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The National University of Singapore
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RESEARCH INTERESTS

Uncertainty Quantification, Stochastic Simulation, Nonparametric Statistics, Machine Learning, Computer Experiments

EDUCATION

- 2018 **Ph.D.** in Operations Research
The School of Industrial & Systems Engineering, Georgia Institute of Technology, US
Advisors: Dr. C. F. Jeff Wu, Dr. Benjamin Haaland, and Dr. Rui Tuo
- 2013 **B.S.** in Information and Computing Science
Yuanpei College, Peking University, China

EXPERIENCE

- 2025.12-present Assistant Professor, Department of Industrial Systems Engineering and Management, **The National University of Singapore**, Singapore
- 2020.11-2025.12 Assistant Professor, Information Hub, **The Hong Kong University of Science and Technology (Guangzhou)**, Guangzhou, China
- 2022.06-2023.06 Assistant Professor (Joint appointment), Department of Mathematics, **The Hong Kong University of Science and Technology**, Clear Water Bay, Hong Kong
- 2020.11-2022.06 Visiting Assistant Professor, Department of Mathematics, **The Hong Kong University of Science and Technology**, Clear Water Bay, Hong Kong
- 2018.8-2020.8 Postdoctoral Fellow, **The Statistical and Applied Mathematical Sciences Institute / Duke University**, Durham, NC, US
- 2014.8-2018.7 Research assistant, **Georgia Institute of Technology**, Atlanta, GA, US
- 2015.5-2015.8 Internship, **Norfolk Southern**, Atlanta, GA, US

PUBLICATIONS

(*: These authors contributed equally to the manuscript. #: My student. ◎: Corresponding authors)

Accepted / Published

- [20] Dong, B., Mei, Y., Lu, X., Zhou, Y., Zhang, S., **Wang, W.**, & Duan, M. ◎ (2026) Gaussian-process-based sensor placement and uncertainty quantification for dynamic response reconstruction in flexible aeroelastic structures. *Mechanical Systems and Signal Processing*, 257, 114426.
- [19] Zhang, Q. #, & **Wang, W.** ◎ (2025). Sobolev Calibration of Imperfect Computer Models, *Journal of the American Statistical Association*, 120(549), 408-418.
- [18] Ding, L. *, Hu, T. *, Jiang, J. #, Li, D. *, **Wang, W.** ◎, & Yao, Y. * (2024). Random smoothing regularization in kernel gradient descent learning. *Journal of Machine Learning Research*, accepted.
- [17] Sung, C.-L. * ◎, **Wang, W.** *, Ding, L., & Wang, X. (2024). Mesh-clustered Gaussian process emulator for partial differential equation systems, *Technometrics*, 66(3), 406-421.
- [16] Shi, K. #, Xiong, Y., Wang, Y., Deng, Y., **Wang, W.**, Jing, B.-Y. ◎, & Gao, X. ◎ (2024+). PractiCPP: A Deep Learning Approach Tailored for Extremely Imbalanced Datasets in Cell-

Penetrating Peptide Prediction. *Bioinformatics*, 40(2), btae058.

