John Paisley

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Employment

Columbia University, New York, NY — 7/2013 – present
Assistant Professor, Department of Electrical Engineering

University of California, Berkeley, Berkeley, CA — 7/2011 – 7/2013
Postdoctoral Fellow, EECS Computer Science Division

Princeton University, Princeton, NJ — 1/2010 – 7/2011
Postdoctoral Fellow, Department of Computer Science

Education

Duke University, Durham, NC

Ph.D. Electrical and Computer Engineering, May 2010

M.S. Electrical and Computer Engineering, May 2007

B.S.E. Electrical and Computer Engineering, Computer Science; Minor: Classical Studies, May 2004

Awards and Recognitions

Distinguished Faculty Teaching Award, Columbia Engineering Alumni Association, 2017

Top 10% Paper Recognition, IEEE International Conference on Image Processing, 2013

Notable Paper Award, International Conference on Artificial Intelligence and Statistics, 2011

Confucius Institute Language Scholarship, Xiamen University (host), 12/2011 – 1/2012

Charles R. Vail Outstanding Graduate Scholarship Award, Duke University, May 2010

David Randall Fuller Prize, Duke University, May 2004

Publications

Refereed Journal Papers

1. X. Fu, J. Huang, X. Ding, Y. Liao and J. Paisley (2017). Clearing the skies: A deep network architecture for single-image rain removal, *IEEE Transactions on Image Processing* (to appear).
2. V. Chen, J. Paisley and X. Lu (2017). Revealing common disease mechanisms shared by tumors of different tissues of origin through semantic representation of genomic alterations and topic modeling, *BMC Genomics*, 8(Suppl 2):105.
3. X. Fu, D. Zeng, Y. Huang, Y. Liao, X. Ding and J. Paisley (2016). A fusion-based enhancing method for weakly illuminated images, *Signal Processing*, vol. 129, pp. 82-96.
4. J. Paisley, C. Wang, D. Blei and M.I. Jordan (2015). Nested hierarchical Dirichlet processes, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 37, no. 2, pp. 256-270.
5. T. Broderick, L. Mackey, J. Paisley and M.I. Jordan (2015). Combinatorial clustering and the beta negative binomial process, *IEEE Trans. on Pattern Analysis and Machine Intelligence*, vol. 37, no. 2, pp. 290-306.

6. Y. Huang, J. Paisley, Q. Lin, X. Ding, X. Fu and X. Zhang (2014). Bayesian nonparametric dictionary learning for compressed sensing MRI, *IEEE Trans. on Image Processing*, vol. 23, no. 12, pp. 5007-5019.
7. M. Hoffman, D. Blei, C. Wang and J. Paisley (2013). Stochastic variational inference, *Journal of Machine Learning Research*, vol. 14, pp. 1303-1347.
8. J. Paisley, C. Wang and D. Blei (2012). The discrete infinite logistic normal distribution, *Bayesian Analysis*, vol. 7, no. 2, pp. 235-272.
9. M. Zhou, H. Chen, J. Paisley, L. Ren, L. Li, Z. Xing, D. Dunson, G. Sapiro and L. Carin (2012). Nonparametric Bayesian dictionary learning for analysis of noisy and incomplete images, *IEEE Transactions on Image Processing*, vol. 21, no. 1, pp. 130-144.
10. J. Paisley, X. Liao and L. Carin (2010). Active learning and basis selection for kernel-based linear models: a Bayesian perspective, *IEEE Transactions on Signal Processing*, vol. 58, no. 5, pp. 2686-2700.
11. I. Pruteanu-Malinici, L. Ren, J. Paisley, E. Wang and L. Carin (2010). Hierarchical Bayesian modeling of topics in time-stamped documents, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 32, no. 6, pp. 996-1011.
12. M. Chen, J. Silva, J. Paisley, C. Wang, D. Dunson and L. Carin (2010). Compressive sensing on manifolds using a nonparametric mixture of factor analyzers: algorithm and performance bounds, *IEEE Transactions on Signal Processing*, vol. 58, no. 12, pp. 6140-6155.
13. B. Chen, M. Chen, J. Paisley, A. Zaas, C. Woods, G.S. Ginsburg, A. Hero III, J. Lucas, D. Dunson and L. Carin (2010). Bayesian inference of the number of factors in gene-expression analysis: Application to human virus challenge studies, *BMC Bioinformatics*, 11:552.
14. J. Paisley and L. Carin (2009). Hidden Markov models with stick breaking priors, *IEEE Transactions on Signal Processing*, vol. 57, no. 10, pp. 3905-3917.
15. K. Ni, J. Paisley, L. Carin and D. Dunson (2008). Multi-task learning for analyzing and sorting large databases of sequential data, *IEEE Transactions on Signal Processing*, vol. 56, no. 8-2, pp. 3918-3931.
16. Y. Qi, J.W. Paisley, L. Carin (2007). Music analysis using hidden Markov mixture models, *IEEE Transactions on Signal Processing*, vol. 55, no. 11, pp. 5209-5224.

