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**EDUCATION\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Institute of Automation, Chinese Academy of Sciences** Beijing, China

Ph. D. in Computer Science *September 2021 – June 2026 (expected)*

**University of Cambridge** Cambridge, UK

Visiting Student (Artificial Intelligence) April *2025 – April 2026*

**Sun Yat-sen University** Guangzhou, China

B. Eng. in Communication Engineering *September 2017 –* *June 2021*

**RESEARCH INTERESTS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

I am passionate about biologically inspired neural networks, machine learning, and their applications in cognitive science and artificial intelligence. My research focuses on integrating brain-inspired models with advanced AI systems, while enhancing the safety, interpretability, and robustness of large models to address complex real-world challenges.

**PUBLICATIONS\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Papers**

1. **Shen, Guobin**, Zhao, Dongcheng, Dong, Yiting, and Zeng, Yi. “Brain-Inspired Neural Circuit Evolution for Spiking Neural Networks.” *Proceedings of the National Academy of Sciences*, vol. 120, no. 39, 2023, p. e2218173120. National Academy of Sciences. 📃[[PDF]](https://www.pnas.org/doi/epub/10.1073/pnas.2218173120)
2. **Shen, Guobin**, Zhao, Dongcheng, Dong, Yiting, He, Xiang, and Zeng, Yi. “Jailbreak Antidote: Runtime Safety-Utility Balance via Sparse Representation Adjustment in Large Language Models.” *Proceedings of the 13th International Conference on Learning Representations (ICLR 2025)*, 2025. 🔗[[OpenReview]](https://openreview.net/forum?id=s20W12XTF8) 📃[[PDF]](https://arxiv.org/pdf/2410.02298)
3. **Shen, Guobin**, Zhao, Dongcheng, Li, Tenglong, Li, Jindong, and Zeng, Yi. “Are Conventional SNNs Really Efficient? A Perspective from Network Quantization.” *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 2024, pp. 27538-27547. 📃[[PDF]](https://openaccess.thecvf.com/content/CVPR2024/papers/Shen_Are_Conventional_SNNs_Really_Efficient_A_Perspective_from_Network_Quantization_CVPR_2024_paper.pdf) 🔗[[Poster]](https://cvpr.thecvf.com/virtual/2024/poster/29731)
4. **Shen, Guobin**, Zhao, Dongcheng, He, Xiang, Feng, Linghao, Dong, Yiting, Wang, Jihang, Zhang, Qian, and Zeng, Yi. “Neuro-Vision to Language: Image Reconstruction and Interaction via Non-invasive Brain Recordings.” *Proceedings of the 38th Conference on Neural Information Processing Systems (NeurIPS 2024)*, 2024. 📃[[PDF]](https://proceedings.neurips.cc/paper_files/paper/2024/file/b1c62bdeee97b38c34dcda152c829511-Paper-Conference.pdf) 🔗[[Poster]](https://neurips.cc/virtual/2024/poster/93607)
5. **Shen, Guobin**, Zhao, Dongcheng, Bao, Aorigele, He, Xiang, Dong, Yiting, and Zeng, Yi. “StressPrompt: Does Stress Impact Large Language Models and Human Performance Similarly?” *Proceedings of the 39th AAAI Conference on Artificial Intelligence (AAAI 2025)*, 2025. 🔗[[OpenReview]](https://openreview.net/forum?id=vbasQ4Kr6k) 📃[[PDF]](https://arxiv.org/pdf/2409.17167)
