

Stephen Grossberg

List of Publications by Citations

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130
papers

17,684
citations

55
h-index

132
g-index

133
ext. papers

19,666
ext. citations

4.3
avg, IF

7.11
L-index

#	Paper	IF	Citations
130	A massively parallel architecture for a self-organizing neural pattern recognition machine. <i>Computer Vision, Graphics, and Image Processing</i> , 1987 , 37, 54-115		1759
129	Absolute stability of global pattern formation and parallel memory storage by competitive neural networks. <i>IEEE Transactions on Systems, Man, and Cybernetics</i> , 1983 , SMC-13, 815-826		1370
128	How does a brain build a cognitive code?. <i>Psychological Review</i> , 1980 , 87, 1-51	6.3	1218
127	Nonlinear neural networks: Principles, mechanisms, and architectures. <i>Neural Networks</i> , 1988 , 1, 17-61	9.1	1051
126	Neural dynamics of form perception: Boundary completion, illusory figures, and neon color spreading.. <i>Psychological Review</i> , 1985 , 92, 173-211	6.3	966
125	ARTMAP: Supervised real-time learning and classification of nonstationary data by a self-organizing neural network. <i>Neural Networks</i> , 1991 , 4, 565-588	9.1	716
124	Neural dynamics of perceptual grouping: textures, boundaries, and emergent segmentations. <i>Perception & Psychophysics</i> , 1985 , 38, 141-71		680
123	Studies of Mind and Brain. <i>Boston Studies in the Philosophy and History of Science</i> , 1982 ,	0.2	497
122	Contour Enhancement, Short Term Memory, and Constancies in Reverberating Neural Networks. <i>Studies in Applied Mathematics</i> , 1973 , 52, 213-257	2.1	496
121	Adaptive pattern classification and universal recoding: II. Feedback, expectation, olfaction, illusions. <i>Biological Cybernetics</i> , 1976 , 23, 187-202	2.8	394
120	3-D vision and figure-ground separation by visual cortex. <i>Perception & Psychophysics</i> , 1994 , 55, 48-121		391
119	How the basal ganglia use parallel excitatory and inhibitory learning pathways to selectively respond to unexpected rewarding cues. <i>Journal of Neuroscience</i> , 1999 , 19, 10502-11	6.6	340
118	Metabotropic glutamate receptor activation in cerebellar Purkinje cells as substrate for adaptive timing of the classically conditioned eye-blink response. <i>Journal of Neuroscience</i> , 1996 , 16, 3760-74	6.6	337
117	Adaptive Resonance Theory: how a brain learns to consciously attend, learn, and recognize a changing world. <i>Neural Networks</i> , 2013 , 37, 1-47	9.1	316
116	Contrast-sensitive perceptual grouping and object-based attention in the laminar circuits of primary visual cortex. <i>Vision Research</i> , 2000 , 40, 1413-32	2.1	275
115	How does the cerebral cortex work? Learning, attention, and grouping by the laminar circuits of visual cortex. <i>Spatial Vision</i> , 1999 , 12, 163-85		269
114	Cortical dynamics of three-dimensional form, color, and brightness perception: II. Binocular theory. <i>Perception & Psychophysics</i> , 1987 , 41, 117-58		228

113	The complementary brain: unifying brain dynamics and modularity. <i>Trends in Cognitive Sciences</i> , 2000 , 4, 233-246	14	226
112	A neural theory of punishment and avoidance, II: quantitative theory. <i>Mathematical Biosciences</i> , 1972 , 15, 253-285	3.9	222
111	Pattern formation, contrast control, and oscillations in the short term memory of shunting on-center off-surround networks. <i>Biological Cybernetics</i> , 1975 , 20, 69-98	2.8	219
110	The quantized geometry of visual space: The coherent computation of depth, form, and lightness. <i>Behavioral and Brain Sciences</i> , 1983 , 6, 625	0.9	209
109	How laminar frontal cortex and basal ganglia circuits interact to control planned and reactive saccades. <i>Neural Networks</i> , 2004 , 17, 471-510	9.1	208
108	Cortical dynamics of three-dimensional form, color, and brightness perception: I. