Gavin Kerrigan

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Research

Postdoctoral Research Assistant in Machine Learning Feb. 2025 - July 2027

University of Oxford, Department of Statistics

RainML Lab (PI: Tom Rainforth)

Graduate Student Researcher Sep. 2019 - Dec. 2024

University of California, Irvine, Department of Computer Science

DataLab (PI: Padhraic Smyth)

Research Assistant Sep. 2018 - June 2019

The Pennsylvania State University, Department of Computer Science

Education

Ph.D., Computer Science Sep. 2019 - Dec. 2024

University of California, Irvine GPA: 4.0/4.0

Thesis: Infinite-Dimensional Generative Models through the Transport of Measure

Advisor: Padhraic Smyth

B.Sc., Mathematics 2015 - 2019

The Pennsylvania State University, Schreyer Honors College GPA: 3.98/4.0

Thesis: Estimating Noisy Histograms with Quality Guarantees

Minor: Physics

Teaching

Instructor March 2023 - June 2023

CS 178: Machine Learning and Data Mining, UC Irvine

- Enrollment: 162

Head Teaching Assistant Sep. 2022 - Dec. 2022

CS 178: Machine Learning and Data Mining, UC Irvine

- Managed a team of 5 graduate TAs in a course with an enrollment of 272
- Developed homework assignments, weekly discussions, exams, and rubrics

Guest Lecturer

CS 274E: Deep Generative Models, UC Irvine Nov. 2022, Nov. 2023, Nov. 2024

Private Tutor Jul. 2019 - Present

Machine learning, mathematics, and statistics

- Perfect (5.0/5.0) rating across more than 300 hours of tutoring and 200 reviews
- Supervised research projects ranging from the high school level to the Ph.D. level

Mathematics Tutor and Peer Coordinator Jan. 2017 - June 2019

Penn State Learning

- Tutored undergraduate mathematics courses in one-on-one and small group settings
- Trained, supervised, and interviewed a team of more than 60 undergraduate tutors

Publications

* denotes joint authorship

Conference

1. **G. Kerrigan**, G. Migliorini, P. Smyth, 'Dynamic Conditional Optimal Transport through Simulation-Free Flows,' *Advances in Neural Information Processing Systems 38 (NeurIPS 2024)*, to appear, 2024.
2. P. Srivastava, R. Yang, **G. Kerrigan**, G. Dresdner, J. McGibbon, C. Bretherton, S. Mandt, 'Precipitation Downscaling with Spatiotemporal Video Diffusion,' *Advances in Neural Information Processing Systems 38 (NeurIPS 2024)*, to appear, 2024.
3. **G. Kerrigan**, G. Migliorini, P. Smyth, 'Functional Flow Matching,' *Proceedings of the 27th International Conference on AI and Statistics (AISTATS)*, Proceedings of Machine Learning Research, PMLR 238:3934-3942, April 2024 **(Oral, Outstanding Student Paper Highlight (7/1802))**.
4. **G. Kerrigan**, J. Ley, P. Smyth, 'Diffusion Generative Models in Infinite Dimensions,' *Proceedings of the 26th International Conference on AI and Statistics (AISTATS)*, Proceedings of Machine Learning Research, PMLR 206:9538–9563, April 2023.
5. **G. Kerrigan**, P. Smyth, and M. Steyvers, 'Combining Human Predictions with Model Probabilities via Confusion Matrices and Calibration,' *Advances in Neural Information Processing Systems 34 (NeurIPS 2021)*, pp.4421–4434, 2021.

Journal

6. M. Steyvers, H. Tejeda, **G. Kerrigan**, P. Smyth, 'Bayesian Modeling of Human-AI Complementarity,' *Proceedings of the National Academy of Sciences*, 19(11):1-7, March 2022.

Workshop

7. **G. Kerrigan***, D. Slack*, J. Tuyls*, 'Differentially Private Language Models Benefit from Public Pre-Training,' *PrivateNLP: EMNLP Workshop on Privacy and Natural Language Processing*, pp.39-45, 2020.
8. **G. Kerrigan**, G. Migliorini, P. Smyth, 'Functional Flow Matching,' *NeurIPS Workshop on Diffusion Models*, 2023.

Under Review

9. A. Mammadov, J. Yao, J. Berner, **G. Kerrigan**, J. C. Ye, K. Azizzadenesheli, A. Anandkumar, 'Guided Diffusion Sampling on Function Spaces with Applications to PDEs,' *Under review*, January 2025.

10. **G. Kerrigan,** K. Nelson, P. Smyth, 'EventFlow: Forecasting Continuous-Time Event Data with Flow Matching,' *Under review*, arXiv:2410.07430, October 2024.
11. C. Guilloteau, **G. Kerrigan,** K. Nelson, G. Migliorini, P. Smyth, R. Li, E. Foufoula-Georgiou, 'A Generative Diffusion Model for Probabilistic Ensembles of Precipitation Maps Conditioned on Multisensor Satellite Observations,' *Under review*, arXiv:2409.16319, September 2024.

Honors and Awards

University of California, Irvine

Hasso Plattner Institute Fellowship	2021 - 2024
Graduate Dean's Recruitment Fellowship	2019

The Pennsylvania State University

Steven and Sherry McCrystal Mathematics Award	2019
Mary Lister McCammon Scholarship	2017, 2018
Phi Beta Kappa Honors Society	2017
Hay Memorial Scholarship	2016
Mahle Trustee Scholarship in Science	2015

Invited Talks

Generative Models and the Transport of Measure

Anandkumar Group, Caltech	August 2024
University of Southern California (USC)	October 2024
Yu Group, University of California San Diego (UCSD)	October 2024

Diffusion Generative Models: Methods and Applications

NASA Jet Propulsion Laboratory (JPL)	June 2024

Functional Flow Matching

The 27th International Conference on AI and Statistics (AISTATS)	May 2024

Deep Generative Models in Infinite-Dimensional Spaces

Center for Machine Learning Seminar, UC Irvine	Jan. 2024
Probability and Combinatorics Seminar, UC Irvine	Nov. 2023
AMLab Seminar, University of Amsterdam	Nov. 2023

A Tutorial on Diffusion Generative Models

Hasso Plattner Institute	Sep. 2023

Service

Student Success Mentor

The Mentor Collective, UC Irvine Next Gen Pathways	2024

Workflow Chair

The 27th International Conference on AI and Statistics (AISTATS) 2024

Session Chair

The 27th International Conference on AI and Statistics (AISTATS) 2024

AI Faculty Search Committee, Student Member

UC Irvine 2021 - 2023

Machine Learning Hackathon Mentor

UC Irvine 2021

Academic Reviewing

JMLR, ICLR, CVPR, ICML, UAI, AAAI, AISTATS, NeurReps Workshop 2024

NeurIPS, AISTATS, Workshop on Deep Generative Models for Health, 2023
Workshop on Topology, Algebra, and Geometry in Data Science,
Workshop on Diffusion Models

ICML, Workshop on Geometrical and Topological Representation Learning, 2022
Workshop on Human-Machine Collaboration and Teaming

Workshop on Uncertainty in Deep Learning 2020