Jiaxin Shi

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Education & Training

2022/7-2023/3 Postdoctoral Scholar, Department of Statistics
Stanford University, CA. Advisor: Emily B. Fox.

2020/8-2022/6 Postdoctoral Researcher
Microsoft Research New England, Cambridge, MA.

2015/9-2020/6 Ph.D., Computer Science & Technology
Tsinghua University, Beijing. Advisor: Jun Zhu.

2011/8-2015/7 B.Eng., Computer Science & Technology
Tsinghua University, Beijing.

Professional Service

Area Chair

Neural Information Processing Systems (NeurIPS) 2023
International Conference on Artificial Intelligence and Statistics (AISTATS) 2023

Senior Program Committee

AAAI Conference on Artificial Intelligence 2022

Program Committee / Reviewer

Journal of Machine Learning Research (JMLR)
Transactions on Machine Learning Research (TMLR)
International Conference on Artificial Intelligence and Statistics (AISTATS) 2021, 2022
International Conference on Learning Representations (ICLR) 2020-2024
Neural Information Processing Systems (NeurIPS) 2019-2022
International Conference on Machine Learning (ICML) 2019, 2021, 2023
Asian Conference on Machine Learning (ACML) 2019, 2020
Symposium on Advances in Approximate Bayesian Inference (AABI) 2021

Organizing Commitee

Workflow Chair. International Conference on Artificial Intelligence and Statistics (AISTATS) 2024

Employment

2023/3- Research Scientist
DeepMind, London, UK.

Oct-Dec 2019 Research Intern
Vector Institute, Toronto, short-term visit hosted by Prof. Roger Grosse.

Jun-Sep 2019 Research Scientist Intern
DeepMind, London, worked with Dr. Andriy Mnih and Dr. Michalis Titsias.

Jul-Sep 2018 Research Intern
RIKEN Center for Advanced Intelligence Project, Tokyo, worked with Dr. Emtiyaz Khan.

Nov-Jul 2015 Intern
Mobvoi Inc., Beijing, worked with Dr. Libin Shen.

Jul-Sep 2014 Undergraduate Research Intern
Carnegie Mellon University, supervised by Prof. Eric Xing on projects of distributed topic models.

Honors & Awards

2022 **NeurIPS 2022 Outstanding Paper Award**.
2022 Top Reviewer, NeurIPS 2022.
2020 Outstanding Thesis Award, Tsinghua University.
2019 **Best Student Paper Runner-Up**, Symposium on Advances in Approximate Bayesian Inference (AABI).
2018 **Microsoft Research PhD Fellowship**, Asia-Pacific Region.
2016 Honorable mention (ranked 1/80), Duke-Tsinghua Machine Learning Summer School.
2015 Excellent Graduate Award, Department of Computer Science & Technology, Tsinghua University.
2014 First prize (8 out of 77), Tsinghua Contribution Award of Laboratory Construction.
2011-2013 Huang-Yicong Couple Scholarship, Tsinghua University.

Publications

(*) denotes equal contribution.

Preprints

Zhijie Deng*, **Jiaxin Shi***, Hao Zhang, Peng Cui, Cewu Lu, and Jun Zhu. Neural eigenfunctions are structured representation learners. arXiv preprint arXiv:2210.12637 (2022).

Refereed Conference Publications

Jiaxin Shi and Lester Mackey. A finite-particle convergence rate for Stein variational gradient descent. To appear in *Advances in Neural Information Processing Systems (NeurIPS)*, 2023.

Jiaxin Shi, Ke Alexander Wang, and Emily B. Fox. Sequence modeling with multiresolution convolutional memory. *International Conference on Machine Learning (ICML)*, 2023.

Jiaxin Shi, Yuhao Zhou, Jessica Hwang, Michalis K Titsias, and Lester Mackey. Gradient estimation with discrete Stein operators. *Advances in Neural Information Processing Systems (NeurIPS)*, 2022. **NeurIPS 2022 Outstanding Paper Award**.

Zhijie Deng, **Jiaxin Shi**, and Jun Zhu. NeuralEF: Deconstructing kernels by deep neural networks. *International Conference on Machine Learning (ICML)*, 2022.

Michalis K. Titsias and **Jiaxin Shi**. Double control variates for gradient estimation in discrete latent variable models. *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2022.

