Boris S Gutkin

List of Publications by Year
in descending order

132 papers	4,473 citations	136950 32 h-index	128289 60 g-index
149 all docs	149 docs citations	149 times ranked	4263 citing authors

#	Article	IF	Citations
1	Neural Cross-Frequency Coupling: Connecting Architectures, Mechanisms, and Functions. Trends in Neurosciences, 2015, 38, 725-740.	8.6	321
2	Multiple Bumps in a Neuronal Model of Working Memory. SIAM Journal on Applied Mathematics, 2002, 63, 62-97.	1.8	216
3	The Effects of Spike Frequency Adaptation and Negative Feedback on the Synchronization of Neural Oscillators. Neural Computation, 2001, 13, 1285-1310.	2.2	208
4	Dynamics of Membrane Excitability Determine Interspike Interval Variability: A Link Between Spike Generation Mechanisms and Cortical Spike Train Statistics. Neural Computation, 1998, 10, 1047-1065.	2.2	191
5	Phase-Response Curves Give the Responses of Neurons to Transient Inputs. Journal of Neurophysiology, 2005, 94, 1623-1635.	1.8	187
6	Dopamine modulation in the basal ganglia locks the gate to working memory. Journal of Computational Neuroscience, 2006, 20, 153-166.	1.0	169
7	Turning on and off with excitation: the role of spike-timing asynchrony and synchrony in sustained neural activity. Journal of Computational Neuroscience, 2001, 11, 121-134.	1.0	153
8	Nicotine reverses hypofrontality in animal models of addiction and schizophrenia. Nature Medicine, 2017, 23, 347-354.	30.7	142
9	Can one hear the shape of a graph?. Journal of Physics A, 2001, 34, 6061-6068.	1.6	140
10	Speech encoding by coupled cortical theta and gamma oscillations. ELife, 2015, 4, e06213.	6.0	140
11	Co-activation of VTA DA and GABA neurons mediates nicotine reinforcement. Molecular Psychiatry, 2013, 18, 382-393.	7.9	129
12	Homeostatic reinforcement learning for integrating reward collection and physiological stability. ELife, 2014, 3, .	6.0	119
13	Cholinergic Neuromodulation Changes Phase Response Curve Shape and Type in Cortical Pyramidal Neurons. PLoS ONE, 2008, 3, e3947.	2.5	116
14	A neurocomputational hypothesis for nicotine addiction. Proceedings of the National Academy of Sciences of the United States of America, 2006, 103, 1106-1111.	7.1	104
15	Contribution of sublinear and supralinear dendritic integration to neuronal computations. Frontiers in Cellular Neuroscience, 2015, 9, 67.	3.7	93
16	The effects of cholinergic neuromodulation on neuronal phase-response curves of modeled cortical neurons. Journal of Computational Neuroscience, 2009, 26, 289-301.	1.0	91
17	Flexible frequency control of cortical oscillations enables computations required for working memory. Proceedings of the National Academy of Sciences of the United States of America, 2013, 110, 12828-12833.	7.1	75
18	Inhibition of rhythmic neural spiking by noise: the occurrence of a minimum in activity with increasing noise. Die Naturwissenschaften, 2009, 96, 1091-1097.	1.6	69

