Da Long

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EDUCATION

The University of Utah, Salt Lake City, Utah
Ph.D. student in Computer Science, GPA: 3.88, Expected May 2026
- Advisor: Shandian Zhe

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

RESEARCH INTERESTS

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

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

SKILLS

Technical: Python, Matlab, C, Java, Pytorch, Jax, LaTex

RESEARCH EXPERIENCE

Learning high-frequent and multi-scale solutions via Gaussian Process
- Selection and learning of high frequent components through a spectral mixture kernel

Kernel method for Operator Learning
- Outperformed leading methods including FNO, DeepONet, and POD-DeepONet in sparse data

Gaussian Process for ODE/PDEs discovery via spike-and-slab
- Succeed in discovering underlying equations in sparse datasets using a probabilistic approach while state-of-the-art method failed

Gaussian Process for Solving ODE/PDEs
- Developed a Gaussian Process framework to solve ODE/PDEs and quantified solution uncertainties through variational inference

Physics Informed Neural Networks for Learning high-frequent and multi-scale solutions
- Enhanced Physics Informed Neural Networks (PINNs) with Fourier bases, achieved best accuracy compared to state-of-the-art methods

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.
- **Long D.**, Mrvaljevic N., Zhe S., & Hosseini B., A Kernel Approach for PDE Discovery and Operator Learning.
- 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.