

John Paisley

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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 Researcher, EECS Computer Science Division. Advisor: Michael I. Jordan 7/2011 – 7/2013

Princeton University, Princeton, NJ

Postdoctoral Researcher, Department of Computer Science. Advisor: David Blei 1/2010 – 7/2011

Education

Duke University, Durham, NC

Ph.D. Electrical and Computer Engineering, May 2010. Advisor: Lawrence Carin
M.S. Electrical and Computer Engineering, May 2007
B.S.E. Electrical and Computer Engineering, Computer Science; Minor: Classical Studies, May 2004

Harvard University Extension School, Cambridge, MA

Master of Liberal Arts (ALM), Field: History, November 2020

Honors and Awards

Klein Family History Prize (ALM thesis award), Harvard Extension School, 2021
Best Paper Award, Signal Processing Journal (Elsevier), European Association for Signal Processing, 2020
Minjiang Scholar Professor (honorary), Xiamen University, Information Science & Engineering, 3/19 – 8/22
Distinguished Faculty Teaching Award, Columbia School of Engineering & Applied Science, 2017
Top 10% Paper Recognition, IEEE International Conference on Image Processing (ICIP), 2013
Notable Paper Award, International Conference on Artificial Intelligence and Statistics (AISTATS), 2011
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. H. Lin, W. Zeng, Y. Zhuang, X. Ding, Y. Huang and J. Paisley (2023). Learning rate dropout, *IEEE Transactions on Neural Networks and Learning Systems*, vol. 34, pp. 9029-9039.
2. M. Liu, J. Huang, D. Zeng, X. Ding and J. Paisley (2023). A multiscale approach to deep blind image quality assessment, *IEEE Transactions on Image Processing*, vol. 32, pp. 1656-1667.

3. T. Sawi, B. Holtzman, F. Walter and J. Paisley (2022). An unsupervised machine-learning approach to understanding seismicity at an alpine glacier, *Journal of Geophysical Research: Earth Surface*, vol. 127, no. 12.
4. L. Sun, C. Li X. Ding, Y. Huang, Z. Chen, G. Wang, Y. Yu and J. Paisley (2022). Few-shot medical image segmentation using a global correlation network with discriminative embedding, *Computers in Biology and Medicine*, vol. 140, 105067.
5. X. Fu, Q. Qi, Z-J. Zha, X. Ding, J. Paisley and F. Wu (2021). Successive graph convolutional network for image de-raining. *International Journal of Computer Vision: Special Issue on Computer Vision for All Seasons: Adverse Weather and Lighting Conditions*, vol. 129, no. 5, pp. 1691-1711.
6. X. Fu, W. Wang, Y. Huang, X. Ding and J. Paisley (2021). Deep multiscale detail networks for multi-band spectral image sharpening, *IEEE Transactions on Neural Networks and Learning Systems*, vol. 32, no. 5, pp. 2090-2104.
7. H. Lin, Y. Li, X. Fu, X. Ding, Y. Huang and J. Paisley (2020). Rain O'er Me: Synthesizing real rain to derain with data distillation, *IEEE Transactions on Image Processing*, vol. 29, pp. 7668-7680.
8. L. Sun, Y. Wu, B. Shu, X. Ding, C. Cai, Y. Huang and J. Paisley (2020). A dual-domain deep lattice network for rapid MRI reconstruction, *Neurocomputing*, vol. 397, pp. 94-107.
9. S. Gultekin, A. Sana, A. Ratnaparkhi and J. Paisley (2020). MBA: Mini-batch AUC optimization, *IEEE Transactions on Neural Networks and Learning Systems*, vol. 31, no. 12, pp. 5561-5574.
10. L. Sun, J. Wang, Y. Huang, X. Ding, H. Greenspan and J. Paisley (2020). An adversarial learning approach to medical image synthesis for lesion detection, *IEEE Journal of Biomedical and Health Informatics*, vol. 24, no. 8, pp. 2303-2314.
11. L. Sun, W. Ma, X. Ding, Y. Huang, D. Liang and J. Paisley (2020). A 3D spatially-weighted network for segmentation of brain tissue from MRI, *IEEE Transactions on Medical Imaging*, vol. 39, no. 4, pp. 898-909.
12. X. Fu, B. Liang, Y. Huang, X. Ding and J. Paisley (2020). Lightweight pyramid networks for image deraining, *IEEE Transactions on Neural Networks and Learning Systems*, vol. 31, no. 6, pp. 1794-1807.
13. L. Sun, Z. Fan, X. Ding, Y. Huang and J. Paisley (2019). Region-of-interest undersampled MRI reconstruction: A deep convolutional neural network approach, *Magnetic Resonance Imaging*, vol. 63, pp. 185-192.
14. L. Sun, Z. Fan, X. Ding, C. Cai, Y. Huang and J. Paisley (2019). A divide-and-conquer approach to compressed sensing MRI, *Magnetic Resonance Imaging*, vol. 63, pp. 37-48.
15. L. Sun, Z. Fan, X. Fu, Y. Huang, X. Ding and J. Paisley (2019). A deep information sharing network for multi-contrast compressed sensing MRI reconstruction, *IEEE Transactions on Image Processing*, vol. 28, no. 12, pp. 6141-6153.
16. S. Gultekin and J. Paisley (2019). Online forecasting matrix factorization, *IEEE Transactions on Signal Processing*, vol. 67, no. 5, pp. 1223-1236.
17. 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.
18. 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.
19. 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.
20. S. Gultekin and J. Paisley (2017). Nonlinear Kalman filtering with divergence minimization, *IEEE Transactions on Signal Processing*, vol. 65, no. 23, pp. 6319-6331.
21. 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.
22. 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.

