Da Long

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EDUCATION

The University of Utah, Salt Lake City, Utah
Ph.D. student in Computer Science, Expected May 2026
- Advisor: Shandian Zhe

The University of Arizona, Tucson, Arizona
B.S. in Computer Science, GPA: 4.0 Dec. 2020
B.S. in Mathematics, GPA: 4.0 Dec. 2020

RESEARCH INTERESTS

Probabilistic Learning: Bayesian Modeling, Uncertianty Quantification, Gaussian Process, Approximate Inference

AI for Science: Physics Informed Machine Learning, Surrogate Modeling, Operator Learning, Equation Discovery

RESEARCH EXPERIENCE

Learning high-frequent and multi-scale solutions via Gaussian Process
- Derived a new kernel to extract the high frequencies
- Developed a Gaussian Process based method to solve ODE/PDEs with high-frequent and multi-scale solutions

Kernel method for Operator Learning
- Learning the mapping between function spaces based on kernel method
- Beat the state-of-the-art methods including FNO, DeepONet, and POD-DeepONet

Physics Informed Neural Networks for Learning high-frequent and multi-scale solutions
- Developed a Fourier bases based physics informed neural networks
- Achieved best performance compared with state-of-the-art methods

Gaussian Process for ODE/PDEs discovery
- Developed a probabilistic model to discovery underlying equations from very sparse data based on spike-and-slab
- Successfully discovered underlying equations with very sparse data while the start-of-the-art method failed

Gaussian Process for Solving ODE/PDEs
- Developed a Gaussian Process framework to solve ODE/PDEs
- Quantified uncertainty for ODE/PDE system solutions

ACADEMIC SERVICES

Conference Reviewer

- AISTATS 2023
- ICML 2022

TEACHING EXPERIENCE

The University of Utah
Teaching Mentorships
- **CS 6350 Machine Learning (Fall 2022)**
- **CS 6190 Probabilistic Machine Learning (Spring 2023)**

PUBLICATIONS

- **Long D.**, Wang Z., Krishnapriyan A., Kirby R., Zhe S., & Mahoney M. (2022). AutoIP: A United Framework to Integrate Physics into Gaussian Processes. In *International Conference on Machine Learning (ICML 2022)*.

PAPERS IN SUBMISSION

- **Long D.**, Xing W., Krishnapriyan A., Kirby R., Zhe S., & Mahoney M., Equation Discovery with Bayesian Spike-and-Slab Priors and Efficient Kernels.
- Fang S., Cooley M., **Long D.**, Li S., Kirby R., & Zhe S., Solving High Frequency and Multi-Scale PDEs with Gaussian Processes.
- Cooley M., **Long D.**, Kirby R., & Zhe S., Fourier PINNs: From Strong Boundary Conditions to Adaptive Fourier Bases.
- **Long D.**, Mrvaljevic N., Zhe S., & Hosseini B., A Kernel Approach for PDE Discovery and Operator Learning.