SHAO-QUN ZHANG

. Assistant Professor, Lamda Group, Nanjing University

. **Emails**: zhangsq@lamda.nju.edu.cn, zhangsqhndn@gmail.com

. **HomePage**: http://www.lamda.nju.edu.cn/zhangsq/

. *Updated by April 6, 2024*

BIOGRAPHY

Now, I am an assistant professor in School of Intelligence Science and Technology at Nanjing University (Suzhou Campus), and I am also a member of LAMDA Group.

Before that, I obtained my Ph.D. degree from Department of Computer Science and Technology at Nanjing University in September 2022, where I was supervised by Prof. Zhi-Hua Zhou, in LAMDA Group.

From September 2011 to June 2018, I studied for the B.Sc. and M.Sc. degrees from Sichuan University, majoring in Basic Mathematics and Applied Mathematics.

RESEARCH INTERESTS

My current research interests mainly include *Machine Learning* and *Data Mining*. More specifically, I focus on the

<div align="center">

intelligence-inspired computing algorithm and theory

</div>

involving the topics of neural computation, learning theory, and time series analysis.

PUBLICATIONS & MANUSCRIPTS

* indicates equal contribution; § denotes "I am the corresponding author".

Journals:

- Jin-Hui Wu, **Shao-Qun Zhang**, Yuan Jiang, and Zhi-Hua Zhou. Theoretical Exploration of Flexible Transmitter Model. **IEEE Transactions on Neural Networks and Learning Systems (TNNLS)**, 35(3): 3674-3688. 2024. (CORR arXiv:2111.06027).

- **Shao-Qun Zhang**, Fei Wang, and Feng-Lei Fan. Neural Network Gaussian Processes by Increasing Depth. **IEEE Transactions on Neural Networks and Learning Systems (TNNLS)**, 35(2): 2881-2886. 2022. (CORR arXiv:2108.12862).

- Gao Zhang and **Shao-Qun Zhang**§. Lax Extensions of Conical I-Semifilter Monads. **Axioms**, 12(11):1034. 2023.

- Gao Zhang and **Shao-Qun Zhang**§. On Discrete Presheaf Monads. **Axioms**, 12(6):610. 2023

- **Shao-Qun Zhang**, Zhao-Yu Zhang, Yuan Jiang, and Zhi-Hua Zhou. Time Series Theory and Algorithm of Predictable Learnability Based on Error Truncation Assumption (in Chinese). **Chinese Journal of Computers**, 45(11):2279-2289. 2022.

- **Shao-Qun Zhang**, Wei Gao, and Zhi-Hua Zhou. Towards Understanding Theoretical Advantages of Complex-Reaction Networks. **Neural Networks**, 151:80-93. 2022. (CORR arXiv:2108.06711)

- **Shao-Qun Zhang**, Zhao-Yu Zhang, and Zhi-Hua Zhou. Bifurcation Spiking Neural Network. **Journal of Machine Learning Research (JMLR)**, 22(253):1-21. 2021. (CORR arXiv:1909.08341)

- **Shao-Qun Zhang** and Zhi-Hua Zhou. Flexible Transmitter Network. **Neural Computation (NCJ)**, 33(11):2951-2970. 2021. (CORR: arXiv:2004.03839)

- **Shao-Qun Zhang**. Manifold learning algorithm based on compact set sub-coverage (in Chinese). **Chinese Journal of Computer Science**, 44(Z6):88-91. 2017.

Conferences:

- Xiao-Dong Bi, **Shao-Qun Zhang**[§], and Yuan Jiang. MEPSI: An MDL-based Ensemble Pruning Approach with Structural Information. In: *Proceedings of the 38th AAAI Conference on Artificial Intelligence (AAAI'24)*, pp. 11078-11086. 2024.

- Jin-Hui Wu, **Shao-Qun Zhang**, Yuan Jiang, and Zhi-Hua Zhou. Complex-valued Neurons Can Learn More but Slower than Real-valued Neurons via Gradient Descent. In: *Advances in Neural Information Processing Systems 36 (NeurIPS'23)*, pp. 23714-23747. 2023.

- Qin-Cheng Zheng, Shen-Huan Lve, **Shao-Qun Zhang**, Yuan Jiang, and Zhi-Hua Zhou. On the Consistency Rate of Decision Tree Learning Algorithms. In: *Proceedings of the 26th International Conference on Artificial Intelligence and Statistics* (**AISTATS'23**), pp. 7824–7848. 2023.