- [15] Sung, C.-L.[◊], Ji, Y., Mak, S., **Wang, W.**, and Tang, T. (2023). Stacking designs: designing multi-fidelity computer experiments with target predictive accuracy. *SIAM/ASA Journal on Uncertainty Quantification*, 12(1), 157-181.
- [14] **Wang, W.**^{*}, Wang, Y.^{*}, & Zhang, X.^{*◊} (2024). Smooth Nested Simulation: Bridging Cubic and Square Root Convergence Rates in High Dimensions. *Management Science*, 70(12), 9031-9057.
- [13] Wu, Y., Wang, J.[#], Miao, X.[◊], **Wang, W.**, & Yin, J. (2023). Differentiable and Scalable Generative Adversarial Models for Data Imputation. *IEEE Transactions on Knowledge and Data Engineering*, 36(2), 490-503.
- [12] Sung, C.-L.^{*◊}, **Wang, W.**^{*}, Cakoni, F., Harris, I., & Hung, Y. (2023). Functional-input Gaussian processes with applications to inverse scattering problems. *Statistica Sinica*, 34, 1883-1902.
- [11] **Wang, W.**[◊], & Jing, B.-Y. (2022). Convergence of Gaussian process regression: Optimality, robustness, and relationship with kernel ridge regression. *Journal of Machine Learning Research*, 23(193):1–67, 2022.
- [10] **Wang, W.**[◊], Yue, X., Haaland, B., & Wu, C. F. J. (2022). Gaussian Process with Input Location Error and Applications to the Composite Parts Assembly Process. *SIAM/ASA Journal on Uncertainty Quantification*, 10.2 (2022): 619-650.
- [9] **Wang, W.**[◊] (2021). On the Inference of Applying Gaussian Process Modeling to a Deterministic Function. *Electronic Journal of Statistics*, 15 (2) 5014 - 5066.
- [8] **Wang, W.**, & Zhou, Y.-H.[◊] (2021). Eigenvector-Based Sparse Canonical Correlation Analysis: Fast Computation for Estimation of Multiple Canonical Vectors. *Journal of Multivariate Analysis*, 104781.
- [7] Lee, C., Wu, J., **Wang, W.**, & Yue, X.[◊] (2021). Neural Network Gaussian Process Considering Input Uncertainty for Composite Structures Assembly. *IEEE/ASME Transactions on Mechatronics*, accepted.
- [6] Tuo, R.^{*}, & **Wang, W.**^{*◊} (2020). Kriging Prediction with Isotropic Matérn Kernels: Convergence and Robustness. *Journal of Machine Learning Research*, 21(187), 1-38.
- [5] **Wang, W.**[◊], Tuo, R., & Wu, C. F. J. (2020). On Prediction Properties of Kriging: Uniform Error Bounds and Robustness. *Journal of the American Statistical Association*, 115:530, 920-930.
- [4] Sung, C.-L.^{*◊}, **Wang, W.**^{*}, Plumlee, M., & Haaland, B. (2020). Multi-Resolution Functional ANOVA for Large-Scale, Many-Input Computer Experiments. *Journal of the American Statistical Association*, 115:530, 908-919.
- [3] **Wang, W.**, & Haaland, B.[◊] (2018). Controlling Sources of Inaccuracy in Stochastic Kriging. *Technometrics*, 61(3): 309-321.
- [2] Haaland, B.[◊], **Wang, W.**, & Maheshwari, V. (2018). A Framework for Controlling Sources of Inaccuracy in Gaussian Process Emulation of Deterministic Computer Experiments. *SIAM/ASA Journal on Uncertainty Quantification*, 6(2), 497-521.
- [1] Nie, N.[◊], Huang, J., **Wang, W.**, & Tang, Y. (2014). Solving Spatial-Fractional Partial Differential Diffusion Equations by Spectral Method. *Journal of Statistical Computation and Simulation*, 84(6), 1173-1189.

Conference

- [22] Li, G., Zhang, Y.[#], Chen, X., Li, C., Wang, B., Kong, L., **Wang, W.**, Huang, W. & Tan, M. H. Y. (2025). PANTHER: Generative Pretraining Beyond Language for Sequential User Behavior

