Idan Segev

List of Publications by Year
in descending order

114 papers	10,596 citations	38742 50 h-index	39675 94 g-index
137 all docs	137 docs citations	137 times ranked	7221 citing authors

#	Article	IF	Citations
1	Reconstruction and Simulation of Neocortical Microcircuitry. Cell, 2015, 163, 456-492.	28.9	1,258
2	Dendritic asymmetry cannot account for directional responses of neurons in visual cortex. Nature Neuroscience, 1999, 2, 820-824.	14.8	476
3	The role of single neurons in information processing. Nature Neuroscience, 2000, 3, 1171-1177.	14.8	428
4	Ion Channel Stochasticity May Be Critical in Determining the Reliability and Precision of Spike Timing. Neural Computation, 1998, 10, 1679-1703.	2.2	375
5	Models of Neocortical Layer 5b Pyramidal Cells Capturing aÂWide Range of Dendritic and Perisomatic Active Properties. PLoS Computational Biology, 2011, 7, e1002107.	3.2	313
6	Untangling Dendrites with Quantitative Models. Science, 2000, 290, 744-750.	12.6	275
7	A novel multiple objective optimization framework for constraining conductance-based neuron models by experimental data. Frontiers in Neuroscience, 2007, 1, 7-18.	2.8	260
8	Effect of geometrical irregularities on propagation delay in axonal trees. Biophysical Journal, 1991, 60, 1424-1437.	0.5	253
9	Coding of Temporal Information by Activity-Dependent Synapses. Journal of Neurophysiology, 2002, 87, 140-148.	1.8	241
10	Computational study of an excitable dendritic spine. Journal of Neurophysiology, 1988, 60, 499-523.	1.8	210
11	Principles Governing the Operation of Synaptic Inhibition in Dendrites. Neuron, 2012, 75, 330-341.	8.1	201
12	Signal enhancement in distal cortical dendrites by means of interactions between active dendritic spines.. Proceedings of the National Academy of Sciences of the United States of America, 1985, 82, 2192-2195.	7.1	198
13	Electrotonic architecture of type-identified alpha-motoneurons in the cat spinal cord. Journal of Neurophysiology, 1988, 60, 60-85.	1.8	198
14	Dendritic and Axonal Architecture of Individual Pyramidal Neurons across Layers of Adult Human Neocortex. Cerebral Cortex, 2015, 25, 4839-4853.	2.9	194
15	Low-Amplitude Oscillations in the Inferior Olive: A Model Based on Electrical Coupling of Neurons With Heterogeneous Channel Densities. Journal of Neurophysiology, 1997, 77, 2736-2752.	1.8	188
16	A Brief History of Time (Constants). Cerebral Cortex, 1996, 6, 93-101.	2.9	178
17	The Impact of Parallel Fiber Background Activity on the Cable Properties of Cerebellar Purkinje Cells. Neural Computation, 1992, 4, 518-533.	2.2	163
18	Excitable dendrites and spines: earlier theoretical insights elucidate recent direct observations. Trends in Neurosciences, 1998, 21, 453-460.	8.6	163

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19	Human neocortical expansion involves glutamatergic neuron diversification. Nature, 2021, 598, 151-158.	27.8	160
20	Physiology, morphology and detailed passive models of guineaâ€pig cerebellar Purkinje cells.. Journal of Physiology, 1994, 474, 101-118.	2.9	156
21	Unique membrane properties and enhanced signal processing in human neocortical neurons. ELife, 2016, 5, .	6.0	154
22	The information efficacy of a synapse. Nature Neuroscience, 2002, 5, 332-340.	14.8	141
23	On the Transmission of Rate Code in Long Feedforward Networks with Excitatoryâ€"Inhibitory Balance. Journal of Neuroscience, 2003, 23, 3006-3015.	3.6	139
24	The neocortical microcircuit collaboration portal: a resource for rat somatosensory cortex. Frontiers in Neural Circuits, 2015, 9, 44.	2.8	138
25	BluePyOpt: Leveraging Open Source Software and Cloud Infrastructure to Optimise Model Parameters in Neuroscience. Frontiers in Neuroinformatics, 2016, 10, 17.	2.5	138
26	Organization of Octopus Arm Movements: A Model System for Studying the Control of Flexible Arms. Journal of Neuroscience, 1996, 16, 7297-7307.	3.6	137
27	Computer study of presynaptic inhibition controlling the spread of action potentials into axonal terminals. Journal of Neurophysiology, 1990, 63, 987-998.	1.8	132
28	Single neurone models: oversimple, complex and reduced. Trends in Neurosciences, 1992, 15, 414-421.	8.6	130
29	Dendrites Impact the Encoding Capabilities of the Axon. Journal of Neuroscience, 2014, 34, 8063-8071.	3.6	129
30	Signal delay and input synchronization in passive dendritic structures. Journal of Neurophysiology, 1993, 70, 2066-2085.	1.8	125
31	Optimization principles of dendritic structure. Theoretical Biology and Medical Modelling, 2007, 4, 21.	2.1	124
32	Subthreshold voltage noise due to channel fluctuations in active neuronal membranes. Journal of Computational Neuroscience, 2000, 9, 133-148.	1.0	118
33	Rich cell-type-specific network topology in neocortical microcircuitry. Nature Neuroscience, 2017, 20, 1004-1013.	14.8	113
34	Subthreshold voltage noise of rat neocortical pyramidal neurones. Journal of Physiology, 2005, 564, 145-160.	2.9	109
35	Modeling back propagating action potential in weakly excitable dendrites of neocortical pyramidal cells.. Proceedings of the National Academy of Sciences of the United States of America, 1996, 93, 11985-11990.	7.1	107
36	Single cortical neurons as deep artificial neural networks. Neuron, 2021, 109, 2727-2739.e3.	8.1	104