Peer-Reviewed Conference Papers

17. X. Fu, J. Huang, D. Zeng, Y. Huang, X. Ding and J. Paisley (2017). Removing rain from single images via a deep detail network, *IEEE Conference on Computer Vision and Pattern Recognition*, Honolulu, HI, USA.
18. A.B. Dieng, C. Wang, J. Gao and J. Paisley (2017). TopicRNN: A recurrent neural network with long-range semantic dependency, *International Conference on Learning Representations*, Toulon, France.
19. A. Zhang and J. Paisley (2016). Markov latent feature models, *International Conference on Machine Learning*, New York, NY, USA.
20. A. Zhang, S. Gultekin and J. Paisley (2016). Stochastic variational inference for the HDP-HMM, *International Conference on Artificial Intelligence and Statistics*, Cadiz, Spain.
21. Y. Jiang, X. Ding, D. Zeng, Y. Huang and J. Paisley (2015). Pan-sharpening with a hyper-Laplacian penalty, *International Conference on Computer Vision*, Santiago, Chile.
22. A. Schein, J. Paisley, D. Blei and H. Wallach (2015). Bayesian Poisson tensor factorization for inferring multilateral relations from sparse dyadic event counts, *International Conference on Knowledge Discovery and Data Mining*, Sydney, Australia.
23. A. Zhang and J. Paisley (2015). Markov mixed membership models, *International Conference on Machine Learning*, Lille, France.
24. D. Liang and J. Paisley (2015). Landmarking manifolds with Gaussian processes, *International Conference on Machine Learning*, Lille, France.
25. S. Sertoglu and J. Paisley (2015). Scalable Bayesian nonparametric dictionary learning, *European Signal Processing Conference*, Nice, France. (invited paper)

26. S. Gultekin and J. Paisley (2014). A collaborative Kalman filter for time-evolving dyadic processes, *IEEE International Conference on Data Mining*, Shenzhen, China.

27. D. Liang, J. Paisley and D. Ellis (2014). Codebook-based scalable music tagging with Poisson matrix factorization, *International Society for Music Information Retrieval Conference*, Taipei, Taiwan.

28. X. Ding, Y. Jiang, Y. Huang and J. Paisley (2014). Pan-sharpening with a Bayesian nonparametric dictionary learning model, *International Conference on Artificial Intelligence and Statistics*, Reykjavik, Iceland.

29. X. Ding, J. Paisley, Y. Huang, X. Chen, F. Huang and X. Zhang (2013). Compressed sensing MRI with Bayesian dictionary learning, *IEEE International Conference on Image Processing*, Melbourne, Australia. (**Top 10% Paper Recognition**)

30. J. Xie, Y. Huang, J. Paisley, X. Ding and X. Zhang (2013). Pan-sharpening based on nonparametric Bayesian adaptive dictionary learning, *IEEE International Conf. on Image Processing*, Melbourne, Australia.

