Surya Ganguli

List of Publications by Year
in descending order

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56 papers	5,543 citations	136950 32 h-index	175258 52 g-index
78 all docs	78 docs citations	78 times ranked	5546 citing authors

#	Article	IF	Citations
1	A deep learning framework for neuroscience. Nature Neuroscience, 2019, 22, 1761-1770.	14.8	563
2	Cortical layerâ€“specific critical dynamics triggering perception. Science, 2019, 365, .	12.6	447
3	On simplicity and complexity in the brave new world of large-scale neuroscience. Current Opinion in Neurobiology, 2015, 32, 148-155.	4.2	320
4	SuperSpike: Supervised Learning in Multilayer Spiking Neural Networks. Neural Computation, 2018, 30, 1514-1541.	2.2	307
5	A Multiplexed, Heterogeneous, and Adaptive Code for Navigation in Medial Entorhinal Cortex. Neuron, 2017, 94, 375-387.e7.	8.1	233
6	Memory traces in dynamical systems. Proceedings of the National Academy of Sciences of the United States of America, 2008, 105, 18970-18975.	7.1	217
7	Environmental Boundaries as an Error Correction Mechanism for Grid Cells. Neuron, 2015, 86, 827-839.	8.1	211
8	Compressed Sensing, Sparsity, and Dimensionality in Neuronal Information Processing and Data Analysis. Annual Review of Neuroscience, 2012, 35, 485-508.	10.7	201
9	Accurate Estimation of Neural Population Dynamics without Spike Sorting. Neuron, 2019, 103, 292-308.e4.	8.1	195
10	Unsupervised Discovery of Demixed, Low-Dimensional Neural Dynamics across Multiple Timescales through Tensor Component Analysis. Neuron, 2018, 98, 1099-1115.e8.	8.1	193
11	Fundamental bounds on the fidelity of sensory cortical coding. Nature, 2020, 580, 100-105.	27.8	146
12	Principles governing the integration of landmark and self-motion cues in entorhinal cortical codes for navigation. Nature Neuroscience, 2018, 21, 1096-1106.	14.8	143
13	The temporal paradox of Hebbian learning and homeostatic plasticity. Current Opinion in Neurobiology, 2017, 43, 166-176.	4.2	138
14	Shared Cortex-Cerebellum Dynamics in the Execution and Learning of a Motor Task. Cell, 2019, 177, 669-682.e24.	28.9	130
15	One-Dimensional Dynamics of Attention and Decision Making in LIP. Neuron, 2008, 58, 15-25.	8.1	126
16	Social Control of Hypothalamus-Mediated Male Aggression. Neuron, 2017, 95, 955-970.e4.	8.1	117
17	Statistical Mechanics of Deep Learning. Annual Review of Condensed Matter Physics, 2020, 11, 501-528.	14.5	117
18	Holographic protection of chronology in universes of the GÃ¶del type. Physical Review D, 2003, 67, .	4.7	114

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19	Spatial Information Outflow from the Hippocampal Circuit: Distributed Spatial Coding and Phase Precession in the Subiculum. Journal of Neuroscience, 2012, 32, 11539-11558.	3.6	90
20	A mathematical theory of semantic development in deep neural networks. Proceedings of the National Academy of Sciences of the United States of America, 2019, 116, 11537-11546.	7.1	90
21	Function constrains network architecture and dynamics: A case study on the yeast cell cycle Boolean network. Physical Review E, 2007, 75, 051907.	2.1	81
22	Direction Selectivity in Drosophila Emerges from Preferred-Direction Enhancement and Null-Direction Suppression. Journal of Neuroscience, 2016, 36, 8078-8092.	3.6	76
23	Emergent elasticity in the neural code for space. Proceedings of the National Academy of Sciences of the United States of America, 2018, 115, E11798-E11806.	7.1	66
24	Discovering Precise Temporal Patterns in Large-Scale Neural Recordings through Robust and Interpretable Time Warping. Neuron, 2020, 105, 246-259.e8.	8.1	63
25	Embodied intelligence via learning and evolution. Nature Communications, 2021, 12, 5721.	12.8	62
26	An International Laboratory for Systems and Computational Neuroscience. Neuron, 2017, 96, 1213-1218.	8.1	60
27	Deep Learning Models of the Retinal Response to Natural Scenes. Advances in Neural Information Processing Systems, 2016, 29, 1369-1377.	2.8	60
28	Coupling of activity, metabolism and behaviour across the Drosophila brain. Nature, 2021, 593, 244-248.	27.8	59
29	Inferring hidden structure in multilayered neural circuits. PLoS Computational Biology, 2018, 14, e1006291.	3.2	56
30	Statistical Mechanics of Compressed Sensing. Physical Review Letters, 2010, 104, 188701.	7.8	53
31	A neural circuit state change underlying skilled movements. Cell, 2021, 184, 3731-3747.e21.	28.9	45
32	Cell types for our sense of location: where we are and where we are going. Nature Neuroscience, 2017, 20, 1474-1482.	14.8	43
33	Evidence for a causal inverse model in an avian cortico-basal ganglia circuit. Proceedings of the National Academy of Sciences of the United States of America, 2014, 111, 6063-6068.	7.1	42
34	A Hebbian learning rule gives rise to mirror neurons and links them to control theoretic inverse models. Frontiers in Neural Circuits, 2013, 7, 106.	2.8	40
35	Distance-tuned neurons drive specialized path integration calculations in medial entorhinal cortex. Cell Reports, 2021, 36, 109669.	6.4	40
36	Statistical mechanics of complex neural systems and high dimensional data. Journal of Statistical Mechanics: Theory and Experiment, 2013, 2013, P03014.	2.3	36

