
University College London, UK.	05/2015
Restricted Indian buffet processes.	
Bayesian Nonparametrics Workshop, Paris, France.	06/2017
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, CA.	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.

NIPS Workshop on Learning from Multiple Sources, Vancouver, CA. 10/2008

TEACHING

SDS 383D Statistical Modeling II, Department of Statistics and Data Science, UT Austin, Spring 2018.

SDS 321 Introduction to Probability and Statistics, Department of Statistics and Data Science, UT Austin, Spring 2015, 2016, 2017.

STA 371g Statistics and Modeling, McCombs School of Business, UT Austin, Spring 2014, 2015, 2016, 2018.

Bayesian Nonparametrics (Short course), Machine Learning Summer School, Arequipa, Peru, Summer 2016.

GRANTS

IIS-1447721 (Co-PI, with Eric Xing): “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.

Nvidia GPU Grant, 2017.

STUDENTS ADVISED

PhD students

Michael Zhang, Statistics and Data Sciences.
Scalable inference for Bayesian nonparametrics.

Omar Chavez, Statistics and Data Sciences.
Inference methods for Big Data.

Guy Cole, Statistics and Data Sciences.
Bayesian models for networks and text.

Maurice Diesendruck, Statistics and Data Sciences (co-advised with Prof. Mingyuan Zhou). *Generative Adversarial Models.*

Evan Ott, Statistics and Data Sciences. *Bayesian deep learning.*

Masters and Certificate students

Kayla Schaefer, Statistics and Data Sciences (Masters, 2015).
Document clustering with nonparametric hierarchical topic modeling.

Kuan-Yu Chen, Civil, Architectural and Environmental Engineering (Certificate, 2015). *A More Efficient Way of Collecting Highway Condition Data by Implementing Gaussian Processes: A Case Study on Interstate 45.*

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

Segmentation of Highway Networks for Maintenance Operations.

PhD committee member

Avinava Dubey, Machine Learning, Carnegie Mellon University.
Isabel Valera, Multimedia and Communications, Universidad Carlo III de Madrid (Graduated 2014).
Tianjian Zhou, Statistics and Data Sciences, UT Austin (Graduated 2017).
Jaehyun Joo, Nutritional Sciences, UT Austin.
Mooyeon Kim, Civil, Architectural and Environmental Engineering, UT Austin.
Mengjie Wang, Statistics and Data Sciences, UT Austin.
Matteo Vestrucci, Statistics and Data Sciences, UT Austin.
Carlos Pagani Zanini, Statistics and Data Sciences, UT Austin.

REVIEWING

Journals

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 Machine Learning, 2014, 2015, 2017, 2018; Neural Information Processing Systems, 2015, 2017; Artificial Intelligence and Statistics, 2016, 2017.

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.

ORGANIZATION AND SERVICE

Organizer, NIPS Workshop on Bayesian Nonparametrics.	2015
Organizer, NIPS Workshop on Practical Bayesian Nonparametrics.	2016
Chair, ISBA Continuing Education Committee.	2016 – 2017
Committee Member, ISBA Continuing Education Committee.	2015 –
Board of Directors, Women in Machine Learning (WiML).	2014 –

MEDIA

Profiled on Women in Machine Learning’s Facebook and Twitter pages. 08/2016
Interviewed on “Talking Machines”, a popular Machine Learning podcast. 06/2016