31. J. Paisley, D. Blei and M.I. Jordan (2012). Variational Bayesian inference with stochastic search, *International Conference on Machine Learning*, Edinburgh, Scotland.

32. J. Paisley, D. Blei and M.I. Jordan (2012). Stick-breaking beta processes and the Poisson process, *International Conference on Artificial Intelligence and Statistics*, La Palma, Canary Islands.

33. J. Paisley, L. Carin and D. Blei (2011). Variational inference for stick-breaking beta process priors, *International Conference on Machine Learning*, Bellevue, WA, USA.

34. J. Paisley, C. Wang and D. Blei (2011). The discrete infinite logistic normal distribution for mixed-membership modeling, *International Conference on Artificial Intelligence and Statistics*, Fort Lauderdale, FL, USA. (**Notable Paper Award**)

35. C. Wang, J. Paisley and D. Blei (2011). Online variational inference for the hierarchical Dirichlet process, *International Conference on Artificial Intelligence and Statistics*, Fort Lauderdale, FL, USA.

36. M. Zhou, C. Wang, M. Chen, J. Paisley, D. Dunson and L. Carin (2011). Nonparametric Bayesian matrix completion, *International Conference on Sampling Theory and Applications*, Singapore.

37. J. Paisley, M. Zhou, G. Sapiro and L. Carin (2010). Nonparametric image interpolation and dictionary learning using spatially-dependent Dirichlet and beta process priors, *IEEE International Conference on Image Processing*, Hong Kong, China.

38. J. Paisley, A. Zaas, C.W. Woods, G.S. Ginsburg and L. Carin (2010). A stick-breaking construction of the beta process, *International Conference on Machine Learning*, Haifa, Israel.

39. J. Paisley and L. Carin (2010). A nonparametric Bayesian model for kernel matrix completion, *IEEE International Conference on Acoustics, Speech and Signal Processing*, Dallas, TX.

40. B. Chen, J. Paisley, L. Carin (2010). Sparse linear regression with beta process priors, *IEEE International Conference on Acoustics, Speech and Signal Processing*, Dallas, TX.

41. M. Zhou, H. Chen, J. Paisley, L. Ren, G. Sapiro and L. Carin (2009). Non-parametric Bayesian dictionary learning for sparse image representations, *Advances in Neural Information Processing Systems*, Vancouver, Canada.

42. J. Paisley and L. Carin (2009). Nonparametric factor analysis with beta process priors, *International Conference on Machine Learning*, Montreal, Canada.

43. J. Paisley and L. Carin (2009). Dirichlet process mixture models with multiple modalities, *IEEE International Conference on Acoustics, Speech and Signal Processing*, Taipei, Taiwan.

44. Y. Qi, J. Paisley, L. Carin (2007). Dirichlet process HMM mixture models with application to music analysis, *IEEE International Conference on Acoustics, Speech and Signal Processing*, Honolulu, HI.

Book Chapters

45. J. Paisley, D. Blei and M. Jordan (2014). Bayesian nonnegative matrix factorization with stochastic variational inference, In E.M. Airoldi, D. Blei, E.A. Erosheva & S.E. Fienberg (Eds.), *Handbook of Mixed Membership Models and Their Applications.* Chapman & Hall/CRC Handbooks of Modern Statistical Methods.

Thesis

46. J. Paisley (2010). *Machine Learning with Dirichlet and Beta Process Priors: Theory and Applications.* Ph.D. dissertation, Duke University.
47. J. Paisley (2007). *Machine Learning Applications in Music Recommendation.* M.S. thesis, Duke University.