Jiaxin Shi, Chang Liu, and Lester Mackey. Sampling with mirrored Stein operators. *International*

Conference on Learning Representations (ICLR), 2022. **Spotlight Presentation (top 5.2%)**.

Shengyang Sun, **Jiaxin Shi**, Andrew Gordon Wilson, and Roger B Grosse. Scalable variational Gaussian processes via harmonic kernel decomposition. In *International Conference on Machine Learning (ICML)*, pages 9955–9965, 2021.

Yuhao Zhou, **Jiaxin Shi**, and Jun Zhu. Nonparametric score estimators. In *International Conference on Machine Learning (ICML)*, pages 11513–11522, 2020.

Jiaxin Shi, Michalis K. Titsias, and Andriy Mnih. Sparse orthogonal variational inference for Gaussian processes. *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020. **Best Student Paper Runner-Up at AABI 2019**.

Yang Song*, Sahaj Garg*, **Jiaxin Shi**, and Stefano Ermon. Sliced score matching: A scalable approach to density and score estimation. *The 35th Conference on Uncertainty in Artificial Intelligence (UAI)*, 2019. **Oral Presentation (top 8.7%)**.

Jiaxin Shi, Mohammad Emtiyaz Khan, and Jun Zhu. Scalable training of inference networks for Gaussian-process models. In *International Conference on Machine Learning (ICML)*, pages 5758–5768, 2019.

Shengyang Sun*, Guodong Zhang*, **Jiaxin Shi***, and Roger Grosse. Functional variational Bayesian neural networks. In *International Conference on Learning Representations (ICLR)*, 2019.

Yucen Luo, Tian Tian, **Jiaxin Shi**, Jun Zhu, and Bo Zhang. Semi-crowdsourced clustering with deep generative models. In *Advances in Neural Information Processing Systems (NeurIPS)*, pages 3216–3226. 2018.

Jiaxin Shi, Shengyang Sun, and Jun Zhu. A spectral approach to gradient estimation for implicit distributions. *International Conference on Machine Learning (ICML)*, pages 4644–4653, 2018.

Jingwei Zhuo, Chang Liu, **Jiaxin Shi**, Jun Zhu, Ning Chen, and Bo Zhang. Message passing Stein variational gradient descent. In *International Conference on Machine Learning (ICML)*, pages 6013–6022, 2018.

Jiaxin Shi*, Shengyang Sun*, and Jun Zhu. Kernel implicit variational inference. *International Conference on Learning Representations (ICLR)*, 2018.

Workshop Papers

Jiaxin Shi and Lester Mackey. A finite-particle convergence rate for Stein variational gradient descent. In *OPT 2022: Optimization for Machine Learning (NeurIPS 2022 Workshop)*, 2022.

Alex Wang, Matthew E. Levine, **Jiaxin Shi**, and Emily Fox. Learning absorption rates in glucose-insulin dynamics from meal covariates. In *NeurIPS 2022 Workshop on Learning from Time Series for Health*, 2022.

Michalis K. Titsias and **Jiaxin Shi**. Double control variates for gradient estimation in discrete latent variable models. *4th Symposium on Advances in Approximate Bayesian Inference*, 2022.

Jiaxin Shi, Chang Liu, and Lester Mackey. Sampling with mirrored Stein operators. *4th Symposium on Advances in Approximate Bayesian Inference*, 2022.

Shengyang Sun*, **Jiaxin Shi***, and Roger Grosse. Neural networks as inter-domain inducing points. *3rd Symposium on Advances in Approximate Bayesian Inference*, 2020.

Jiaxin Shi, Michalis Titsias, and Andriy Mnih. Sparse orthogonal variational inference for Gaussian processes. *2nd Symposium on Advances in Approximate Bayesian Inference*, Vancouver, 2019.

Yuhao Zhou, **Jiaxin Shi**, and Jun Zhu. Spectral estimators for gradient fields of log-densities. *ICML Workshop on Stein's Method*, Long Beach, CA, 2019.

Shengyang Sun*, Guodong Zhang*, **Jiaxin Shi***, and Roger Grosse. Functional variational Bayesian neural networks. *NeurIPS Bayesian Deep Learning Workshop*, Montréal, 2018.