23. 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.
24. 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.
25. 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.
26. 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.
27. M. Hoffman, D. Blei, C. Wang and J. Paisley (2013). Stochastic variational inference, *Journal of Machine Learning Research*, vol. 14, pp. 1303-1347.
28. J. Paisley, C. Wang and D. Blei (2012). The discrete infinite logistic normal distribution, *Bayesian Analysis*, vol. 7, no. 2, pp. 235-272.
29. 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.
30. 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.
31. 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.
32. 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.
33. 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.
34. 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.
35. 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.
36. 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

37. W. Zhang, B. Barr and J. Paisley (2024). Gaussian process neural additive models, *AAAI Conference on Artificial Intelligence*, Vancouver, Canada.
38. H. Lin, Y. Zhuang, X. Ding, D. Zeng, Y. Huang, X. Tu and J. Paisley (2023). Self-supervised image denoising using implicit deep denoiser prior, *AAAI Conference on Artificial Intelligence*, Washington, DC, USA.
39. J. Paisley, S. Rowland, J. Liu, B. Coull and M. Kioumourtzoglou (2022). Bayesian nonparametric model averaging using scalable Gaussian process representations, *IEEE International Conference on Big Data*, Osaka, Japan.
40. G. Fazelnia and J. Paisley (2022). Probabilistic orthogonal matching pursuit, *IEEE International Conference on Big Data*, Osaka, Japan.
41. W. Zhang, B. Barr and J. Paisley (2022). Understanding counterfactual generation using maximum mean discrepancy, *ACM International Conference on AI in Finance*, New York, NY, USA.
42. W. Zhang, B. Barr and J. Paisley (2022). An interpretable deep classifier for counterfactual generation, *ACM International Conference on AI in Finance*, New York, NY, USA.

43. A. Mittal, J. Paisley and P. Sajda (2022). Deep metric representation learning for clinical resting state fMRI, *IEEE Engineering in Medicine and Biology Conference*, Glasgow, UK.
44. G. Fazelnia, M. Ibrahim, C. Modarres, K. Wu and J. Paisley (2020). Mixed membership recurrent neural networks for modeling customer purchases, *ACM International Conference on AI in Finance*, New York, NY, USA.
45. S. Gultekin and J. Paisley (2020). Risk bounds for low cost bipartite ranking, *Conference on Uncertainty in Artificial Intelligence*, Toronto, Canada.
46. J. Liu, J. Paisley, M.-A. Kioumourtzoglou and B. Coull (2019). Accurate uncertainty estimation and decomposition in ensemble learning, *Advances in Neural Information Processing Systems*, Vancouver, Canada.
47. T. Tu, J. Paisley, S. Haufe and P. Sajda (2019). A state-space model for inferring effective connectivity of latent neural dynamics from simultaneous EEG/fMRI, *Advances in Neural Information Processing Systems*, Vancouver, Canada.
48. X. Fu, Z. Zha, F. Wu, X. Ding and J. Paisley (2019). JPEG artifacts reduction via deep convolutional sparse coding, *International Conference on Computer Vision*, Seoul, Korea.
49. W. Wang, W. Zeng, Y. Huang, X. Ding and J. Paisley (2019). Deep blind hyperspectral image fusion, *International Conference on Computer Vision*, Seoul, Korea.
50. A. Zhang and J. Paisley (2019). Random function priors for correlation modeling, *International Conference on Machine Learning*, Long Beach, CA, USA.
51. 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.
52. 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.
53. 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.
54. S. Gultekin, A. Zhang and J. Paisley (2018). Asymptotic simulated annealing for variational inference, *IEEE Global Communications Conference*, Abu Dhabi, UAE.
55. 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.
56. G. Fazelnia and J. Paisley (2018). CRVI: Convex relaxation for variational inference, *International Conference on Machine Learning*, Stockholm, Sweden.
57. A. Zhang and J. Paisley (2018). Deep Bayesian nonparametric tracking, *International Conference on Machine Learning*, Stockholm, Sweden.
58. 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.
59. 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.
60. 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.
61. 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.
62. 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.
63. 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.
64. A. Zhang and J. Paisley (2016). Markov latent feature models, *International Conference on Machine Learning*, New York, NY, USA.

