L F Abbott

List of Publications by Year
in descending order

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92 papers	21,839 citations	31902 53 h-index	51492 86 g-index
95 all docs	95 docs citations	95 times ranked	13748 citing authors

#	Article	IF	Citations
1	Competitive Hebbian learning through spike-timing-dependent synaptic plasticity. Nature Neuroscience, 2000, 3, 919-926.	7.1	2,193
2	Synaptic plasticity: taming the beast. Nature Neuroscience, 2000, 3, 1178-1183.	7.1	1,822
3	Synaptic Depression and Cortical Gain Control. Science, 1997, 275, 221-224.	6.0	1,377
4	Synaptic computation. Nature, 2004, 431, 796-803.	13.7	1,367
5	Gain Modulation from Background Synaptic Input. Neuron, 2002, 35, 773-782.	3.8	866
6	Generating Coherent Patterns of Activity from Chaotic Neural Networks. Neuron, 2009, 63, 544-557.	3.8	834
7	The neuronal architecture of the mushroom body provides a logic for associative learning. ELife, 2014, 3, e04577.	2.8	833
8	Synaptic computation. Nature, 2004, 431, 796-803.	13.7	734
9	The Effect of Correlated Variability on the Accuracy of a Population Code. Neural Computation, 1999, 11, 91-101.	1.3	729
10	When inhibition not excitation synchronizes neural firing. Journal of Computational Neuroscience, 1994, 1, 313-321.	0.6	696
11	A Quantitative Description of Short-Term Plasticity at Excitatory Synapses in Layer 2/3 of Rat Primary Visual Cortex. Journal of Neuroscience, 1997, 17, 7926-7940.	1.7	527
12	Vector reconstruction from firing rates. Journal of Computational Neuroscience, 1994, 1, 89-107.	0.6	434
13	Cortical Development and Remapping through Spike Timing-Dependent Plasticity. Neuron, 2001, 32, 339-350.	3.8	433
14	Asynchronous states in networks of pulse-coupled oscillators. Physical Review E, 1993, 48, 1483-1490.	0.8	424
15	The complete connectome of a learning and memory centre in an insect brain. Nature, 2017, 548, 175-182.	13.7	424
16	NEURAL NETWORK DYNAMICS. Annual Review of Neuroscience, 2005, 28, 357-376.	5.0	407
17	Inferring single-trial neural population dynamics using sequential auto-encoders. Nature Methods, 2018, 15, 805-815.	9.0	388
18	Random convergence of olfactory inputs in the Drosophila mushroom body. Nature, 2013, 497, 113-117.	13.7	373

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19	Synaptic Depression and the Temporal Response Characteristics of V1 Cells. Journal of Neuroscience, 1998, 18, 4785-4799.	1.7	352
20	A Model of Spatial Map Formation in the Hippocampus of the Rat. Neural Computation, 1996, 8, 85-93.	1.3	333
21	Gating multiple signals through detailed balance of excitation and inhibition in spiking networks. Nature Neuroscience, 2009, 12, 483-491.	7.1	331
22	A model of multiplicative neural responses in parietal cortex.. Proceedings of the National Academy of Sciences of the United States of America, 1996, 93, 11956-11961.	3.3	298
23	Functional Significance of Long-Term Potentiation for Sequence Learning and Prediction. Cerebral Cortex, 1996, 6, 406-416.	1.6	285
24	The dynamic clamp: artificial conductances in biological neurons. Trends in Neurosciences, 1993, 16, 389-394.	4.2	278
25	Optimal Degrees of Synaptic Connectivity. Neuron, 2017, 93, 1153-1164.e7.	3.8	267
26	The dynamic clamp comes of age. Trends in Neurosciences, 2004, 27, 218-224.	4.2	260
27	Transfer of coded information from sensory to motor networks. Journal of Neuroscience, 1995, 15, 6461-6474.	1.7	240
28	Presynaptic inhibition of spinal sensory feedback ensures smooth movement. Nature, 2014, 509, 43-48.	13.7	207
29	Complex cells as cortically amplified simple cells. Nature Neuroscience, 1999, 2, 277-282.	7.1	179
30	Representational Capacity of Face Coding in Monkeys. Cerebral Cortex, 1996, 6, 498-505.	1.6	166
31	Building functional networks of spiking model neurons. Nature Neuroscience, 2016, 19, 350-355.	7.1	163
32	A temporal basis for predicting the sensory consequences of motor commands in an electric fish. Nature Neuroscience, 2014, 17, 416-422.	7.1	155
33	From fixed points to chaos: Three models of delayed discrimination. Progress in Neurobiology, 2013, 103, 214-222.	2.8	151
34	A Computational Model of Motor Neuron Degeneration. Neuron, 2014, 83, 975-988.	3.8	145
35	Drivers and modulators from push-pull and balanced synaptic input. Progress in Brain Research, 2005, 149, 147-155.	0.9	135
36	Theoretical Neuroscience Rising. Neuron, 2008, 60, 489-495.	3.8	127

