

John Paisley

Columbia University
Department of Electrical Engineering
500 West 120th Street, Suite 1300
New York, NY 10027

Phone: (212) 854-8024
Office: Seeley Mudd 422
Email: jpaisley@columbia.edu
Web: columbia.edu/~jwp2128

Employment

Columbia University, New York, NY

Associate Professor, Department of Electrical Engineering 7/2018 – present
Assistant Professor, Department of Electrical Engineering 7/2013 – 7/2018

University of California, Berkeley, Berkeley, CA

Postdoctoral Fellow, EECS Computer Science Division 7/2011 – 7/2013

Princeton University, Princeton, NJ

Postdoctoral Fellow, Department of Computer Science 1/2010 – 7/2011

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

Honors, Awards and Recognitions

Minjiang Scholar Honorary Professor, Xiamen University, Information Science & Engineering, 2019–2022
Honorary Visiting Professor, Xidian University, Electronic Engineering, 2019–2022
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 for Achievement in ECE, Duke University, May 2004

Publications

Journal Papers

1. S. Gultekin and J. Paisley (2019). Online forecasting matrix factorization, *IEEE Transactions on Signal Processing*, vol. 67, no. 5, pp. 1223-1236.
2. B. Holtzman, A. Pate, J. Paisley, F. Waldhauser and D. Repetto (2018). Machine learning reveals cyclic changes in seismic source spectra in Geysers geothermal field, *Science Advances*, vol. 4 no. 5.
3. L. Lei, Z. Feng, X. Bai and J. Paisley (2018). A modified EM algorithm for ISAR scatterer trajectory matrix completion, *IEEE Transactions on Geoscience and Remote Sensing*, vol. 56, no. 7, pp. 3953-3962.
4. X. Cao, F. Zhou, L. Xu, D. Meng, Z. Xu and J. Paisley (2018). Hyperspectral image classification with Markov random fields and a convolutional neural network, *IEEE Transactions on Image Processing*, vol. 27, no. 5, pp. 2354-2367.

5. S. Gultekin and J. Paisley (2017). Nonlinear Kalman filtering with divergence minimization, *IEEE Transactions on Signal Processing*, vol. 65, no. 23, pp. 6319-6331.
6. 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*, vol. 26, no. 6, pp. 2944-2956.
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. M. Hoffman, D. Blei, C. Wang and J. Paisley (2013). Stochastic variational inference, *Journal of Machine Learning Research*, vol. 14, pp. 1303-1347.
13. J. Paisley, C. Wang and D. Blei (2012). The discrete infinite logistic normal distribution, *Bayesian Analysis*, vol. 7, no. 2, pp. 235-272.
14. M. Zhou, H. Chen, J. Paisley, L. Ren, L. Li, Z. Xing, D. Dunson, G. Sapiro and L. Carin (2012). Non-parametric Bayesian dictionary learning for analysis of noisy and incomplete images, *IEEE Transactions on Image Processing*, vol. 21, no. 1, pp. 130-144.
15. 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.
16. 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.
17. 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.
18. 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.
19. 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.
20. 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.
21. 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.

Conference Papers

22. A. Zhang and J. Paisley (2019). Random function priors for correlation modeling, *International Conference on Machine Learning*, Long Beach, CA, USA.
23. L. Sun, Z. Fan, X. Ding, Y. Huang and J. Paisley (2019). Joint CS-MRI reconstruction and segmentation with a unified deep network, *Conference on Information Processing in Medical Imaging*, Hong Kong, China.
24. A. Zhang, Q. Wang, Z. Zhu, J. Paisley and C. Wang (2019). Fully supervised speaker diarization, *IEEE International Conference on Acoustics, Speech and Signal Processing*, Brighton, UK.

