Shibo Li

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Contact Information

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Research Interests

Probabilistic Learning : Bayesian Modeling, Approximate Inference, Uncertainty Quantification of Deep Models

AI for Science : Surrogate Modeling, Operator Learning, Physical-Informed Machine Learning

Multi-Objective Learning: Multi-Task Learning, Multi-Fidelity Learning, Transfer Learning, Meta Learning

Interactive Machine Learning: Bayesian Optimization, Active Learning, Multi-armed Bandits, Reinforcement Learning

Education

The University of Utah, Salt Lake City, Utah

Ph.D. Student, Computer Science (expected graduation date: May 2024)

- Dissertation Topic: "Multi-Fidelity Learning and Optimization for Physical Simulation"
- Advisor: Shandian Zhe

University of Pittsburgh, Pittsburgh, Pennsylvania

M.S., Mechanical Engineering, Dec, 2013

South China University of Technology, Guangzhou, Guangdong, China

B.E., Mechatronics and Robotics, Jun, 2012

Publications

Li, S., Yu, X., Xing, W., Kirby M., Narayan, A., & Zhe, S. (2024). Multi-Resolution Active Learning of Fourier Neural Operators, *The 27th International Conference on Artificial Intelligence and Statistics (AISTATS 2024)* . (**Oral presentation**)

Fang, S., Yu, X., Wang, Z., **Li, S.**, Kirby, M., & Zhe, S. (2024). Functional Bayesian Tucker Decomposition for Continuous-indexed Tensor Data, *In Twelfth International Conference on Learning Representations (ICLR 2024)* .

Fang, S., Cooley, M., Long, D., **Li, S.**, Kirby, M., & Zhe, S. (2024). Solving High Frequency and Multi-Scale PDEs with Gaussian Processes, *In Twelfth International Conference on Learning Representations (ICLR 2024)* .

Wang, Z.*, Fang, S.*, **Li, S.**, & Zhe, S. (2023). Dynamic Tensor Decomposition via Neural Diffusion-Reaction Processes, *Advances in Neural Information Processing Systems (NeurIPS 2023)* . (**Spotlight,Top 10%**)

Fang, S., Yu, X., **Li, S.**, Wang, Z., Kirby R., & Zhe, S. (2023). Streaming Factor Trajectory Learning for Temporal Tensor Decomposition, *Advances in Neural Information Processing Systems (NeurIPS 2023)*. (Acceptance rate: 26.1%)

Li, S.*, Penwarden, M.*, Kirby, R. M., & Zhe, S. (2023 Jun). Meta Learning of Interface Conditions for Multi-Domain Physics-Informed Neural Networks. *In International Conference on Machine*

Learning (ICML 2023) (to appear). PMLR. (Acceptance rate: 27.9%)

Li, S., Wang, Z., Narayan, A., Kirby, R., & Zhe, S. (2023, April). Meta-Learning with Adjoint Methods. In *International Conference on Artificial Intelligence and Statistics (AISTATS 2023)* (pp. 7239-7251). PMLR. (Acceptance rate: 29%)

Li, S., Wang, Z., Kirby, R., & Zhe, S. (2022). Infinite-Fidelity Coregionalization for Physical Simulation. *Advances in Neural Information Processing Systems (NeurIPS 2022)*, 35, 25965-25978. (Acceptance rate: 25.6%)

Li, S.*, Phillips, J. M.*, Yu, X., Kirby, R., & Zhe, S. (2022). Batch Multi-Fidelity Active Learning with Budget Constraints. *Advances in Neural Information Processing Systems (NeurIPS 2022)*, 35, 995-1007. (Acceptance rate: 25.6%)

Li, S., Kirby, R., & Zhe, S. (2022, June). Decomposing Temporal High-Order Interactions via Latent ODEs. In *International Conference on Machine Learning (ICML 2022)* (pp. 12797-12812). PMLR. (Acceptance rate: 21.9%)

Wang, Z., Xu, Y., Tillinghast, C., **Li, S.**, Narayan, A., & Zhe, S. (2022, June). Nonparametric Embeddings of Sparse High-Order Interaction Events. In *International Conference on Machine Learning (ICML 2022)* (pp. 23237-23253). PMLR. (Acceptance rate: 21.9%)

Li, S., Wang, Z., Kirby, R. & Zhe, S.. (2022). Deep Multi-Fidelity Active Learning of High-Dimensional Outputs . Proceedings of The 25th *International Conference on Artificial Intelligence and Statistics (AISTATS 2022)*, Available from https://proceedings.mlr.press/v151/li22b.html. (Acceptance rate: 29.2%)

Li, S., Kirby, R., & Zhe, S. (2021). Batch Multi-Fidelity Bayesian Optimization with Deep Auto-Regressive Networks. *Advances in Neural Information Processing Systems (NeurIPS 2021)*, 34, 25463-25475. (Acceptance rate: 26%)