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37	Human Cortical Pyramidal Neurons: From Spines to Spikes via Models. Frontiers in Cellular Neuroscience, 2018, 12, 181.	3.7	102
38	A mathematical model for conduction of action potentials along bifurcating axons.. Journal of Physiology, 1979, 295, 323-343.	2.9	101
39	Modeling the electrical behavior of anatomically complex neurons using a network analysis program: Passive membrane. Biological Cybernetics, 1985, 53, 27-40.	1.3	95
40	Computer simulation of group Ia EPSPs using morphologically realistic models of cat alpha-motoneurons. Journal of Neurophysiology, 1990, 64, 648-660.	1.8	94
41	Whole-Neuron Synaptic Mapping Reveals Spatially Precise Excitatory/Inhibitory Balance Limiting Dendritic and Somatic Spiking. Neuron, 2020, 106, 566-578.e8.	8.1	94
42	Modeling a layer 4-to-layer 2/3 module of a single column in rat neocortex: Interweaving <i>in vitro</i> and <i>in vivo</i> experimental observations. Proceedings of the National Academy of Sciences of the United States of America, 2007, 104, 16353-16358.	7.1	90
43	Comprehensive Morpho-Electrotonic Analysis Shows 2 Distinct Classes of L2 and L3 Pyramidal Neurons in Human Temporal Cortex. Cerebral Cortex, 2017, 27, 5398-5414.	2.9	85
44	Two opposing plasticity mechanisms pulling a single synapse. Trends in Neurosciences, 2008, 31, 377-383.	8.6	83
45	Interpretation of time constant and electrotonic length estimates in multicylinder or branched neuronal structures. Journal of Neurophysiology, 1992, 68, 1401-1420.	1.8	75
46	Playing the Devil's advocate: is the Hodgkinâ€“Huxley model useful?. Trends in Neurosciences, 2002, 25, 558-563.	8.6	67
47	Preserving axosomatic spiking features despite diverse dendritic morphology. Journal of Neurophysiology, 2013, 109, 2972-2981.	1.8	64
48	A Hierarchical Structure of Cortical Interneuron Electrical Diversity Revealed by Automated Statistical Analysis. Cerebral Cortex, 2013, 23, 2994-3006.	2.9	63
49	Timed Synaptic Inhibition Shapes NMDA Spikes, Influencing Local Dendritic Processing and Global I/O Properties of Cortical Neurons. Cell Reports, 2017, 21, 1550-1561.	6.4	62
50	Reading Neuronal Synchrony with Depressing Synapses. Neural Computation, 1998, 10, 815-819.	2.2	60
51	Signal Transfer in Passive Dendrites with Nonuniform Membrane Conductance. Journal of Neuroscience, 1999, 19, 8219-8233.	3.6	59
52	Dendritic Excitability and Gain Control in Recurrent Cortical Microcircuits. Cerebral Cortex, 2015, 25, 3561-3571.	2.9	57
53	Space-Clamp Problems When Voltage Clamping Branched Neurons With Intracellular Microelectrodes. , 1985, , 191-215.		56
54	Synaptic scaling in vitro and in vivo. Nature Neuroscience, 2001, 4, 853-854.	14.8	55