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19	Passive Dendrites Enable Single Neurons to Compute Linearly Non-separable Functions. PLoS Computational Biology, 2013, 9, e1002867.	3.2	68
20	Activityâ€dependent intracellular chloride accumulation and diffusion controls GABA_A receptorâ€mediated synaptic transmission. Hippocampus, 2011, 21, 885-898.	1.9	58
21	Spike generating dynamics and the conditions for spike-time precision in cortical neurons. Journal of Computational Neuroscience, 2003, 15, 91-103.	1.0	57
22	Inhibition and modulation of rhythmic neuronal spiking by noise. Physical Review E, 2009, 80, 031907.	2.1	56
23	The Role of Ongoing Dendritic Oscillations in Single-Neuron Dynamics. PLoS Computational Biology, 2009, 5, e1000493.	3.2	54
24	Mathematical neuroscience: from neurons to circuits to systems. Journal of Physiology (Paris), 2003, 97, 209-219.	2.1	53
25	Democracy-Independence Trade-Off in Oscillating Dendrites and Its Implications for Grid Cells. Neuron, 2010, 66, 429-437.	8.1	53
26	Reduced Efficacy of the KCC2 Cotransporter Promotes Epileptic Oscillations in a Subiculum Network Model. Journal of Neuroscience, 2016, 36, 11619-11633.	3.6	53
27	Macroscopic phase resetting-curves determine oscillatory coherence and signal transfer in inter-coupled neural circuits. PLoS Computational Biology, 2019, 15, e1007019.	3.2	51
28	Inverse Stochastic Resonance in Cerebellar Purkinje Cells. PLoS Computational Biology, 2016, 12, e1005000.	3.2	49
29	Synchrony of Neuronal Oscillations Controlled by GABAergic Reversal Potentials. Neural Computation, 2007, 19, 706-729.	2.2	44
30	Computational disease modeling â€“ fact or fiction?. BMC Systems Biology, 2009, 3, 56.	3.0	41
31	Neural oscillations as a signature of efficient coding in the presence of synaptic delays. ELife, 2016, 5, .	6.0	40
32	Imbalanced Decision Hierarchy in Addicts Emerging from Drug-Hijacked Dopamine Spiraling Circuit. PLoS ONE, 2013, 8, e61489.	2.5	37
33	Cocaine addiction as a homeostatic reinforcement learning disorder.. Psychological Review, 2017, 124, 130-153.	3.8	36
34	Cortical control of VTA function and influence on nicotine reward. Biochemical Pharmacology, 2013, 86, 1173-1180.	4.4	33
35	Semiclassical Identification of Periodic Orbits in a Quantum Many-Body System. Physical Review Letters, 2017, 118, 164101.	7.8	32
36	Macroscopic phase-resetting curves for spiking neural networks. Physical Review E, 2017, 96, 042311.	2.1	31

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37	Cortical pyramidal cells as non-linear oscillators: Experiment and spike-generation theory. Brain Research, 2007, 1171, 122-137.	2.2	29
38	Transient terminationâ€‰of spiking by noise in coupled neurons. Europhysics Letters, 2008, 81, 20005.	2.0	28
39	Mechanisms for multiple activity modes of VTA dopamine neurons. Frontiers in Computational Neuroscience, 2015, 9, 95.	2.1	27
40	Dynamical â€˜breakingâ€™ of time reversal symmetry. Journal of Physics A: Mathematical and Theoretical, 2007, 40, F761-F769.	2.1	26
41	Impact of Prefrontal Cortex in Nicotine-Induced Excitation of Ventral Tegmental Area Dopamine Neurons in Anesthetized Rats. Journal of Neuroscience, 2012, 32, 12366-12375.	3.6	26
42	Modelling Stock Markets by Multi-agent Reinforcement Learning. Computational Economics, 2021, 57, 113-147.	2.6	26
43	Endogenous Cholinergic Inputs and Local Circuit Mechanisms Govern the Phasic Mesolimbic Dopamine Response to Nicotine. PLoS Computational Biology, 2013, 9, e1003183.	3.2	25
44	Efficient and robust coding in heterogeneous recurrent networks. PLoS Computational Biology, 2021, 17, e1008673.	3.2	24
45	Hyperbolic Billiards on Surfaces of Constant Curvature. Communications in Mathematical Physics, 1999, 208, 65-90.	2.2	23
46	Modeling nicotinic neuromodulation from global functional and network levels to nAChR based mechanisms. Acta Pharmacologica Sinica, 2009, 30, 681-693.	6.1	23
47	Hippocampal Interneuronal Î±7 nAChRs Modulate Theta Oscillations in Freely Moving Mice. Cell Reports, 2020, 31, 107740.	6.4	23
48	Transition from quantum chaos to localization in spin chains. Physical Review E, 2020, 101, 052201.	2.1	23
49	Spike frequency adaptation. Scholarpedia Journal, 2014, 9, 30643.	0.3	21
50	Spike-Timing Dependent Plasticity and Feed-Forward Input Oscillations Produce Precise and Invariant Spike Phase-Locking. Frontiers in Computational Neuroscience, 2011, 5, 45.	2.1	20
51	Dopamine Neurons Change the Type of Excitability in Response to Stimuli. PLoS Computational Biology, 2016, 12, e1005233.	3.2	20
52	Controlling Working Memory Operations by Selective Gating: The Roles of Oscillations and Synchrony. Advances in Cognitive Psychology, 2016, 12, 209-232.	0.5	20
53	Adaptation and shunting inhibition leads to pyramidal/interneuron gamma with sparse firing of pyramidal cells. Journal of Computational Neuroscience, 2014, 37, 357-376.	1.0	18
54	A review of methods for identifying stochastic resonance in simulations of single neuron models. Network: Computation in Neural Systems, 2015, 26, 35-71.	3.6	18