Li, S., Xing, W., Kirby, R., & Zhe, S. (2020). Multi-fidelity Bayesian optimization via deep neural networks. *Advances in Neural Information Processing Systems (NeurIPS 2020)*, 33, 8521-8531. (Acceptance rate: 20.1%)

Li, S., Xing, W., Kirby, M., & Zhe, S. (2020). Scalable variational gaussian process regression networks. Proceedings of the Twenty-Ninth *International Joint Conference on Artificial Intelligence (IJCAI 2020)* Main track. Pages 2456-2462. https://doi.org/10.24963/ijcai.2020/340 (Acceptance rate: 12.6%)

Yang, T., Fang, S., **Li, S**., Wang, Y., & Ai, Q. (2020, October). Analysis of multivariate scoring functions for automatic unbiased learning to rank. In Proceedings of the 29th ACM *International Conference on Information & Knowledge Management (CIKM 2020)* (pp. 2277-2280). (Acceptance rate: 21.7%)

WORKSHOP PAPERS	**Li, S.**, Shi, L., & Zhe, S. (2023, July) Infinite-Fidelity Surrogate Learning via High-order Gaussian Processes. *1st Synergy of Scientific and Machine Learning Modeling @ ICML 2023*
PAPERS IN SUBMISSION	**Shibo Li**, Xin Yu, Wei Xing, Mike Kirby, Akil Narayan and Shandian Zhe. *Multi-Resolution Active Learning of Fourier Neural Operators.*
	Zheng Wang, **Shibo Li**, Shikai Fang, Shandian Zhe. *Diffusion-Generative Multi-Fidelity Learning for Physical Simulation.*

Shikai Fang, Xin Yu, Zheng Wang, **Shibo Li**, Mike Kirby, Shandian Zhe. *Functional Bayesian Tucker Decomposition for Continuous-indexed Tensor Data.*

Shikai Fang, Madison Cooley, Da Long, **Shibo Li**, Mike Kirby, Shandian Zhee. *Solving High Frequency and Multi-Scale PDEs with Gaussian Processes.*

ACADEMIC SERVICES	**Program Committee**
	AISTATS 2024
	UAI 2023
	AISTATS 2023
	UAI 2022
	AISTATS 2022
	ICMLA 2022

Program Committee
  AISTATS 2024
  UAI 2023
  AISTATS 2023
  UAI 2022
  AISTATS 2022
  ICMLA 2022

Conference Reviewer
  ICML 2024
  ICLR 2024
  NeurIPS 2023
  ICML 2023 Workshop SPIGM
  NeurIPS 2022
  NeurIPS 2022 MetaLearn Workshop
  ICML 2022
  AISTATS 2021
  ICMLA 2021
  UAI 2021
  AAAI 2020

Journal Reviewer
  Journal of Computational Physics
  Scientific Reports

TEACHING

The University of Utah
Teaching Mentorships
- **CS 6350 (Fall 2021)**: Machine Learning
- **CS 6350 (Spring 2021)**: Machine Learning

The University of Georgia
Teaching Assistant, Lab Instructor
- **CSCI 1101 (Fall 2017)**: Introduction to Programming I
- **CSCI 1101 (Spring 2017)**: Introduction to Programming II
- **CSCI 8902 (Fall 2016)**: Decision Making under Uncertainties
- **CSCI 1301(Fall 2015)**: System Programming

APPOINTMENTS

Amazon, Inc., Seattle, WA
Applied Scientist Intern   **May, 2022 - August, 2022**
In-context few-shots learning with large language/multi-modality models.

Amazon, Inc., Seattle, WA
Applied Scientist Intern   **May, 2021 - August, 2021**
Privacy-preserved learning algorithms.

Schlumberger-Doll Research, Cambridge, MA
Robotics Research Intern   **June, 2018 - October, 2018**

Force-controlled planning algorithms.

REFERENCE **Shandian Zhe** (advisor)
   Assistant Professor
   Kahlert School of Computing
   The University of Utah
   Salt Lake City, UT, 84112
   Email: zhe@cs.utah.edu

Mike Kirby
   Professor
   Kahlert School of Computing, Scientific Computing and Imaging Institute
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   Salt Lake City, UT, 84112
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Akil Narayan
   Associate Professor
   Department of Mathematics, Scientific Computing and Imaging Institute
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   Salt Lake City, UT, 84112
   Email: akil@sci.utah.edu

Kang Li
   Professor
   Chief Security Officer @ CertiK
   Franklin College of Arts and Sciences
   The University of Georgia
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Qing Ping
   Senior Applied Scientist
   Amazon, Inc,
   Seattle, WA, 98109
   Email: pingqing@amazon.com