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37	Generation of stable heading representations in diverse visual scenes. Nature, 2019, 576, 126-131.	13.7	127
38	Invariant Visual Responses From Attentional Gain Fields. Journal of Neurophysiology, 1997, 77, 3267-3272.	0.9	123
39	Decoding neuronal firing and modelling neural networks. Quarterly Reviews of Biophysics, 1994, 27, 291-331.	2.4	115
40	Representations of Novelty and Familiarity in a Mushroom Body Compartment. Cell, 2017, 169, 956-969.e17.	13.5	113
41	Neural population geometry: An approach for understanding biological and artificial neural networks. Current Opinion in Neurobiology, 2021, 70, 137-144.	2.0	112
42	Temporal Responses of C.Âelegans Chemosensory Neurons Are Preserved in Behavioral Dynamics. Neuron, 2014, 81, 616-628.	3.8	110
43	Learning navigational maps through potentiation and modulation of hippocampal place cells. , 1997, 4, 79-94.		100
44	Redundancy Reduction and Sustained Firing with Stochastic Depressing Synapses. Journal of Neuroscience, 2002, 22, 584-591.	1.7	100
45	Extending the effects of spike-timing-dependent plasticity to behavioral timescales. Proceedings of the National Academy of Sciences of the United States of America, 2006, 103, 8876-8881.	3.3	97
46	A network of oscillators. Journal of Physics A, 1990, 23, 3835-3859.	1.6	95
47	Beyond the edge of chaos: Amplification and temporal integration by recurrent networks in the chaotic regime. Physical Review E, 2011, 84, 051908.	0.8	95
48	Building an allocentric travelling direction signal via vector computation. Nature, 2022, 601, 92-97.	13.7	92
49	Neural Trajectories in the Supplementary Motor Area and Motor Cortex Exhibit Distinct Geometries, Compatible with Different Classes of Computation. Neuron, 2020, 107, 745-758.e6.	3.8	90
50	full-FORCE: A target-based method for training recurrent networks. PLoS ONE, 2018, 13, e0191527.	1.1	90
51	Balanced excitation and inhibition are required for high-capacity, noise-robust neuronal selectivity. Proceedings of the National Academy of Sciences of the United States of America, 2017, 114, E9366-E9375.	3.3	88
52	Temporal Dynamics of Convergent Modulation at a Crustacean Neuromuscular Junction. Journal of Neurophysiology, 1998, 80, 2559-2570.	0.9	84
53	Dynamics of random neural networks with bistable units. Physical Review E, 2014, 90, 062710.	0.8	78
54	A model for focal seizure onset, propagation, evolution, and progression. ELife, 2020, 9, .	2.8	62