- Modeling. *Neural Information Processing Systems (NeurIPS)*, 2025.
- [21] Yang, S.[#], Song, C.[#], Lai, Z., & **Wang, W.**[◊] (2025) KP-PINNs: Kernel Packet Accelerated Physics Informed Neural Networks. *2025 International Joint Conference on Artificial Intelligence (IJCAI)*.
- [20] Liu, R.[#], **Wang, W.**[◊], Zhang, C., & Yao, Y. (2025). Invertible TabMap: An Invertible Self-supervised Mapping for Imbalanced Classification of Tabular Data. *International Joint Conference on Neural Networks (IJCNN)*, 2025.
- [19] Fang, L.[#], Liu, R.[#], Zhang, J.[#], **Wang, W.**[◊], & Jing, B. Y.[◊] (2025). Diffusion Actor-Critic: Formulating Constrained Policy Iteration as Diffusion Noise Regression for Offline Reinforcement Learning. *The Thirteenth International Conference on Learning Representations (ICLR)*.
- [18] Li, S.^{*}, Zhang, Y.^{*#}, Li, W., Chen, H., **Wang, W.**, Jing, B. Y., Lin, S.[◊] & Hu, J.[◊] (2025). Knowledge Distillation with Multi-granularity Mixture of Priors for Image Super-Resolution. *The Thirteenth International Conference on Learning Representations (ICLR)*. (Spotlight).
- [17] Zhang, Y.^{*#}, Li, W.^{*}, Li, S., Chen, H., Tu, Z., Jing, B. Y., Lin, S., Hu, J.[◊] & **Wang, W.**[◊] (2025). AugKD: Ingenious Augmentations Empower Knowledge Distillation for Image Super-Resolution. *The Thirteenth International Conference on Learning Representations (ICLR)*.
- [16] Liu, R.^{*#}, Fang, L.^{*#}, **Wang, W.**[◊], & Jing, B. Y.[◊] (2024). D2R2: Diffusion-based Representation with Random Distance Matching for Tabular Few-shot Learning. *Neural Information Processing Systems (NeurIPS)*, 2024.
- [15] Zhang, J.^{*#}, Fang, L.^{*#}, Shi, K.[#], **Wang, W.**[◊], & Jing, B. Y.[◊] (2024). Q-Distribution guided Q-learning for offline reinforcement learning: Uncertainty penalized Q-value via consistency model. *Neural Information Processing Systems (NeurIPS)*, 2024.
- [14] Ma, J.^{*#}, Xue, S.^{*}, Hu, T.[◊], **Wang, W.**, Liu, Z., Li, Z., Ma, Z.M., & Kawaguchi, K. (2024). The Surprising Effectiveness of Skip-Tuning in Diffusion Sampling. *The Forty-first International Conference on Machine Learning (ICML)*.
- [13] Liu, X., Hu, T.[◊], **Wang, W.**, Kawaguchi, K., & Yao, Y.[◊] (2024). Referee Can Play: An Alternative Approach to Conditional Generation via Model Inversion. *The Forty-first International Conference on Machine Learning (ICML)*.
- [12] Ma, J.[#], Hu, T., & **Wang, W.**[◊] (2024). Deciphering the projection head: Representation evaluation self-supervised learning. *The 33rd International Joint Conference on Artificial Intelligence (IJCAI)*.
- [11] Ma, J.[#], Hu, T.[◊], **Wang, W.**, & Sun, J. (2023). Elucidating The Design Space of Classifier-Guided Diffusion Generation. *The Twelfth International Conference on Learning Representations (ICLR)*.
- [10] Zhang, J.[#], Zhang, C., **Wang, W.**[◊], & Jing, B. Y.[◊] (2023). Constrained Policy Optimization with Explicit Behavior Density For Offline Reinforcement Learning. *Neural Information Processing Systems (NeurIPS)*, 2023.
- [9] Hu, T., Chen, F., Wang, H., Li, J., **Wang, W.**, Sun, J.[◊], & Li, Z. (2023). Complexity Matters: Rethinking the Latent Space for Generative Modeling. *Neural Information Processing Systems (NeurIPS)*, 2023. (Spotlight).
- [8] Wang, B., Li, J.[◊], Liu, Y., Cheng, J., Rong, Y., **Wang, W.**, Tsung, F. (2023). Deep Insights into Noisy Pseudo Labeling on Graph Data. *Neural Information Processing Systems (NeurIPS)*, 2023.
- [7] Wang, J.[#], Li, H., Zhang, C., Liang, D., Yu, E., Ou, W., & **Wang, W.**[◊] (2023). CounterCLR: Counterfactual Contrastive Learning with Non-random Missing Data in Recommendation. *The IEEE International Conference on Data Mining (ICDM)*, 2023.

