Haim Sompolinsky

Publication List

June 2026

1. Froudarakis, E., Cohen, U., Diamantaki, M., Patel, S., Tan, Z., Muhammad, T., Walker, E.Y., Reimer, J., Berens, P., Sompolinsky, H., & Tolias, A.S. (2026). Object manifold geometry across the mouse cortical visual hierarchy. *eLife*, 15, RP110287.
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4. Shan, H., Li, Q., & Sompolinsky, H. (2026). Order parameters and phase transitions of continual learning in deep neural networks. *Proceedings of the National Academy of Sciences*, 123 (6), e2501899123.
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6. Pan, X., Hahami, E., Fan, J., Xie, Z., & Sompolinsky, H. (2025). Closing the Data-Efficiency Gap Between Autoregressive and Masked Diffusion LLMs. *arXiv preprint* arXiv:2510.09885.
7. Pan, X., Hahami, E., Zhang, Z., & Sompolinsky, H. (2025). Memorization and Knowledge Injection in Gated LLMs. *arXiv preprint* arXiv:2504.21239.
8. Overwiening, J., Kumar, M.G., & Sompolinsky, H. (2025). TeDFA-δ: Temporal integration in deep spiking networks trained with feedback alignment improves policy learning. *8th Annual Conference on Cognitive Computational Neuroscience (CCN)*.
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14. Schrage, L., Irie, K., & Sompolinsky, H. (2024). Neural Representational Geometry of Concepts in Large Language Models. *NeurIPS 2024 Workshop on Symmetry and Geometry in Neural Representations*.
15. Wang, B., Shang, J., & Sompolinsky, H. (2024). Diverse capability and scaling of diffusion and auto-regressive models when learning abstract rules. *arXiv preprint* arXiv:2411.07873.
16. Behrens, F., Mainali, N., Marullo, C., Lee, S., Sorscher, B., & Sompolinsky, H. (2024). Statistical mechanics of deep learning**.** *Journal of Statistical Mechanics: Theory and Experiment, 2024 (10), 104007*.

17. H. Sompolinsky (2024). Deciphering the mysteries of the neural code, Danish Medical Journal 71 (6), A300006-A300006.
18. Tiberi, L., Mignacco, F., Irie, K & ,.Sompolinsky, H. (2024) Dissecting the Interplay of Attention Paths in a Statistical Mechanics Theory of Transformers.*Proceedings of Neural Information Processing Systems*.
19. Kuoch, M., Chou, C.N., Parthasarathy ,N., Dapello, J., DiCarlo, J.J., Sompolinsky, H. and Chung, S. (2024). Probing Biological and Artificial Neural Networks with Task-dependent Neural Manifolds. In *Conference on Parsimony and Learning*) pp. 395-418).
20. Li, Q., Sorscher, B., & Sompolinsky, H. (2024). Representations and generalization in artificial and brain neural networks**.** *Proceedings of the National Academy of Sciences, 121* (27), e2311805121.Haozhe Shan, Ludovica Bachschmid-Romano, and Haim Sompolinsky (2024). "Error-correcting columnar networks: high-capacity memory under sparse connectivity." In *Associative Memory and Hopfield Networks (NeurIPS, 2024)*
21. Rubin, Ran, and Haim Sompolinsky (2023). Temporal support vectors for spiking neuronal networks. *arXiv preprint arXiv:2205.14544*.
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23. Brunel, N., Monasson, R., Sompolinsky, H., & van Hemmen, J.L. (2023). From the Statistical Physics of Disordered Systems to Neuroscience. In *Spin Glass Theory and Far Beyond: Replica Symmetry Breaking After 40 Years …*
24. Furstenberg, Ariel, Haim Sompolinsky, and Leon Y. Deouell (2023). Error monitoring when no errors are possible: Arbitrary free-choice decisions invoke error monitoring processes. iScience 26.4.
25. Shan, Haozhe, and Haim Sompolinsky (2022). A minimum perturbation theory of deep perceptual learning. Physical Review E 106.6: 064406
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