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55	Quantum corrections to fidelity decay in chaotic systems. Physical Review E, 2010, 81, 036222.	2.1	17
56	Exact local correlations in kicked chains. Physical Review B, 2020, 102, .	3.2	17
57	Layer 3 patchy recurrent excitatory connections may determine the spatial organization of sustained activity in the primate prefrontal cortex. Neurocomputing, 2000, 32-33, 391-400.	5.9	16
58	A reduced model of DA neuronal dynamics that displays quiescence, tonic firing and bursting. Journal of Physiology (Paris), 2011, 105, 53-58.	2.1	16
59	Correlations in background activity control persistent state stability and allow execution of working memory tasks. Frontiers in Computational Neuroscience, 2013, 7, 139.	2.1	16
60	Classical foundations of many-particle quantum chaos. Nonlinearity, 2016, 29, 325-356.	1.4	16
61	Hyperbolic Magnetic Billiards on SurfacesÂ¶of Constant Curvature. Communications in Mathematical Physics, 2001, 217, 33-53.	2.2	15
62	Phase Dependent Sign Changes of GABAergic Synaptic Input Explored In-Silicio and In-Vitro. Journal of Computational Neuroscience, 2005, 19, 71-85.	1.0	15
63	Understanding the Role Î±7 Nicotinic Receptors Play in Dopamine Efflux in Nucleus Accumbens. ACS Chemical Neuroscience, 2014, 5, 1032-1040.	3.5	15
64	Dynamical ventral tegmental area circuit mechanisms of alcoholâ€dependent dopamine release. European Journal of Neuroscience, 2019, 50, 2282-2296.	2.6	15
65	The Simulation of Addiction: Pharmacological and Neurocomputational Models of Drug Self-Administration. Drug and Alcohol Dependence, 2007, 90, 304-311.	3.2	14
66	Random perturbations of spiking activity in a pair of coupled neurons. Theory in Biosciences, 2008, 127, 135-139.	1.4	14
67	Implications of cellular models of dopamine neurons for disease. Journal of Neurophysiology, 2016, 116, 2815-2830.	1.8	14
68	Contribution of synchronized GABAergic neurons to dopaminergic neuron firing and bursting. Journal of Neurophysiology, 2016, 116, 1900-1923.	1.8	14
69	Estimating the Information Extracted by a Single Spiking Neuron from a Continuous Input Time Series. Frontiers in Computational Neuroscience, 2017, 11, 49.	2.1	14
70	Neurocomputational theories of homeostatic control. Physics of Life Reviews, 2019, 31, 214-232.	2.8	14
71	Sensory noise predicts divisive reshaping of receptive fields. PLoS Computational Biology, 2017, 13, e1005582.	3.2	14
72	Splay States in Finite Pulse-Coupled Networks of Excitable Neurons. SIAM Journal on Applied Dynamical Systems, 2012, 11, 864-894.	1.6	13