6. **Shen, Guobin**, Zhao, Dongcheng, and Zeng, Yi. “Backpropagation with Biologically Plausible Spatiotemporal Adjustment for Training Deep Spiking Neural Networks.” *Patterns*, vol. 3, no. 6, 2022. Elsevier. 📃[[PDF]](https://floyedshen.github.io/pdf/shen2022back.pdf)
7. **Shen, Guobin**, Zhao, Dongcheng, and Zeng, Yi. “Exploiting Nonlinear Dendritic Adaptive Computation in Training Deep Spiking Neural Networks.” *Neural Networks*, vol. 170, 2024, pp. 190-201. Pergamon. 📃[[PDF]](https://floyedshen.github.io/pdf/shen2024nonlinear.pdf)
8. **Shen, Guobin**, Zhao, Dongcheng, and Zeng, Yi. “EventMix: An Efficient Data Augmentation Strategy for Event-Based Learning.” *Information Sciences*, vol. 644, 2023, p. 119170. Elsevier. 📃[[PDF]](https://floyedshen.github.io/pdf/shen2023eventmix.pdf)
9. **Shen, Guobin**, Zhao, Dongcheng, and Zeng, Yi. “Exploiting High-Performance Spiking Neural Networks with Efficient Spiking Patterns.” *IEEE Transactions on Emerging Topics in Computational Intelligence (TETCI)*, 2025.
10. **Shen, Guobin**, Zhao, Dongcheng, Shen, Sicheng, and Zeng, Yi. “Enhancing Spiking Transformers with Binary Attention Mechanisms.” *The Second Tiny Papers Track at ICLR 2024*. 📃[[PDF]](https://openreview.net/pdf?id=6X3TNqLb5t)
11. Zhao, Dongcheng, **Shen, Guobin**, Dong, Yiting, Li, Yang, and Zeng, Yi. “Improving Stability and Performance of Spiking Neural Networks through Enhancing Temporal Consistency.” *Pattern Recognition*, vol. 159, 2025, p. 111094. Pergamon. 🔗[[Arxiv]](https://arxiv.org/abs/2305.14174) 📃[[PDF]](https://floyedshen.github.io/pdf/zhao2025improving.pdf)
12. Han, Bing, Zhao, Feifei, Zeng, Yi, and **Guobin Shen**. “Developmental Plasticity-Inspired Adaptive Pruning for Deep Spiking and Artificial Neural Networks.” *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2024. IEEE. 📃[[PDF]](https://floyedshen.github.io/pdf/han2024developmental.pdf)
13. Pan, Wenxuan, Zhao, Feifei, **Shen, Guobin**, Han, Bing, and Zeng, Yi. “Brain-Inspired Multi-Scale Evolutionary Neural Architecture Search for Deep Spiking Neural Networks.” *IEEE Transactions on Evolutionary Computation*, 2024. IEEE.
14. Li, Jindong, **Shen, Guobin**, Zhao, Dongcheng, Zhang, Qian, and Zeng, Yi. “Firefly v2: Advancing Hardware Support for High-Performance Spiking Neural Network with a Spatiotemporal FPGA Accelerator.” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 2024. IEEE. 📃[[PDF]](https://floyedshen.github.io/pdf/li2024fireflyv2.pdf)
15. Li, Jindong, Li, Tenglong, **Shen, Guobin**, Zhao, Dongcheng, Zhang, Qian, and Zeng, Yi. “Revealing Untapped DSP Optimization Potentials for FPGA-Based Systolic Matrix Engines.” *2024 34th International Conference on Field-Programmable Logic and Applications (FPL)*, IEEE, 2024, pp. 197-203. 🔗[[Arxiv]](https://arxiv.org/abs/2409.03508) 📃[[PDF]](https://floyedshen.github.io/pdf/li2024revealing.pdf)
16. Li, Tenglong, Li, Jindong, **Shen, Guobin**, Zhao, Dongcheng, Zhang, Qian, and Zeng, Yi. “FireFly-S: Exploiting Dual-Side Sparsity for Spiking Neural Networks Acceleration with Reconfigurable Spatial Architecture.” *IEEE Transactions on Circuits and Systems I: Regular Papers*, 2024. IEEE. 📃[[PDF]](https://floyedshen.github.io/pdf/li2024fireflys.pdf)