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55	Decoding Synapses. Journal of Neuroscience, 1996, 16, 6307-6318.	1.7	61
56	Thalamic control of cortical dynamics in a model of flexible motor sequencing. Cell Reports, 2021, 35, 109090.	2.9	60
57	Bayesian Sparse Regression Analysis Documents the Diversity of Spinal Inhibitory Interneurons. Cell, 2016, 165, 220-233.	13.5	59
58	Synaptic Democracy in Active Dendrites. Journal of Neurophysiology, 2006, 96, 2307-2318.	0.9	56
59	Positional Strategies for Connection Specificity and Synaptic Organization in Spinal Sensory-Motor Circuits. Neuron, 2019, 102, 1143-1156.e4.	3.8	55
60	Activity Regulates the Incidence of Heteronymous Sensory-Motor Connections. Neuron, 2015, 87, 111-123.	3.8	52
61	Intrinsic Stability of Temporally Shifted Spike-Timing Dependent Plasticity. PLoS Computational Biology, 2010, 6, e1000961.	1.5	51
62	Transient and Persistent Representations of Odor Value in Prefrontal Cortex. Neuron, 2020, 108, 209-224.e6.	3.8	50
63	Odor Perception on the Two Sides of the Brain: Consistency Despite Randomness. Neuron, 2018, 98, 736-742.e3.	3.8	47
64	Pairwise Analysis Can Account for Network Structures Arising from Spike-Timing Dependent Plasticity. PLoS Computational Biology, 2013, 9, e1002906.	1.5	43
65	Self-Sustained Firing in Populations of Integrate-and-Fire Neurons. SIAM Journal on Applied Mathematics, 1993, 53, 253-264.	0.8	41
66	Divisive inhibition in recurrent networks. Network: Computation in Neural Systems, 2000, 11, 119-129.	2.2	40
67	Heading direction with respect to a reference point modulates place-cell activity. Nature Communications, 2019, 10, 2333.	5.8	40
68	Theory in motion. Current Opinion in Neurobiology, 1995, 5, 832-840.	2.0	38
69	A transformation from temporal to ensemble coding in a model of piriform cortex. ELife, 2018, 7, .	2.8	38
70	Training dynamically balanced excitatory-inhibitory networks. PLoS ONE, 2019, 14, e0220547.	1.1	37
71	Internally Generated Predictions Enhance Neural and Behavioral Detection of Sensory Stimuli in an Electric Fish. Neuron, 2018, 99, 135-146.e3.	3.8	33
72	Mechanism of gain modulation at single neuron and network levels. Journal of Computational Neuroscience, 2008, 25, 158-168.	0.6	31

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73	Transferring Learning from External to Internal Weights in Echo-State Networks with Sparse Connectivity. PLoS ONE, 2012, 7, e37372.	1.1	30
74	Conceptual and technical advances define a key moment for theoretical neuroscience. Nature Neuroscience, 2016, 19, 348-349.	7.1	29
75	Olfactory landmarks and path integration converge to form a cognitive spatial map. Neuron, 2021, 109, 4036-4049.e5.	3.8	28
76	Divisive inhibition in recurrent networks. , 0, .		24
77	Stability and Competition in Multi-spike Models of Spike-Timing Dependent Plasticity. PLoS Computational Biology, 2016, 12, e1004750.	1.5	23
78	Continual Learning in a Multi-Layer Network of an Electric Fish. Cell, 2019, 179, 1382-1392.e10.	13.5	20
79	Evolving the olfactory system with machine learning. Neuron, 2021, 109, 3879-3892.e5.	3.8	20
80	Flexible filtering by neural inputs supports motion computation across states and stimuli. Current Biology, 2021, 31, 5249-5260.e5.	1.8	18
81	Balancing homeostasis and learning in neural circuits. Zoology, 2003, 106, 365-371.	0.6	17
82	Meta-learning synaptic plasticity and memory addressing for continual familiarity detection. Neuron, 2022, 110, 544-557.e8.	3.8	17
83	Supervised Learning Through Neuronal Response Modulation. Neural Computation, 2005, 17, 609-631.	1.3	16
84	The timing game. Nature Neuroscience, 2001, 4, 115-116.	7.1	11
85	Tuning Curves for Arm Posture Control in Motor Cortex Are Consistent with Random Connectivity. PLoS Computational Biology, 2016, 12, e1004910.	1.5	10
86	Generalization of learned responses in the mormyrid electrosensory lobe. ELife, 2019, 8, .	2.8	9
87	Sparse balance: Excitatory-inhibitory networks with small bias currents and broadly distributed synaptic weights. PLoS Computational Biology, 2022, 18, e1008836.	1.5	6
88	Reduced Representation by Neural Networks with Restricted Receptive Fields. Neural Computation, 1995, 7, 507-517.	1.3	3
89	Temporal Characteristics of V1 Cells Arising from Synaptic Depression. , 1998, , 143-148.		1
90	Strength in more than numbers. Nature Neuroscience, 2015, 18, 614-616.	7.1	0

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91	CAUSALITY AND LEARNING IN NEURAL SYSTEMS. , 2006, , .		0
92	Decoding Vectorial Information from Firing Rates. , 1995, , 299-304.		0