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PARTICULARS

Education

Institute of Automation, Chinese Academy of Sciences — Beijing, China
Ph. D. in Computer Science — *September 2021 – Now*

Sun Yat-sen University — Guangzhou, China
B. Eng. in in Communication Engineering — *September 2017 – June 2021*

RESEARCH INTERESTS

I am interested in biologically inspired neural models, and spiking neural networks, particularly their applications in cognitive science and artificial intelligence. My work also focuses on integrating brain-inspired approaches with large-scale AI systems, as well as addressing the safety and interpretability challenges of these models.

PUBLICATIONS

Preprint

1. **Shen, G.**, Zhao, D., Dong, Y., He, X., & Zeng, Y. (2024). Jailbreak Antidote: Runtime Safety-Utility Balance via Sparse Representation Adjustment in Large Language Models. *arXiv preprint arXiv:2410.02298.*

2. **Shen, G.**, Zhao, D., Bao, A., He, X., Dong, Y., & Zeng, Y. (2024). StressPrompt: Does Stress Impact Large Language Models and Human Performance Similarly? *arXiv preprint arXiv:2409.17167.*

3. **Shen, G.**, Zhao, D., Dong, Y., Li, Y., Li, J., Sun, K., & Zeng, Y. (2023). Astrocyte-Enabled Advancements in Spiking Neural Networks for Large Language Modeling. *arXiv preprint arXiv:2312.07625.*

4. **Shen, G.**, Zhao, D., Dong, Y., Li, Y., Zhao, F., & Zeng, Y. (2023). Metaplasticity: Unifying Learning and Homeostatic Plasticity in Spiking Neural Networks. *arXiv preprint arXiv:2308.12063.*

5. **Shen, G.**, Zhao, D., Dong, Y., Li, Y., & Zeng, Y. (2023). Dive into the power of neuronal heterogeneity. *arXiv preprint arXiv:2305.11484.*

6. **Shen, G.**, Zhao, D., & Zeng, Y. (2023). Exploiting high performance spiking neural networks with efficient spiking patterns. *arXiv preprint arXiv:2301.12356.*

PAPERS

1. **Shen, G.**, Zhao, D., Dong, Y., & Zeng, Y. (2023). Brain-inspired neural circuit evolution for spiking neural networks. *Proceedings of the National Academy of Sciences, 120(39), e2218173120. National Acad Sciences.*

2. **Shen, G**., Zhao, D., He, X., Feng, L., Dong, Y., Wang, J., Zhang, Q., & Zeng, Y. (2024). Neuro-Vision to Language: Image Reconstruction and Interaction via Non-invasive Brain Recordings. *Advances in Neural Information Processing Systems.*

3. **Shen, G.**, Zhao, D., Li, T., Li, J., & Zeng, Y. (2024). Are Conventional SNNs Really Efficient? A Perspective from Network Quantization. *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (pp. 27538–27547).*

4. **Shen, G.**, Zhao, D., Shen, S., & Zeng, Y. (2024). Exploiting nonlinear dendritic adaptive computation in training deep Spiking Neural Networks. *Neural Networks, 170, 190–201. Elsevier.*

5. **Shen, G.**, Zhao, D., & Zeng, Y. (2022). Backpropagation with biologically plausible spatiotemporal adjustment for training deep spiking neural networks. *Patterns, 3(6). Elsevier.*

6. **Shen, G.**, Zhao, D., & Zeng, Y. (2023). Eventmix: An efficient data augmentation strategy for event-based learning. *Information Sciences, 644, 119170. Elsevier.*

7. **Shen, G.**, Zhao, D., Shen, S., & Zeng, Y. (2024). Enhancing Spiking Transformers with Binary Attention Mechanisms. *In The Second Tiny Papers Track at ICLR 2024.*

8. Li, J., **Shen, G.**, Zhao, D., Zhang, Q., & Zeng, Y. (2024). 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. IEEE.*

9. Li, J., **Shen, G.**, Zhao, D., Zhang, Q., & Zeng, Y. (2023). 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, 31(8), 1178–1191. IEEE.*

10. Li, J., Li, T., **Shen, G.**, Zhao, D., Zhang, Q., & Zeng, Y. (2024). Revealing Untapped DSP Optimization Potentials for FPGA-Based Systolic Matrix Engines. *In 2024 34th International Conference on Field-Programmable Logic and Applications (FPL) (pp. 197–203). IEEE.*

11. Pan, W., Zhao, F., **Shen, G.**, & Zeng, Y. (2024). Multi-scale Evolutionary Neural Architecture Search for Deep Spiking Neural Networks. *IEEE Transactions on Evolutionary Computation.*

12. Zhao, D., **Shen, G.**, Dong, Y., Li, Y., & Zeng, Y. (2024). Improving stability and performance of spiking neural networks through enhancing temporal consistency. *Pattern Recognition, 111094. Elsevier.*

13. Han, B., Zhao, F., Zeng, Y., & **Shen, G.** (2024). Developmental plasticity-inspired adaptive pruning for deep spiking and artificial neural networks. *IEEE Transactions on Pattern Analysis and Machine Intelligence. IEEE.*

14. Dong, Y., Li, Y., Zhao, D., **Shen, G.**, & Zeng, Y. (2024). Bullying10K: A large-scale neuromorphic dataset towards privacy-preserving bullying recognition. *Advances in Neural Information Processing Systems, 36.*

15. He, X., Zhao, D., Li, Y., **Shen, G.**, Kong, Q., & Zeng, Y. (2024). An Efficient Knowledge Transfer Strategy for Spiking Neural Networks from Static to Event Domain. *In Proceedings of the AAAI Conference on Artificial Intelligence (Vol. 38, No. 1, pp. 512–520).*

16. He, X., Liu, X., Li, Y., Zhao, D., Shen, G., Kong, Q., Yang, X., & Zeng, Y. (2024). CACE-Net: Co-guidance Attention and Contrastive Enhancement for Effective Audio-Visual Event Localization. *In Proceedings of the 32nd ACM International Conference on Multimedia (pp. 985–993).*

17. Zhang, J., Hu, H., & **Shen, G.** (2020). Joint stacked hourglass network and salient region attention refinement for robust face alignment. *ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM, 16(1), 1–18). ACM New York, NY, USA.*

18. Zeng, Y., Zhao, D., Zhao, F., **Shen, G.**, Dong, Y., Lu, E., Zhang, Q., Sun, Y., Liang, Q., Zhao, Y., & others. (2023). Braincog: A spiking neural network based, brain-inspired cognitive intelligence engine for brain-inspired AI and brain simulation. *Patterns, 4(8). Elsevier.*