17. Li, Jindong, **Shen, Guobin**, Zhao, Dongcheng, Zhang, Qian, and Zeng, Yi. “Firefly: A High-Throughput Hardware Accelerator for Spiking Neural Networks with Efficient DSP and Memory Optimization.” *IEEE Transactions on Very Large Scale Integration (VLSI) Systems*, vol. 31, no. 8, 2023, pp. 1178-1191. IEEE. 📃[[PDF]](https://floyedshen.github.io/pdf/li2023firefly.pdf)
18. Shen, Sicheng, Zhao, Dongcheng, **Shen, Guobin**, and Zeng, Yi. “TIM: An Efficient Temporal Interaction Module for Spiking Transformer.” *Proceedings of the 33rd International Joint Conference on Artificial Intelligence (IJCAI 2024)*, 2024. 📃[[PDF]](https://www.ijcai.org/proceedings/2024/0347.pdf)
19. Dong, Yiting, He, Xiang, **Shen, Guobin**, Zhao, Dongcheng, Li, Yang, and Zeng, Yi. “EventZoom: A Progressive Approach to Event-Based Data Augmentation for Enhanced Neuromorphic Vision.” *Proceedings of the 39th AAAI Conference on Artificial Intelligence (AAAI 2025)*, 2025. 🔗[[OpenReview]](https://openreview.net/forum?id=pCNJkhoskj)
20. Dong, Yiting, Li, Yang, Zhao, Dongcheng, **Shen, Guobin**, and Zeng, Yi. “Bullying10K: A Large-Scale Neuromorphic Dataset Towards Privacy-Preserving Bullying Recognition.” *Advances in Neural Information Processing Systems*, vol. 36, 2024. 📃[[PDF]](https://proceedings.neurips.cc/paper_files/paper/2023/file/05ffe69463062b7f9fb506c8351ffdd7-Paper-Datasets_and_Benchmarks.pdf) 🔗[[Poster]](https://neurips.cc/virtual/2023/poster/73636)
21. He, Xiang, Liu, Xiangxi, Li, Yang, Zhao, Dongcheng, **Shen, Guobin**, Kong, Qingqun, Yang, Xin, and Zeng, Yi. “CACE-Net: Co-guidance Attention and Contrastive Enhancement for Effective Audio-Visual Event Localization.” *Proceedings of the 32nd ACM International Conference on Multimedia*, 2024, pp. 985-993. 🔗[[OpenReview]](https://openreview.net/forum?id=ue6UUvoL8B) 📃[[PDF]](https://dl.acm.org/doi/pdf/10.1145/3664647.3681503)
22. He, Xiang, Zhao, Dongcheng, Li, Yang, **Shen, Guobin**, Kong, Qingqun, and Zeng, Yi. “An Efficient Knowledge Transfer Strategy for Spiking Neural Networks from Static to Event Domain.” *Proceedings of the AAAI Conference on Artificial Intelligence*, vol. 38, no. 1, 2024, pp. 512-520. 🔗[[Arxiv]](https://arxiv.org/abs/2303.13077)
23. Han, Bing, Zhao, Feifei, Zeng, Yi, Pan, Wenxuan, and **Shen, Guobin**. “Enhancing Efficient Continual Learning with Dynamic Structure Development of Spiking Neural Networks.” *Proceedings of the 32nd International Joint Conference on Artificial Intelligence (IJCAI 2023)*, 2023. 📃[[PDF]](https://www.ijcai.org/proceedings/2023/0334.pdf)
24. Zeng, Yi, Zhao, Dongcheng, Zhao, Feifei, **Shen, Guobin**, Dong, Yiting, Lu, Enmeng, Zhang, Qian, Sun, Yinqian, Liang, Qian, Zhao, Yuxuan, and others. “BrainCog: A Spiking Neural Network Based, Brain-Inspired Cognitive Intelligence Engine for Brain-Inspired AI and Brain Simulation.” *Patterns*, 2023, p. 100789. 📃[[PDF]](https://floyedshen.github.io/pdf/zeng2023braincog.pdf)