Selected Workshop Papers and Posters

48. J. Paisley, C. Wang, D. Blei, M.I. Jordan (2013). A nested HDP for hierarchical topic models, *International Conference on Learning Representations* (workshop track), Scottsdale, AZ.
49. J. Paisley, L. Carin and D. Blei (2011). Constructing beta processes and approximate posterior inference with variational Bayes, *ISBA Workshop on Bayesian Nonparametrics*, Veracruz, Mexico.
50. M. Zhou, C. Wang, M. Chen, J. Paisley, D. Dunson and L. Carin (2010). Nonparametric Bayesian maxtrix completion, *IEEE Sensor Array and Multichannel Signal Processing Workshop*, Israel.
51. M. Zhou, J. Paisley and L. Carin (2009). Nonparametric learning of dictionaries for sparse representation of sensor signals, *IEEE Workshop on Computational Advances in Multi-Sensor Adaptive Processing*, Aruba.

Professional Activities

Conference and Workshop Organization

Senior Program Committee, International Conference on Machine Learning, 2015

Senior Program Committee, Artificial Intelligence and Statistics, 2014, 2015, 2017

Senior Program Committee, International Joint Conference on Artificial Intelligence, 2015, 2016, 2017

Organization (Special Sessions), IEEE Int. Conf. on Visual Communications and Image Processing, 2018

Organization (Special Sessions), IEEE International Workshop on Multimedia Signal Processing, 2015

Organization (Volunteers), International Conference on Machine Learning, 2014

Topic contributed session (organizer and chair), Joint Statistical Meetings, 2013
Session title: "Recent developments in Bayesian nonparametric methods"

Journal Reviewing († indicates "very frequent")

Annals of Applied Statistics (IMS)

Bayesian Analysis (ISBA)

Bernoulli Journal (IMS)

Elsevier – Computational Statistics and Data Analysis

Elsevier – Communications in Statistics: Simulation and Computation

Elsevier – Journal on Signal Processing: Image Communication

Elsevier – Magnetic Resonance Imaging

Elsevier – Neurocomputing

Elsevier – Pattern Recognition Letters

Foundations and Trends in Machine Learning

IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing

IEEE Journal of Selected Topics in Signal Processing

IEEE Signal Processing Letters

IEEE Transactions on Computational Social Systems

IEEE Transactions on Cybernetics

†IEEE Transactions on Image Processing
IEEE Transactions on Knowledge and Data Engineering
IEEE Transactions on Multimedia
IEEE Transactions on Neural Networks and Learning Systems
†IEEE Transactions on Pattern Analysis and Machine Intelligence
†IEEE Transactions on Signal Processing
Journal of the American Statistical Association (ASA)
Journal of Computational and Graphical Statistics (ASA)
†Journal of Machine Learning Research
PLOS ONE
Springer – Data Mining and Knowledge Discovery
Springer – Machine Learning Journal
Springer – Statistics and Computing

Conference Reviewing

Annual Meeting of the Association for Computational Linguistics (ACL) 2015, 2016
AAAI Conference on Artificial Intelligence (AAAI) 2012
Artificial Intelligence and Statistics (AISTATS) 2012, 2013, 2016
Empirical Methods in Natural Language Processing (EMNLP) 2011, 2013, 2014
European Signal Processing Conference (EUSIPCO) 2014, 2015
IEEE Conference on Decision and Control (CDC) 2016
International Conference on Machine Learning (ICML) 2010, 2012, 2013, 2014, 2016, 2017
Neural Information Processing Systems (NIPS) 2010, 2011, 2012, 2013, 2015, 2016, 2017
Uncertainty in Artificial Intelligence (UAI) 2011, 2012, 2013, 2014, 2015, 2016, 2017

Book Reviewing

Springer Interdisciplinary Applied Mathematics Series
Chapman & Hall/CRC Handbooks of Modern Statistical Methods

Columbia University

Data Science Institute, core faculty
Data Science Institute, education committee, 2015–2017
Research Initiatives in Science & Engineering (RISE) grant review panel, 2015, 2017
Research Opportunities and Approaches to Data Science (ROADS) grant review panel, 2016
ENG: Engineering the Next Generation, High School Summer Research Program (mentor), 2016