Yucen Luo, Tian Tian, **Jiaxin Shi**, Jun Zhu, and Bo Zhang. Semi-crowdsourced clustering with deep generative models. *ICML Workshop on Theoretical Foundations and Applications of Deep Generative Models*, Stockholm, 2018.

Jiaxin Shi*, Shengyang Sun*, and Jun Zhu. Implicit variational inference with kernel density ratio fitting. *ICML Workshop on Implicit Models*, Sydney, 2017.

Visualization & Graphics

Mengchen Liu, **Jiaxin Shi**, Kelei Cao, Jun Zhu, and Shixia Liu. Analyzing the training processes of deep generative models. *IEEE Transactions on Visualization and Computer Graphics*, 24(1):77–87, 2018.

Mengchen Liu, **Jiaxin Shi**, Zhen Li, Chongxuan Li, Jun Zhu, and Shixia Liu. Towards better analysis of deep convolutional neural networks. *IEEE Transactions on Visualization and Computer Graphics*, 23(1):91–100, 2017. **Most cited paper of TVCG 2017**.

Fanglue Zhang, Jue Wang, Eli Shechtman, Ziye Zhou, **Jiaxin Shi**, and Shimin Hu. Plenopatch: Patch-based plenoptic image manipulation. *IEEE Transactions on Visualization and Computer Graphics*, 23(5):1561–1573, 2017.

Software

I created and lead the development of **ZhuSuan** (GitHub, Documentation), an open-source differentiable probabilistic programming library based on Tensorflow. The project had **2K stars** on GitHub by Aug 2021.

Jiaxin Shi, Jianfei Chen, Jun Zhu, Shengyang Sun, Yucen Luo, Yihong Gu, and Yuhao Zhou. ZhuSuan: A library for Bayesian deep learning. *arXiv preprint arXiv:1709.05870*, 2017.

Selected Talks

May 2023 **Westlake University & City University of Hong Kong & Peking University**, Deep Learning Theory Seminar Series.

Mar 2023 **University of California, Berkeley**, Biostats Seminar.

Jan 2023 **Beijing Academy of Artificial Intelligence**, Qingyuan Talk.

Dec 2022 **North Carolina State University**, Efficient & Intelligent Computing Lab.

Sep 2022 **SIAM Conference on Mathematics of Data Science** , San Diego, CA.

Apr 2022 **Banff International Research Station**, Advances in Stein's method and its applications in Machine Learning and Optimization, Banff, Alberta.

Feb 2022 **Imperial College London & Oxford**, Centre for Doctoral Training in Statistics & Machine Learning.

Feb 2022 **4th Symposium on Advances in Approximate Bayesian Inference**.
Jan 2022 **Max Planck Institute for Intelligent Systems & Cyber Valley**, Scientific Symposium.
Oct 2021 **University of Edinburgh**, School of Informatics.
Aug 2021 **RIKEN Center for Advanced Intelligence Project** (RIKEN-AIP), Tokyo.
Jan 2020 **Microsoft Research New England**, Cambridge, MA.
Dec 2019 **Vector Institute**, Toronto.
Sep 2019 **DeepMind**, Deep Learning Group Meeting, London.
Sep 2019 **University of Bristol**, School of Mathematics.
Jun 2019 **International Conference on Machine Learning** (ICML), Long Beach, CA.
May 2019 **PaperWeekly local meetup**, Beijing.
Apr 2019 **RealAI Inc.**, Beijing.
Nov 2018 **Nanjing University**, Symposium on Machine Learning and Applications (MLA).
Jul 2018 **International Conference on Machine Learning** (ICML), Stockholm.
Jul 2018 **Renmin University**, International Forum on Statistics, Beijing.
Mar 2018 **GPU Technology Conference**, San Jose, CA.
Jun 2017 **Jiangmen Community**, Beijing.

Teaching

2019-2020 **Instructor of the lectures on probabilistic programming**
70240413: Statistical Machine Learning, Tsinghua University.

Spring 2018 **Invited Lecture**
70240033: Artificial Intelligence, Tsinghua University.

Spring 2018 **Teaching Assistant**
70240413: Statistical Machine Learning, Tsinghua University.

Jul-Aug 2017 **Teaching Assistant**
Duke-Tsinghua Machine Learning Summer School 2017.

Spring 2017 **Teaching Assistant**
70240413: Statistical Machine Learning, Tsinghua University.