

Figure R1. Temporal heterogeneity visualization.

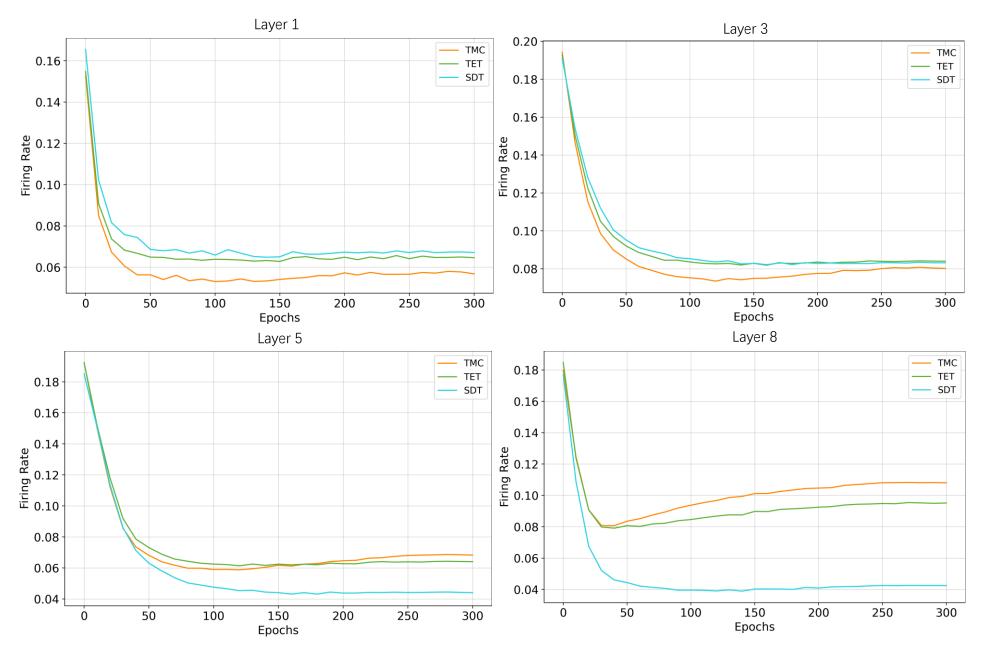


Figure R2. Spike firing rates comparison across layers during training.

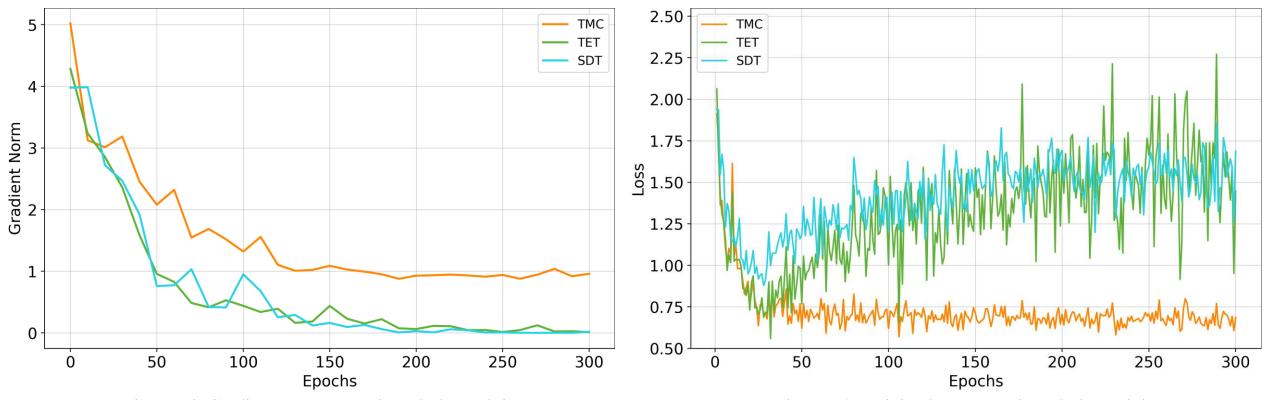


Figure R3. Gradient norm comparison during training.

Figure R4. Training loss comparison during training.

Table R1. Performance comparison with state-of-the-art methods on DVS-Gesture.

	1		
Model	Architecture	Time Step	Accuracy
STBP-tdBN [R2]	ResNet-17	40	96.87
PLIF [R3]	5Conc, 2FC	20	97.57
SEW ResNet [R4]	7B-Net	16	97.92
TA-SNN [R5]	TA-SNN	20	98.61
TCJA [R6]	5Conc, 2FC	20	99.00
STSC [R7]	5Conc, 2FC	20	98.96
SLT-TET [R8]	VGGSNN	10	98.43
Spikeformer [R9]	Spikeformer-7/5 \times 1 \times 3	16	98.96
TMC	VGGSNN	10	99.12%

[R2] Zheng, H., Wu, Y., Deng, L., Hu, Y., and Li, G. (2021). Going deeper with directly-trained larger spiking neural networks. Proc. AAAI Conf. Artif. Intell. 35, 11062–11070. doi: 10.48550/arXiv.2011.05280.

[R3] Fang, W., Yu, Z., Chen, Y., Masquelier, T., Huang, T., and Tian, Y. (2021c). "Incorporating learnable membrane time constant to enhance learning of spiking neural networks," in Proceedings of the IEEE/CVF International Conference on Computer Vision, 2661–2671.

[R4] Fang, W., Yu, Z., Chen, Y., Huang, T., Masquelier, T., and Tian, Y. (2021b). Deep residual learning in spiking neural networks. Adv. Neural Inform. Process. Syst. 34, 21056–21069. Available online at: https://proceedings.neurips.cc/paper/ 2021/hash/afe434653a898da20044041262b3ac74-Abstract.html.

[R5] Yao, M., Gao, H., Zhao, G., Wang, D., Lin, Y., Yang, Z., et al. (2021). "Temporal-wise attention spiking neural networks for event streams classification," in Proceedings of the IEEE/CVF International Conference on Computer Vision, 10221–10230.

[R6] 35, 11062–11070. doi: 10.48550/arXiv.2011.05280 Zhu,R.-J., Zhao, Q., Zhang,T., Deng,H.,Duan,Y.,Zhang,M.,etal.(2022).Tcja snn: Temporal-channel joint attention for spiking neural networks. arXiv 2022, 10177. doi: 10.48550/arXiv.2206.10177.

[R7] Yu, C., Gu, Z., Li, D., Wang, G., Wang, A., and Li, E. Stsc-snn: Spatio-temporal synaptic connection with temporalconvolution and attention for spiking neural networks. Frontiers in Neuroscience, 16:1079357, 2022.

[R8] Anumasa, S., Mukhoty, B., Bojkovic, V., De Masi, G.,Xiong, H., and Gu, B. Enhancing training of spikingneural network with stochastic latency. In Proceedingsof the AAAI Conference on Artificial Intelligence, vol-ume 38, pp. 10900–10908, 2024.

[R9] Li, Y., Lei, Y., and Yang, X. Spikeformer: Training high-performance spiking neural network with transformer. Neurocomputing, 574:127279, 2024b.