- [6] Hu, T., Liu, Z., Zhou, F., **Wang, W.**, & Huang, W.[◊] (2023). Your Contrastive Learning Is Secretly Doing Stochastic Neighbor Embedding. *The Eleventh International Conference on Learning Representations (ICLR)*. Accepted.
- [5] Hu, T.^{*}, Wang, J.[#], **Wang, W.**[◊], & Li, Z. (2022). Understanding Square Loss in Training Overparametrized Neural Network Classifiers. *Neural Information Processing Systems (NeurIPS)*, 2022. (Spotlight).
- [4] Tuo, R.^{*}, & **Wang, W.**[◊]. (2022). Uncertainty Quantification for Bayesian Optimization. *In the 25th International Conference on Artificial Intelligence and Statistics (AISTATS)*, PMLR 151:2862-2884, 2022.
- [3] Hu, T.^{*}, **Wang, W.**^{*}, Lin, C., & Cheng, G.[◊] (2021). Regularization Matters: A Nonparametric Perspective on Overparametrized Neural Network. *In the 24th International Conference on Artificial Intelligence and Statistics (AISTATS)*. Proceedings, pages 829-837.
- [2] Chokshi, T., Eo., J., Sonico, J., Su, A., **Wang, W.**, Wu, S., Zhou, C.[◊], & Zhu, Y. (2015) Structured Comparison of Pallet Racks and Gravity Flow Racks. *IIE Annual Conference 2015*. Proceedings, pages 1971 - 1980.
- [1] Huang, J.[◊], Tang, Y., **Wang, W.**, & Yang, J. (2012). A Compact Difference Scheme for Time Fractional Diffusion Equation with Neumann Boundary Conditions. *Asia Simulation Conference 2012*. Proceedings, pages 273-284.

AWARDS

- | | |
|---|------|
| • NUS Presidential Young Professor
The National University of Singapore | 2026 |
| • Nomination of Teaching Award
The Hong Kong University of Science and Technology (Guangzhou) | 2023 |
| • Winner, Best Student Poster Competition
Georgia Statistics Day, Emory University | 2017 |
| • Third Place, Microsoft Data Science Challenge (Topic: When to sell your home)
Data Science at Georgia Institute of Technology | 2016 |
| • Kiplinger Fellowship
Industrial and Systems Engineering, Georgia Institute of Technology | 2014 |

TEACHING

- Instructor** (Hong Kong University of Science and Technology (Guangzhou))
- UFUG 1106 Honor Calculus II (Spring 2024)
 - UFUG 1105 Honor Calculus I (Fall 2023)
 - MATH 5431 Advanced Mathematical Statistics I (Fall 2021)
 - DSAA 5009 Deep Learning in Data Science (Spring 2021, Spring 2022, Spring 2023, Spring 2024)
 - DSAA 6000C Empirical Process (Fall 2022)
- Instructor** (Duke University, US)
- STA 230 Probability (Summer 2020)
- Workshop Research Instructor** (The Statistical and Applied Mathematical Sciences Institute, US)
- Undergraduate Modeling Workshop (May 2019)

Special Topic Lecturer (The Statistical and Applied Mathematical Sciences Institute, US)

- The Story of Data Science and Machine Learning Workshop (March 2019)
- Undergraduate Workshop on Model Uncertainty: Mathematical and Statistical (February 2019)

Graduate Teaching Assistant (Georgia Institute of Technology, US)

- ISyE 3044 Simulation Analysis and Design (Summer 2014)
- ISyE 3770 Statistics and Applications (Spring 2014)
- ISyE 4031 Regression and Forecasting (Spring 2014)
- ISyE 3044 Simulation Analysis (Spring 2014)

SERVICES

- Journal or conference reviewer:

Journal: *Operations Research*, *Journal of the American Statistical Association*, *Journal of Machine Learning Research*, *IEEE Transactions on Information Theory*, *IEEE Transactions on Knowledge and Data Engineering*, *Naval Research Logistics*, *European Journal of Operational Research*, *SIAM/ASA Journal on Uncertainty Quantification*, *Statistica Sinica*, *Journal of Computational and Graphical Statistics*, *Technometrics*, *Statistical Analysis and Data Mining*, *IIE Transactions*, etc.

Conference: *MSML21*, *MSML22*, *AISTATS22*, *AISTATS23*, *NeurIPS24*, *ICLR25*, etc.

- Area Chair: *ICLR26*, *NeurIPS26*