- **Shao-Qun Zhang** and Zhi-Hua Zhou. Theoretically Provable Spiking Neural Networks. In: *Advances in Neural Information Processing Systems 35* (**NeurIPS'22**), pp. 19345–19356. 2022.

- Zhao-Yu Zhang, **Shao-Qun Zhang**, Yuan Jiang, and Zhi-Hua Zhou. LIFE:Learning Individual Features for Multivariate Time Series Prediction with Missing Values. In *Proceedings of the 21st International Conference on Data Mining* (**ICDM'21**), pp. 1511-1516. 2021. (CORR: arXiv:2109.14844)

- **Shao-Qun Zhang** and Zhi-Hua Zhou. Harmonic recurrent process for time series forecasting. In *Proceedings of the 24th European Conference on Artificial Intelligence* (**ECAI'20**), pp. 1714-1721. 2020.

- **Shao-Qun Zhang** and Wan-Yun Xie. Nonlinear Dimensionality Reduction via Harmonic Tangent Space and Compactness. In *Proceedings of the 2017's International Conference of Pioneering Computer Scientists, Engineers and Educators* (**ICPCSEE'17**), pp. 520-530. 2017.

Manuscripts:

- **Shao-Qun Zhang**, Zong-Yi Chen*, Yong-Ming Tian*, and Xun Lu*. A Unified Kernel for Neural Network Learning. arXiv:2403.17467. 2024.

- **Shao-Qun Zhang**, Jin-Hui Wu, Gao Zhang, Huan Xiong, Bin Gu, and Zhi-Hua Zhou. On the Generalization of Spiking Neural Networks via Minimum Description Length and Structural Stability. arXiv:2207.04876. 2023.

- Gao Zhang, Jin-Hui Wu, and **Shao-Qun Zhang**[§]. On the Approximation and Complexity of Deep Neural Networks to Invariant Functions. arXiv:2210.15279. 2022.

- **Shao-Qun Zhang** and Zhi-Hua Zhou. ARISE: ApeRIodic SEmi-parametric Process for Efficient Markets without Periodogram and Gaussianity Assumptions. arXiv:2111.06222. 2021.

PROFESSIONAL SERVICES

Conference Area Chair:
NeurIPS 2024

Conference SPCs:
AAAI 2021, IJCAI 2019

Conference Reviewers:
AAAI 2019-2024,
AISTATS 2022-2024,
ECAI 2020-2024 (per two years),
ICLR 2021-2024,
ICML 2019-2024,
IJCAI 2019-2024,
NeurIPS 2019-2024,
PAKDD 2022,
UAI 2022-2024

Journal Reviewers:
   Artificial Intelligence (AIJ),
   Chinese Journal of Electronics (CJE),
   Fundamental Research,
   Nature (NATURE),
   Machine Learning (MLJ),
   Scientific Reports,
   ACM Transactions on Knowledge Discovery from Data (TKDD),
   IEEE Transactions on Neural Networks and Learning Systems (TNNLS),
   IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI),
   World Journal of Surgical Oncology (WJSO)

Organizing Committee Member:
   for the 20th Chinese Workshop on Machine Learning and Applications (MLA'2022)

ACADEMIC TALKS

- Give a talk about "On the Expressivity of Spiking Neural Networks via Description Languages" in The Chinese University of Hong Kong (CUHK) at August, 2023.

- On November 19th, 2022, I had a spotlight talk with the topic of "Bifurcation Spiking Neural Network" in Jiangsu Artificial Intelligence Academic Conference.

- On March 31st and April 1st, 2022, I had a talk with the topic of "Introduction: Theoretical Understanding of Deep Neural Networks" at Tianyuan Mathematical Center in Southwest China.

- On November 17th, 2021, I had a talk with the topic of "Investigation of long-term memory without Periodogram and Gaussianity" at Artificial Intelligence Laboratory, Harbin Institute of Technology.

WEBSITES & SOCIAL LINKS

HomePage: http://www.lamda.nju.edu.cn/zhangsq/
Google Scholar: https://scholar.google.com/citations?user=TCh08AUAAAAJ
DBLP: https://dblp.org/pid/249/2560.html
ORCID: https://orcid.org/0000-0002-0614-8984
OpenReview: https://openreview.net/profile?id= Shao-Qun_Zhang1