25. M. Ibrahim, M. Louie, C. Modarres and J. Paisley (2019). Global explanations of neural networks: Mapping the landscape of predictions, *AAAI/ACM Conference on AI, Ethics, and Society*, Honolulu, HI, USA.
26. S. Gultekin, A. Zhang and J. Paisley (2018). Asymptotic simulated annealing for variational inference, *IEEE Global Communications Conference*, Abu Dhabi, UAE.
27. Z. Fan, L. Sun, X. Ding, Y. Huang, C. Cai and J. Paisley (2018). A segmentation-aware deep fusion network for compressed sensing MRI, *European Conference on Computer Vision*, Munich, Germany.
28. G. Fazelnia and J. Paisley (2018). CRVI: Convex relaxation for variational inference, *International Conference on Machine Learning*, Stockholm, Sweden.
29. A. Zhang and J. Paisley (2018). Deep Bayesian nonparametric tracking, *International Conference on Machine Learning*, Stockholm, Sweden.
30. S. Cai, J. Huang, D. Zeng, X. Ding and J. Paisley (2018). MEnet: A metric expression network for salient object segmentation, *International Joint Conference on Artificial Intelligence*, Stockholm, Sweden.
31. L. Sun, Z. Fan, Y. Huang, X. Ding and J. Paisley (2018). Compressed sensing MRI using a recursive dilated network, *AAAI Conference on Artificial Intelligence*, New Orleans, LA, USA.
32. A.B. Dieng, D. Tran, R. Ranganath, J. Paisley and D. Blei (2017). Variational inference via χ upper bound minimization, *Advances in Neural Information Processing Systems*, Long Beach, CA, USA.
33. J. Yang, X. Fu, Y. Hu, Y. Huang, X. Ding and J. Paisley (2017). PanNet: A deep network architecture for pan-sharpening, *International Conference on Computer Vision*, Venice, Italy.
34. 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.
35. 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.
36. A. Zhang and J. Paisley (2016). Markov latent feature models, *International Conference on Machine Learning*, New York, NY, USA.
37. A. Zhang, S. Gultekin and J. Paisley (2016). Stochastic variational inference for the HDP-HMM, *International Conference on Artificial Intelligence and Statistics*, Cadiz, Spain.
38. 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.
39. 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.
40. A. Zhang and J. Paisley (2015). Markov mixed membership models, *International Conference on Machine Learning*, Lille, France.
41. D. Liang and J. Paisley (2015). Landmarking manifolds with Gaussian processes, *International Conference on Machine Learning*, Lille, France.
42. S. Sertoglu and J. Paisley (2015). Scalable Bayesian nonparametric dictionary learning, *European Signal Processing Conference*, Nice, France. (invited paper)
43. S. Gultekin and J. Paisley (2014). A collaborative Kalman filter for time-evolving dyadic processes, *IEEE International Conference on Data Mining*, Shenzhen, China.
44. 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.
45. 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.
46. 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)**

47. 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.
48. J. Paisley, D. Blei and M.I. Jordan (2012). Variational Bayesian inference with stochastic search, *International Conference on Machine Learning*, Edinburgh, Scotland.
49. 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.
50. J. Paisley, L. Carin and D. Blei (2011). Variational inference for stick-breaking beta process priors, *International Conference on Machine Learning*, Bellevue, WA, USA.
51. 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**)
52. 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.
53. 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.
54. 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.
55. 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.
56. 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.
57. 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.
58. 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.
59. J. Paisley and L. Carin (2009). Nonparametric factor analysis with beta process priors, *International Conference on Machine Learning*, Montreal, Canada.
60. J. Paisley and L. Carin (2009). Dirichlet process mixture models with multiple modalities, *IEEE International Conference on Acoustics, Speech and Signal Processing*, Taipei, Taiwan.
61. 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

62. 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

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

Professional Activities

Conference Senior Program Committee

International Conference on Machine Learning (ICML), 2015, 2018
Neural Information Processing Systems (NeurIPS), 2018, 2019
Artificial Intelligence and Statistics (AISTATS), 2014, 2015, 2017
Uncertainty in Artificial Intelligence (UAI), 2019
International Joint Conference on Artificial Intelligence (IJCAI), 2015, 2016, 2017, 2019
AAAI Conference on Artificial Intelligence (AAAI), 2018