65. A. Zhang, S. Gultekin and J. Paisley (2016). Stochastic variational inference for the HDP-HMM, *International Conference on Artificial Intelligence and Statistics*, Cadiz, Spain.
66. 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.
67. 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.
68. A. Zhang and J. Paisley (2015). Markov mixed membership models, *International Conference on Machine Learning*, Lille, France.
69. D. Liang and J. Paisley (2015). Landmarking manifolds with Gaussian processes, *International Conference on Machine Learning*, Lille, France.
70. S. Sertoglu and J. Paisley (2015). Scalable Bayesian nonparametric dictionary learning, *European Signal Processing Conference*, Nice, France. (invited paper)
71. S. Gultekin and J. Paisley (2014). A collaborative Kalman filter for time-evolving dyadic processes, *IEEE International Conference on Data Mining*, Shenzhen, China.
72. 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.
73. 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.
74. 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.
75. J. Xie, Y. Huang, J. Paisley, X. Ding and X. Zhang (2013). Pan-sharpening based on nonparametric Bayesian adaptive dictionary learning, *IEEE International Conference on Image Processing*, Melbourne, Australia.
76. J. Paisley, D. Blei and M.I. Jordan (2012). Variational Bayesian inference with stochastic search, *International Conference on Machine Learning*, Edinburgh, Scotland.
77. 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.
78. J. Paisley, L. Carin and D. Blei (2011). Variational inference for stick-breaking beta process priors, *International Conference on Machine Learning*, Bellevue, WA, USA.
79. 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.
80. 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.
81. 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.
82. 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.
83. 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.
84. 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.
85. 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.

86. 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.
87. J. Paisley and L. Carin (2009). Nonparametric factor analysis with beta process priors, *International Conference on Machine Learning*, Montreal, Canada.
88. J. Paisley and L. Carin (2009). Dirichlet process mixture models with multiple modalities, *IEEE International Conference on Acoustics, Speech and Signal Processing*, Taipei, Taiwan.
89. 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

90. 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

91. J. Paisley (2020). *Bertrand Russell and China During and After His Visit in 1920*. A.L.M. Thesis, Harvard University Extension School.
92. J. Paisley (2010). *Machine Learning with Dirichlet and Beta Process Priors: Theory and Applications*. Ph.D. Dissertation, Duke University.
93. J. Paisley (2007). *Machine Learning Applications in Music Recommendation*. M.S. Thesis, Duke University.

Selected Professional Activities

Senior Program Committee / Area Chair

International Conference on Machine Learning (ICML), 2015, 2018, 2020, 2021, 2022
 Neural Information Processing Systems (NeurIPS), 2018, 2019, 2020, 2021, 2022, 2023
 Artificial Intelligence and Statistics (AISTATS), 2014, 2015, 2017, 2022, 2023, 2024
 Uncertainty in Artificial Intelligence (UAI), 2019, 2023, 2024
 International Joint Conference on Artificial Intelligence (IJCAI), 2015, 2016, 2017, 2019, 2020, 2021
 AAAI Conference on Artificial Intelligence (AAAI), 2018, 2020, 2021, 2022, 2023, 2024
 International Conference on Learning Representations (ICLR), 2021, 2022, 2024

Conference and Workshop Organization

NeurIPS Workshop on Fair AI in Finance (co-organizer), 2020
 NeurIPS Workshop on Challenges and Opportunities for AI in Financial Services (co-organizer), 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

Associate Editor

IEEE Transactions on Pattern Analysis and Machine Intelligence, 2019 – 2020

Teaching at Columbia University

EECS 6720: Bayesian Models for Machine Learning, F16, F17, F18, F20, F23 (as EECS 6892) S14, F15
ELEN 4720: Machine Learning for Signals, Information and Data, S20, F21, S24 (as ELEN 4903) S16, S18
COMS 4721: Machine Learning for Data Science, S15, S17, S19, S21, S23
EECS 9601: Topic: Advanced Probabilistic Machine Learning, F19, S22 (as ELEN 9801) F14
ENGI 4800: Data Science Capstone & Ethics (mentor, with Marianthi-Anna Kioumourtzoglou), F19
ColumbiaX on edX (Computer Science): Machine Learning

Ph.D. Supervision

San Gultekin (EE, 2013 – 2019) Defended in April 2019
Aonan Zhang (EE, 2014 – 2019) Defended in September 2019
Ghazal Fazelnia (EE, 2015 – 2019) Defended in September 2019
Adji Bousso Dieng (Statistics, 2016 – 2020) Defended in April 2020
Arunesh Mittal (EE, 2018 – 2023) Defended in May 2023
Wei Zhang (EE, 2019 – present)
Aditya Makkar (EE, 2019 – May 2022)

Scientific Advisor

Text IQ (2017 – 2021) <http://www.textiq.com>
Correlation One (2017 – 2021) <http://www.correlation-one.com>

Other Information

Google Scholar: https://scholar.google.com/citations?user=r31_fYQAAAAJ&hl=en
Patent: M. Ibrahim, J. Paisley, C. Modarres and M. Louie. Techniques to perform global attribution mappings to provide insights in neural networks. U.S. Patent 11,568,263, January 31, 2023.
Other languages: Mandarin Chinese (HSK 5), Japanese (JLPT N4)
Citizenship: USA