

IROM

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EDUCATION

- PhD, Machine Learning.** 10/2006 – 03/2012
Department of Engineering, University of Cambridge.
Thesis: *Nonparametric Bayesian models for dependent data.*
Advisor: Zoubin Ghahramani.
- MSc Physics (Distinction).** 09/2005 – 09/2006
University College London.
Thesis: *Light injection calibration for NEMO 3.*
- MEng Engineering Science (First Class Honours).** 10/2001 – 06/2005
St Catherine's College, University of Oxford.
Thesis: *Lexicographic text analysis using non-negative factorisation techniques.*

ACADEMIC POSITIONS

- Assistant professor.** 08/2013 –
Department of Information, Risk & Operations Management / Department of Statistics and Data Science, University of Texas at Austin.
- Postdoctoral researcher.** 09/2011 – 08/2013
Machine Learning Department, Carnegie Mellon University.
- Visiting scholar.** 02/2011 – 08/2011
Department of Computer Science, University of Maryland.
- EPSRC PhD Plus research associate.** 12/2010 – 08/2011
Department of Engineering, University of Cambridge.
- Research assistant (part-time).** 09/2005 – 09/2006
Department of Physics, University College London.

INDUSTRIAL POSITIONS

- Software Engineering Intern.** 07/2008 – 11/2008
Search Quality group, Google, Zurich, Switzerland.

JOURNAL PUBLICATIONS

Sinead A. Williamson. Nonparametric Network Models for Link Prediction. *Journal of Machine Learning Research*, 17(202):1-21, 2016.

Finale Doshi-Velez and Sinead A. Williamson. Restricted Indian buffet processes. To appear in *Statistics and Computing*, 2016. doi:10.1007/s11222-016-9681-y

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.

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. *Advances in Neural Information Processing Systems 29*, pp. 1154–1162, 2016. Acceptance rate: 22.7%.

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. Acceptance rate: 24.7%.

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. Acceptance rate: 28.1%.

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. Acceptance rate: 25.3%.

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. Acceptance rate: 25.5%.

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. Acceptance rate: 33.6%. Notable paper award.

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. Acceptance rate: 23.5%.

Nick Foti and Sinead Williamson. Slice sampling normalized kernel-weighted completely random measure mixture models. In *Advances in Neural Information Pro-*

cessing Systems 25, pp. 2240–2248, 2012. Acceptance rate: 25.2%.

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. Acceptance rate: 27.3%.

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. Acceptance rate: 27.2%.

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. Acceptance rate: 40.6%.

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. Acceptance rate: 27.1%.

WORKSHOP PAPERS (LIGHTLY REVIEWED)

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.

BOOK CHAPTERS

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. Titterington, editors, *Mixture Estimation and Applications*. John Wiley & Sons, 2011.

WORKING PAPERS

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

Peter Orbanz and Sinead Williamson. Unit-rate Poisson representations of com-

pletely random measures. <http://sinead.github.io/OrbanzWilliamson2016.pdf>

Michael M. Zhang, Avinava Dubey and Sinead Williamson. Distributed inference in Bayesian nonparametric models using partially collapsed MCMC.

CONFERENCE AND INVITED TALKS

Scalable inference for nonparametric latent feature models

ISBA, Sardinia, Italy. **07/2016**

MCMSki/BayesComp, Lenzerheide, Switzerland. **01/2016**

Bayesian nonparametric models for prediction in networks

ERCIM/CMStatistics, Seville, Spain. **12/2016**

University College London, UK. **05/2015**

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**

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**

Nonparametric Bayesian models for dependent data.

University of Maryland, College Park, MD. **05/2011**

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, Canada. 10/2008

TEACHING

SDS 321 Introduction to Probability and Statistics. Spring 2015, 2016, 2017

Department of Statistics and Data Science, UT Austin.

STA 371g Statistics and Modeling.

Spring 2014, 2015, 2016

McCombs School of Business, UT Austin.

Bayesian Nonparametrics (Short course).

Summer 2016

Machine Learning Summer School, Arequipa, Peru.

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.

STUDENTS ADVISED

Graduate students

Michael Zhang, Department of Statistics and Data Sciences.

Scalable inference for Bayesian nonparametrics

Omar Chavez, Department of Statistics and Data Sciences.

Inference methods for Big Data

Guy Cole, Department of Statistics and Data Sciences.

Bayesian models for networks and text

Maurice Diesendruck, Department of Statistics and Data Sciences (co-advised with Prof. Mingyuan Zhou).

Generative Adversarial Models

Masters and Certificate students

Kayla Schaefer, Department of Statistics and Data Sciences (Masters, 2015).

Document clustering with nonparametric hierarchical topic modeling

Kuan-Yu Chen, Department of 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, Department of Civil, Architectural and Environmental Engineering. (Masters, 2016)

Segmentation of Highway Networks for Maintenance Operations

PhD committee member

Avinava Dubey, Department of Machine Learning, Carnegie Mellon University.

Isabel Valera, Department of Multimedia and Communications, Universidad Carlo III de Madrid. (Graduated 2014)

Tianjian Zhou, Department of Statistics and Data Sciences, UT Austin.

Jaehyun Joo, Department of Nutritional Sciences, UT Austin.

Mooyeon Kim, Department of Civil, Architectural and Environmental Engineering, 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.

Conferences

Area chair/SPC: International Conference on Machine Learning, 2014, 2015; Neural Information Processing Systems, 2015, 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, Phase I: Big Data; Advanced Data Analytics III SBIR/STTR.

ORGANIZATION AND SERVICE

Organizer , NIPS Workshop on Bayesian Nonparametrics: The Next Generation	2015
Organizer , NIPS Workshop on Practical Bayesian Nonparametrics	2016
Chair , ISBA Continuing Education Committee	2016 –
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	August 2016
Interviewed on “Talking Machines”, a popular Machine Learning podcast	June 2016