Conference and Workshop Organization

NeurIPS Workshop on Challenges and Opportunities for AI in Financial Services, 2018
IEEE International Conference on Visual Communications and Image Processing (special sessions), 2018
IEEE International Workshop on Multimedia Signal Processing (special sessions), 2015
International Conference on Machine Learning (volunteers), 2014
Topic contributed session (organizer and chair), Joint Statistical Meetings, 2013

Selected Journal Reviewing

Annals of Applied Statistics (IMS)
Bayesian Analysis (ISBA)
Bernoulli Journal (IMS)
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
Technometrics (ASA)

Selected Conference Reviewing

AAAI Conference on Artificial Intelligence (AAAI) 2012, 2019
Artificial Intelligence and Statistics (AISTATS) 2012, 2013, 2016, 2019
Conference on Computer Vision and Pattern Recognition (CVPR) 2018, 2019
International Conference on Computer Vision (ICCV), 2019
International Conference on Learning Representations (ICLR) 2018, 2019
International Conference on Machine Learning (ICML) 2010, 2012, 2013, 2014, 2016, 2017, 2019
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, statistics related books

Columbia University

Data Science Institute, core faculty

Co-Chair, Foundations of Data Science Center, Data Science Institute, starting 7/2019

Education Committee, Data Science Institute, 2015 – present

Research Initiatives in Science & Engineering (RISE) grant review panel, 2015, 2017, 2018

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 on edX (Computer Science): Machine Learning, Spring 2017 – present

Emeritus Institute Online (Columbia Business School): Applied Machine Learning, Fall 2018 – present

EECS 6720: Bayesian Models for Machine Learning, F'16, F'17, F'18, (as EECS 6892) S'14, F'15

ELEN 4720: Machine Learning for Signals, Information and Data, S'20, (as ELEN 4903) S'16, S'18

COMS 4721: Machine Learning for Data Science, S'15, S'17, S'19

EECS 9601: Topic: Advanced Probabilistic Machine Learning, F'19, (as ELEN 9801) F'14

Ph.D. Supervision

San Gultekin (EE, 2013 – 2019) Successfully defended in April 2019

Aonan Zhang (EE, 2014 – present)

Ghazal Fazelnia (EE, 2015 – present)

Adji Bouso Dieng (Statistics, 2016 – present)

Arunesh Mittal (EE, 2018 – present)

Wei Zhang (EE, 2019 – present)

Aditya Makkar (EE, 2019 – present)

Ph.D. Committees (completed)

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)

Yingming Tsai (Columbia University, Electrical Engineering, 2017)
Yuqian Zhang (Columbia University, Electrical Engineering, 2018)
Gonzalo Mena (Columbia University, Statistics, 2018)
Nikul Ukani (Columbia University, Electrical Engineering, 2018)
Maja Rudolph (Columbia University, Computer Science, 2018)
Guoqing Zheng (Carnegie Mellon University, Computer Science, 2018)
Qing Qu (Columbia University, Electrical Engineering, 2018)
Samet Ozturk (Columbia University, Earth and Environmental Engineering, 2019)

Invited Talks

- 2019** ISBA Conference on Bayesian Nonparametrics, Oxford, UK
Xiamen University, Information Science & Engineering (short course)
Xidian University, Electronic Engineering Seminar
Xi'an Jiaotong University, Applied Mathematics Seminar
- 2018** Xiamen University, Information Science Seminar
9th MPSEED Workshop, Chinese Academy of Sciences, Kunming, China
Google AI China Center, Beijing
The Data Open: Code Edition, Citadel LLC
New York Artificial Intelligence in Healthcare Meetup
South China University of Technology, School of Mathematics (short course)
Rutgers University, Signal and Information Processing Seminar
- 2017** Xiamen University, Information Science Seminar
Xidian University, Electronic Engineering Seminar
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, Statistics and Data Analytics Meeting, keynote talk
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
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
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

Scientific Advisor

Text IQ (2017 – present) <http://www.textiq.com/>
Correlation One (2017 – present) <http://www.correlation-one.com/>

Additional Information

Languages: Mandarin Chinese (HSK 5), English
Citizenship: USA