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37	GluD2- and Cbln1-mediated competitive interactions shape the dendritic arbors of cerebellar Purkinje cells. Neuron, 2021, 109, 629-644.e8.	8.1	32
38	Emergent reliability in sensory cortical coding and inter-area communication. Nature, 2022, 605, 713-721.	27.8	31
39	Coherent Ising machinesâ€"Quantum optics and neural network Perspectives. Applied Physics Letters, 2020, 117, .	3.3	26
40	Enhancing Associative Memory Recall and Storage Capacity Using Confocal Cavity QED. Physical Review X, 2021, 11, .	8.9	25
41	Statistical Mechanics of Optimal Convex Inference in High Dimensions. Physical Review X, 2016, 6, .	8.9	19
42	Feedforward to the Past: The Relation between Neuronal Connectivity, Amplification, and Short-Term Memory. Neuron, 2009, 61, 499-501.	8.1	15
43	A saturation hypothesis to explain both enhanced and impaired learning with enhanced plasticity. ELife, 2017, 6, .	6.0	15
44	Investigating the role of firing-rate normalization and dimensionality reduction in brain-machine interface robustness. , 2013, 2013, 293-8.		11
45	Universality and individuality in neural dynamics across large populations of recurrent networks. Advances in Neural Information Processing Systems, 2019, 2019, 15629-15641.	2.8	10
46	E10orbifolds. Journal of High Energy Physics, 2005, 2005, 057-057.	4.7	9
47	Distinct inÂvivo dynamics of excitatory synapses onto cortical pyramidal neurons and parvalbumin-positive interneurons. Cell Reports, 2021, 37, 109972.	6.4	9
48	Role of the site of synaptic competition and the balance of learning forces for Hebbian encoding of probabilistic Markov sequences. Frontiers in Computational Neuroscience, 2015, 9, 92.	2.1	4
49	Statistical mechanics of low-rank tensor decomposition. Journal of Statistical Mechanics: Theory and Experiment, 2019, 2019, 124016.	2.3	4
50	Twisted Six Dimensional Gauge Theories on Tori, Matrix Models, and Integrable Systems. Journal of High Energy Physics, 2004, 2004, 014-014.	4.7	3
51	Pyret: A Python package for analysis of neurophysiology data. Journal of Open Source Software, 2017, 2, 137.	4.6	3
52	Convolutional recurrent neural network models of dynamics in higher visual cortex. Journal of Vision, 2018, 18, 717.	0.3	2
53	Distinct <i>in vivo</i> Dynamics of Excitatory Synapses Onto Cortical Pyramidal Neurons and Inhibitory Interneurons. SSRN Electronic Journal, 0, , .	0.4	1
54	Shared Cortex-Cerebellum Dynamics in the Execution and Learning of a Motor Task. SSRN Electronic Journal, 0, , .	0.4	1

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55	From deep learning to mechanistic understanding in neuroscience: the structure of retinal prediction.. Advances in Neural Information Processing Systems, 2019, 32, 8537-8547.	2.8	1
56	GluD2- and Cbln1-Mediated Competitive Synaptogenesis Shapes the Dendritic Arbors of Cerebellar Purkinje Cells. SSRN Electronic Journal, 0, , .	0.4	0