**Preprint**

1. **Shen, Guobin**, Li, Jindong, Li, Tenglong, Zhao, Dongcheng, and Zeng, Yi. “*SpikePack*: Enhanced Information Flow in Spiking Neural Networks with High Hardware Compatibility.” *arXiv preprint arXiv:2501.14484*, 2025. 🔗[[Arxiv]](https://arxiv.org/abs/2501.14484)
2. Dong, Yiting, **Shen, Guobin**, Zhao, Dongcheng, He, Xiang, and Zeng, Yi. “Harnessing Task Overload for Scalable Jailbreak Attacks on Large Language Models.” *arXiv preprint arXiv:2410.04190*, 2024. 🔗[[Arxiv]](https://arxiv.org/abs/2410.04190)
3. Yu, Yonghao, Zhao, Dongcheng, **Shen, Guobin**, Dong, Yiting, and Zeng, Yi. “Brain-Inspired Stepwise Patch Merging for Vision Transformers.” *arXiv preprint arXiv:2409.06963*, 2024. 🔗[[Arxiv]](https://arxiv.org/abs/2409.06963)
4. Feng, Linghao, Zhao, Dongcheng, Shen, Sicheng, Dong, Yiting, **Shen, Guobin**, and Zeng, Yi. “Time Cell Inspired Temporal Codebook in Spiking Neural Networks for Enhanced Image Generation.” *arXiv preprint arXiv:2405.14474*, 2024. 🔗[[Arxiv]](https://arxiv.org/abs/2405.14474)
5. **Shen, Guobin**, Zhao, Dongcheng, Dong, Yiting, Li, Yang, and Zeng, Yi. “Dive into the Power of Neuronal Heterogeneity.” *arXiv preprint arXiv:2305.11484*, 2023. 🔗[[Arxiv]](https://arxiv.org/abs/2305.11484)
6. **Shen, Guobin**, Zhao, Dongcheng, Dong, Yiting, Li, Yang, Zhao, Feifei, and Zeng, Yi. “Learning the Plasticity: Plasticity-Driven Learning Framework in Spiking Neural Networks.” *arXiv preprint arXiv:2308.12063*, 2023. 🔗[[Arxiv]](https://arxiv.org/abs/2308.12063)
7. **Shen, Guobin**, Zhao, Dongcheng, Dong, Yiting, Li, Yang, Li, Jindong, Sun, Kang, and Zeng, Yi. “Astrocyte-Enabled Advancements in Spiking Neural Networks for Large Language Modeling.” *arXiv preprint arXiv:2312.07625*, 2023. 🔗[[Arxiv]](https://arxiv.org/abs/2312.07625)
8. He, Xiang, Zhao, Dongcheng, Li, Yang, **Shen, Guobin**, Kong, Qingqun, and Zeng, Yi. “Improving the Performance of Spiking Neural Networks on Event-Based Datasets with Knowledge Transfer.” *arXiv preprint arXiv:2303.13077*, 2023. 🔗[[Arxiv]](https://arxiv.org/abs/2305.14174)
9. Wang, Jihang, Zhao, Dongcheng, **Shen, Guobin**, Zhang, Qian, and Zeng, Yi. “DPSNN: A Differentially Private Spiking Neural Network with Temporal Enhanced Pooling.” *arXiv preprint arXiv:2205.12718*, 2022. 🔗[[Arxiv]](https://arxiv.org/abs/2205.12718)

**AWARDS AND HONORS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* **National Scholarship (Undergraduate) (2019, 2020)**
  + Awarded by the Chinese Government for outstanding performance in academics, extracurriculars, and leadership (top 1%).
* **National Scholarship (Doctoral Student) (2024)**
  + Granted for exceptional research contributions and academic excellence (top 1%).
* **National Second Prize, National Undergraduate Electronic Design Competition (2019)**
  + Recognized for excellence in electronic design among national competitors.
* **Runner-Up, International Aerial Robotics Competition (Asia-Pacific Region) (2019)**
  + Achieved second place in an international robotics competition, showcasing innovation in aerial robotics.