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73	Synergy of AMPA and NMDA Receptor Currents in Dopaminergic Neurons: A Modeling Study. Frontiers in Computational Neuroscience, 2016, 10, 48.	2.1	13
74	Concomitance of inverse stochastic resonance and stochastic resonance in a minimal bistable spiking neural circuit. Communications in Nonlinear Science and Numerical Simulation, 2020, 82, 105024.	3.3	13
75	Spikes too kinky in the cortex?. Nature, 2006, 440, 999-1000.	27.8	12
76	Comprehensive Mathematical Modeling in Drug Addiction Sciences. Drug and Alcohol Dependence, 2007, 89, 102-106.	3.2	12
77	Note on converse quantum ergodicity. Proceedings of the American Mathematical Society, 2009, 137, 2795-2795.	0.8	12
78	Misdeed of the need: towards computational accounts of transition to addiction. Current Opinion in Neurobiology, 2017, 46, 142-153.	4.2	12
79	Analytical Insights on Theta-Gamma Coupled Neural Oscillators. Journal of Mathematical Neuroscience, 2013, 3, 16.	2.4	11
80	Noise delays onset of sustained firing in a minimal model of persistent activity. Neurocomputing, 2004, 58-60, 753-760.	5.9	10
81	Entropic Bounds on Semiclassical Measures for Quantized One-Dimensional Maps. Communications in Mathematical Physics, 2010, 294, 303-342.	2.2	10
82	Clustering of periodic orbits in chaotic systems. Nonlinearity, 2013, 26, 177-200.	1.4	10
83	Can billiard eigenstates be approximated by superpositions of plane waves?. Journal of Physics A, 2003, 36, 8603-8622.	1.6	9
84	A Theoretical Framework for the Dynamics of Multiple Intrinsic Oscillators in Single Neurons. , 2012, , 53-72.		9
85	Generalized Cross-Frequency Decomposition: A Method for the Extraction of Neuronal Components Coupled at Different Frequencies. Frontiers in Neuroinformatics, 2018, 12, 72.	2.5	8
86	Adaptation and Inhibition Control Pathological Synchronization in a Model of Focal Epileptic Seizure. ENeuro, 2018, 5, ENEURO.0019-18.2018.	1.9	8
87	26th Annual Computational Neuroscience Meeting (CNS*2017): Part 2. BMC Neuroscience, 2017, 18, .	1.9	7
88	Semiclassical prediction of large spectral fluctuations in interacting kicked spin chains. Annals of Physics, 2018, 389, 250-282.	2.8	7
89	Progressive alignment of inhibitory and excitatory delay may drive a rapid developmental switch in cortical network dynamics. Journal of Neurophysiology, 2020, 123, 1583-1599.	1.8	7
90	A Control Theory Model of Smoking. , 2017, 2017, .		7

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91	Effects of dopaminergic modulation of persistent sodium currents on the excitability of prefrontal cortical neurons: A computational study. Neurocomputing, 1999, 26-27, 107-115.	5.9	6
92	Collective versus single-particle motion in quantum many-body systems from the perspective of an integrable model. Journal of Physics A: Mathematical and Theoretical, 2010, 43, 265101.	2.1	6
93	Conditions for noise reduction and stable encoding of spatial structure by cortical neural networks. Biological Cybernetics, 2000, 82, 469-475.	1.3	5
94	Study on the role of GABAergic synapses in synchronization. Neurocomputing, 2005, 65-66, 859-868.	5.9	5
95	Temporal integration and 1/f power scaling in a circuit model of cerebellar interneurons. Journal of Neurophysiology, 2017, 118, 471-485.	1.8	5
96	Cholinergic Neuromodulation Controls PRC Type in Cortical Pyramidal Neurons. , 2012, , 279-305.		4
97	Clustering of Periodic Orbits and Ensembles of Truncated Unitary Matrices. Journal of Statistical Physics, 2013, 153, 1049-1064.	1.2	4
98	Robustness of persistent spiking to partial synchronization in a minimal model of synaptically driven self-sustained activity. Physical Review E, 2016, 94, 052313.	2.1	4
99	Action in auctions: neural and computational mechanisms of bidding behaviour. European Journal of Neuroscience, 2019, 50, 3327-3348.	2.6	4
100	Modeling dopaminergic modulation of clustered gamma rhythms. Communications in Nonlinear Science and Numerical Simulation, 2020, 82, 105086.	3.3	4
101	A minimal model for metabotropic modulation of fast synaptic transmission and firing properties in bullfrog sympathetic B neurons. Neurocomputing, 1999, 26-27, 255-262.	5.9	3
102	Spectral statistics of â€˜cellularâ€™ billiards. Nonlinearity, 2011, 24, 1743-1757.	1.4	3
103	Dendrites Enhance Both Single Neuron and Network Computation. Springer Series in Computational Neuroscience, 2014, , 365-380.	0.3	3
104	Spectral statistics of nearly unidirectional quantum graphs. Journal of Physics A: Mathematical and Theoretical, 2015, 48, 345101.	2.1	3
105	Spreading in integrable and non-integrable many-body systems. Physica A: Statistical Mechanics and Its Applications, 2016, 461, 683-693.	2.6	3
106	Activity Stabilization in a Population Model of Working Memory by Sinusoidal and Noisy Inputs. Frontiers in Neural Circuits, 2021, 15, 647944.	2.8	3
107	Distinct Temporal Structure of Nicotinic ACh Receptor Activation Determines Responses of VTA Neurons to Endogenous ACh and Nicotine. ENeuro, 2020, 7, ENEURO.0418-19.2020.	1.9	3
108	Dopaminergic Neurons in the Ventral Tegmental Area and Their Dysregulation in Nicotine Addiction. , 2018, , 47-84.		2