Teaching at Columbia University

ColumbiaX (edX): Machine Learning, Spring 2017–present

EECS E6720: Bayesian Models for Machine Learning, Fall 2016, Fall 2017

ELEN E4903: Topic: Machine Learning, Spring 2016

EECS E6892: Topic: Bayesian Models for Machine Learning, Spring 2014, Fall 2015

COMS W4721: Machine Learning for Data Science, Spring 2015, Spring 2017

ELEN E9801: Topic: Advanced Probabilistic Machine Learning, Fall 2014

Ph.D. Supervision

San Gultekin (2013 – present)

Aonan Zhang (2014 – present)

Ghazal Fazelnia (2015 – present)

Adji Bousso Dieng (2016 – present)

Ph.D. Committees

Junfeng He (Columbia University, Electrical Engineering, 2013)

Changyou Chen (Australian National University, Computer Science, 2014)

Yasin Yilmaz (Columbia University, Electrical Engineering, 2014)

Felix Yu (Columbia University, Electrical Engineering, 2015)

Guangnan Ye (Columbia University, Electrical Engineering, 2015)

Xiao-Ming Wu (Columbia University, Electrical Engineering, 2016)

Xiannian Fan (City University of New York, Computer Science, 2016)

Brendan Jou (Columbia University, Electrical Engineering, 2016)

Dawen Liang (Columbia University, Electrical Engineering, 2016)

Vicky Chen (University of Pittsburgh, Biomedical Informatics, 2016)

Shang Li (Columbia University, Electrical Engineering, 2017)

Yuanjun Gao (Columbia University, Statistics, 2017)

Invited Talks

2017 Duke-Tsinghua Machine Learning Summer School, Kunshan, China
New Jersey Institute of Technology, Data Mining & Analysis for Managers, guest lecture
Columbia University, Data Science Institute Colloquium
Carnegie Mellon University, Machine Learning Lunch Seminar
University of Pittsburgh, Biomedical Informatics Colloquium

2016 Becton Dickinson Company, Franklin Lakes, NJ, Statistics and Data Analytics Meeting
University of Texas at Austin, Statistics and Data Sciences Seminar
Xiamen University, Information Science Seminar
Duke-Tsinghua Machine Learning Summer School, Kunshan, China

2015 University of Washington, Statistics Seminar
University of Toronto, Machine Learning Tea Talk
Ryerson University, Electrical and Computer Engineering Seminar
Columbia University, Statistics Student Seminar

European Signal Processing Conference, Nice, France
Workshop on Sensing and Analysis of High-Dimensional Data, Duke University
Workshop on Information Theory and Applications, University of California at San Diego

2014 Hong Kong University of Science and Technology, Business School Seminar
Columbia University, Statistics Student Seminar
Xiamen University, Information Science Seminar

2013 Workshop on Graphical Models, Columbia University
City University of New York, Computer Science Colloquium
Joint Statistical Meetings, Montreal, Canada
Tsinghua University, Institute for Interdisciplinary Information Sciences (IIIS) Colloquium
Columbia University, Electrical Engineering Colloquium
Princeton University, Computer Science Colloquium
ISBA Conference on Bayesian Nonparametrics, Amsterdam, Netherlands
University of Virginia, Computer Science Colloquium
Xiamen University, Information Science Seminar
Xidian University, Electronic Engineering Seminar

Pre-2013 Hunan University of Science and Technology, 2012
INRIA, École Normale Supérieure, SIERRA Seminar, 2012
Northeastern University, Electrical and Computer Engineering Seminar, 2012
University College London, Gatsby Unit Seminar, 2012
Xiamen University, Information Science Seminar, 2011, 2012
University of California Berkeley, Neyman Seminar, 2011
NSWC Panama City Division, 2009
Princeton University, Computer Science Seminar, 2009

Additional Information

Professional memberships: IEEE, ACM, ISBA, EURASIP
Languages: Mandarin Chinese (HSK Level 5/6), English
Citizenship: USA