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55	Multiple mechanisms govern the dynamics of depression at neocortical synapses of young rats. Journal of Physiology, 2004, 557, 415-438.	2.9	55
56	Synaptic integration mechanisms. Theoretical and experimental investigation of temporal postsynaptic interactions between excitatory and inhibitory inputs. Biophysical Journal, 1983, 41, 41-50.	0.5	53
57	Robust coding of flow-field parameters by axo-axonal gap junctions between fly visual interneurons. Proceedings of the National Academy of Sciences of the United States of America, 2007, 104, 10229-10233.	7.1	53
58	Evaluating automated parameter constraining procedures of neuron models by experimental and surrogate data. Biological Cybernetics, 2008, 99, 371-379.	1.3	53
59	Axons as computing devices: Basic insights gained from models. Journal of Physiology (Paris), 1999, 93, 263-270.	2.1	49
60	Effective Stimuli for Constructing Reliable Neuron Models. PLoS Computational Biology, 2011, 7, e1002133.	3.2	49
61	Differential Structure of Hippocampal CA1 Pyramidal Neurons in the Human and Mouse. Cerebral Cortex, 2020, 30, 730-752.	2.9	49
62	The role of dendritic inhibition in shaping the plasticity of excitatory synapses. Frontiers in Neural Circuits, 2013, 6, 118.	2.8	47
63	Sound grounds for computing dendrites. Nature, 1998, 393, 207-208.	27.8	45
64	Voltage behavior along the irregular dendritic structure of morphologically and physiologically characterized vagal motoneurons in the guinea pig. Journal of Neurophysiology, 1990, 63, 333-346.	1.8	44
65	A Biologically Realistic Model of Contrast Invariant Orientation Tuning by Thalamocortical Synaptic Depression. Journal of Neuroscience, 2007, 27, 10230-10239.	3.6	44
66	The Interplay Between Homeostatic Synaptic Plasticity and Functional Dendritic Compartments. Journal of Neurophysiology, 2006, 96, 276-283.	1.8	42
67	Propagation of action potentials along complex axonal trees. Model and implementation. Biophysical Journal, 1991, 60, 1411-1423.	0.5	40
68	Modeling the electrical behavior of anatomically complex neurons using a network analysis program: Excitable membrane. Biological Cybernetics, 1985, 53, 41-56.	1.3	37
69	The Generation of Phase Differences and Frequency Changes in a Network Model of Inferior Olive Subthreshold Oscillations. PLoS Computational Biology, 2012, 8, e1002580.	3.2	37
70	Dynamic and spatial features of the inhibitory pallidal GABAergic synapses. Neuroscience, 2005, 135, 791-802.	2.3	31
71	A calcium-based plasticity model for predicting long-term potentiation and depression in the neocortex. Nature Communications, 2022, 13, .	12.8	30
72	What do dendrites and their synapses tell the neuron?. Journal of Neurophysiology, 2006, 95, 1295-1297.	1.8	28

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73	The Endurance and Selectivity of Spatial Patterns of Long-Term Potentiation/Depression in Dendrites under Homeostatic Synaptic Plasticity. Journal of Neuroscience, 2006, 26, 13474-13484.	3.6	28
74	Spike propagation in dendrites with stochastic ion channels. Journal of Computational Neuroscience, 2006, 20, 77-84.	1.0	27
75	From Neuron Biophysics to Orientation Selectivity in Electrically Coupled Networks of Neocortical L2/3 Large Basket Cells. Cerebral Cortex, 2016, 26, 3655-3668.	2.9	27
76	Electrical consequences of spine dimensions in a model of a cortical spiny stellate cell completely reconstructed from serial thin sections. Journal of Computational Neuroscience, 1995, 2, 117-130.	1.0	26
77	Interregional synaptic competition in neurons with multiple STDP-inducing signals. Journal of Neurophysiology, 2011, 105, 989-998.	1.8	23
78	Contribution of Intracolumnar Layer 2/3-to-Layer 2/3 Excitatory Connections in Shaping the Response to Whisker Deflection in Rat Barrel Cortex. Cerebral Cortex, 2015, 25, 849-858.	2.9	23
79	Perceptron Learning and Classification in a Modeled Cortical Pyramidal Cell. Frontiers in Computational Neuroscience, 2020, 14, 33.	2.1	23
80	An efficient analytical reduction of detailed nonlinear neuron models. Nature Communications, 2020, 11, 288.	12.8	22
81	Strong and reliable synaptic communication between pyramidal neurons in adult human cerebral cortex. Cerebral Cortex, 2023, 33, 2857-2878.	2.9	21
82	Synchrony is stubborn in feedforward cortical networks. Nature Neuroscience, 2003, 6, 543-544.	14.8	20
83	Spatially Distributed Dendritic Resonance Selectively Filters Synaptic Input. PLoS Computational Biology, 2014, 10, e1003775.	3.2	18
84	A paradoxical isopotentiality: a spatially uniform noise spectrum in neocortical pyramidal cells. Frontiers in Cellular Neuroscience, 2008, 2, 3.	3.7	16
85	Efficient encoding of motion is mediated by gap junctions in the fly visual system. PLoS Computational Biology, 2017, 13, e1005846.	3.2	14
86	Spike-Timingâ€"Dependent Synaptic Plasticity and Synaptic Democracy in Dendrites. Journal of Neurophysiology, 2009, 101, 3226-3234.	1.8	13
87	Comments and General Discussion on â€œThe Anatomical Problem Posed by Brain Complexity and Size: A Potential Solutionâ€. Frontiers in Neuroanatomy, 2016, 10, 60.	1.7	13
88	The gradient clusteron: A model neuron that learns to solve classification tasks via dendritic nonlinearities, structural plasticity, and gradient descent. PLoS Computational Biology, 2021, 17, e1009015.	3.2	13
89	Depressed Responses of Facilitatory Synapses. Journal of Neurophysiology, 2005, 94, 865-870.	1.8	12
90	Maximally efficient prediction in the early fly visual system may support evasive flight maneuvers. PLoS Computational Biology, 2021, 17, e1008965.	3.2	9