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109	Changes in neuronal oscillations account for working memory dynamics: EEG-tACS study. Brain Stimulation, 2019, 12, e168.	1.6	2
110	Role of synaptic nonlinearity in persistent firing rate shifts caused by external periodic forcing. Physical Review E, 2020, 101, 052408.	2.1	2
111	Theta-Neuron Model. , 2014, , 1-9.		2
112	A Trade-Off Between Dendritic Democracy and Independence in Neurons with Intrinsic Subthreshold Membrane Potential Oscillations. Springer Series in Computational Neuroscience, 2014, , 347-364.	0.3	2
113	Minimal Circuit Model of Reward Prediction Error Computations and Effects of Nicotinic Modulations. Frontiers in Neural Circuits, 2018, 12, 116.	2.8	2
114	Phase response approaches to neural activity models with distributed delay. Biological Cybernetics, 2021, , 1.	1.3	2
115	Drug-dominated dopamine circuits spiral addicts down to a cognitive/behavioral conflict: a neurocomputational theory. BMC Neuroscience, 2012, 13, .	1.9	1
116	Functional interpretation of biophysical properties of spiking neurons. BMC Neuroscience, 2013, 14, .	1.9	1
117	Effects of a reduced efficacy of the KCC2 co-transporter in temporal lobe epilepsy: single neuron and network study. BMC Neuroscience, 2015, 16, .	1.9	1
118	Cholinergic modulation of hierarchical inhibitory control over cortical resting state dynamics: Local circuit modeling of schizophrenia-related hypofrontality. Current Research in Neurobiology, 2021, 2, 100018.	2.3	1
119	Modelling Local Circuit Mechanisms for Nicotine Control of Dopamine Activity. , 2012, , 111-144.		1
120	ÐÐ¾Ð»ÑŒ Ð±ÐµÑ‚Ð°- Ð¸ Ð³Ð°Ð¼Ð¼Ð°-Ñ€Ð¸Ñ‚Ð¼Ð¾Ð² Ð² Ñ€ÐµÐ°Ð»Ð¸Ð·Ð°Ñ†Ð¸Ð¸ Ñ„ÑƒÐ½ÐºÑ†Ð¸Ð¹ Ñ€Ð°Ð±Ð¾Ñ‡ÐµÐ¹ Ð¿Ð°Ð	0.4	1
121	Stock Price Formation: Precepts from a Multi-Agent Reinforcement Learning Model. Computational Economics, 2023, 61, 1523-1544.	2.6	1
122	Theta Neuron Model. , 2022, , 3412-3419.		1
123	Editorial. Network: Computation in Neural Systems, 2008, 19, 1-2.	3.6	0
124	Modulation of dopamine release by Î±7-type nicotinic acetylcholine receptors. BMC Neuroscience, 2013, 14, .	1.9	0
125	A difficult classification for neurons without dendrites. , 2013, , .		0
126	S.08.04 Mathematical models of nicotine-induced neuroadaptations. European Neuropsychopharmacology, 2013, 23, S124.	0.7	0

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127	A role of local VTA GABAergic neurons in mediating dopamine neuron response to nicotine. BMC Neuroscience, 2015, 16, .	1.9	0
128	26th Annual Computational Neuroscience Meeting (CNS*2017): Part 1. BMC Neuroscience, 2017, 18, .	1.9	0
129	GSE spectra in uni-directional quantum systems. Journal of Physics A: Mathematical and Theoretical, 2019, 52, 235201.	2.1	0
130	Role of Pyramidal Cell M-current in Weak Pyramidal/Interneuronal Gamma Cluster Formation. , 2020, , .		0
131	Basal Ganglia: Dopaminergic Cell Models. , 2020, , 1-10.		0
132	Basal Ganglia: Dopaminergic Cell Models. , 2022, , 383-392.		0