Jiaxin Shi

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Current Position

2020- Postdoctoral Researcher
Microsoft Research New England, Cambridge, MA.

Education

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

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

Experience & Internships

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

2020 **Outstanding Thesis Award**
Tsinghua University.

2019 **Best Student Paper Runner-Up Award**
2nd Symposium on Advances in Approximate Bayesian Inference (AABI), Vancouver.

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

Michalis Titsias and **Jiaxin Shi**. Double control variates for gradient estimation in discrete latent variable models. *arXiv preprint arXiv:2111.05300*, 2021. Under review.

Jiaxin Shi, Chang Liu, and Lester Mackey. Sampling with mirrored Stein operators. *arXiv preprint arXiv:2106.12506*, 2021. Under review.

Conference Papers

Shengyang Sun, **Jiaxin Shi**, Andrew Gordon 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.

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.

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 Abstracts

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**, an open-source probabilistic programming library based on Tensorflow. By August 2021, our project has received more than **2k stars** on GitHub.

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.

Github: github.com/thu-ml/zhusuan
Documentation: zhusuan.readthedocs.io

Professional Service

Senior Program Committee

AAAI Conference on Artificial Intelligence 2022

Program Committee / Reviewer

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

Talks

Feb 2022 Centre for Doctoral Training in Statistics and Machine Learning, Imperial College London & Oxford.
Oct 2021 School of Informatics, University of Edinburgh.
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	Deep Learning Group Meeting, DeepMind, London.
Sep 2019	School of Mathematics, University of Bristol.
Jun 2019	International Conference on Machine Learning (ICML), Long Beach, CA.
Apr 2019	RealAI Inc., Beijing.
Nov 2018	Symposium on Machine Learning and Applications (MLA), Nanjing University.
Jul 2018	International Conference on Machine Learning (ICML), Stockholm.
Jul 2018	International Forum on Statistics, Renmin University, Beijing.
Mar 2018	GPU Technology Conference, San Jose, CA.

Teaching

2019-2020	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.