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91	Burst control: Synaptic conditions for burst generation in cortical layer 5 pyramidal neurons. PLoS Computational Biology, 2021, 17, e1009558.	3.2	9
92	The unimodal distribution of subâ€“threshold, ongoing activity in cortical networks. Frontiers in Neural Circuits, 2013, 7, 116.	2.8	8
93	Using subthreshold events to characterize the functional architecture of the electrically coupled inferior olive network. ELife, 2020, 9, .	6.0	8
94	Taming time in the olfactory bulb. Nature Neuroscience, 1999, 2, 1041-1043.	14.8	7
95	The Role of Hub Neurons in Modulating Cortical Dynamics. Frontiers in Neural Circuits, 2021, 15, 718270.	2.8	7
96	Chapter 11 Neurones as physical objects: Structure, dynamics and function. Handbook of Biological Physics, 2001, 4, 353-467.	0.8	6
97	Realistic retinal modeling unravels the differential role of excitation and inhibition to starburst amacrine cells in direction selectivity. PLoS Computational Biology, 2021, 17, e1009754.	3.2	6
98	Brain and art. Frontiers in Human Neuroscience, 2014, 8, 465.	2.0	5
99	Discovering Unexpected Local Nonlinear Interactions in Scientific Black-box Models. , 2019, , .		4
100	Nonlinear cable properties of the giant axon of the cockroach Periplaneta americana.. Journal of General Physiology, 1985, 85, 729-741.	1.9	3
101	Conducting synaptic music in dendrites. Nature Neuroscience, 2004, 7, 904-905.	14.8	3
102	Losing the battle but winning the war: game theoretic analysis of the competition between motoneurons innervating a skeletal muscle. Frontiers in Computational Neuroscience, 2012, 6, 16.	2.1	3
103	Non-uniform weighting of local motion inputs underlies dendritic computation in the fly visual system. Scientific Reports, 2018, 8, 5787.	3.3	3
104	Synaptic Input and ACh Modulation Regulate Dendritic Ca²⁺Spike Duration in Pyramidal Neurons, Directly Affecting Their Somatic Output. Journal of Neuroscience, 2022, 42, 1184-1195.	3.6	3
105	Building Bridges through Science. Neuron, 2017, 96, 730-735.	8.1	2
106	Editorial: Dynamics and Modulation of Synaptic Transmission in the Mammalian CNS. Frontiers in Synaptic Neuroscience, 2019, 11, 11.	2.5	2
107	Brain Projects Think Big. Frontiers for Young Minds, 2013, 1, .	0.8	1
108	A theoretical view of the neuron as a plastic input-output device. , 2007, , 321-349.		1

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109	Teaching assistants. Les Houches Summer School Proceedings, 2005, 80, x.	0.2	0
110	Modeling network phenomena in the Inferior Olive: I. Keeping track of time. BMC Neuroscience, 2011, 12, .	1.9	0
111	Modeling network phenomena in the Inferior Olive: II. Modulation of sub-threshold oscillations. BMC Neuroscience, 2011, 12, .	1.9	0
112	Computational Neuroscience: Capturing the Essence. , 2013, , 671-694.		0
113	Wilfrid Rall (1922â€“2018). Neuron, 2018, 99, 877-879.	8.1	0
114	Statistical Emulation of Neural Simulators: Application to Neocortical L2/3 Large Basket Cells. Frontiers in Big Data, 2022, 5, 789962.	2.9	0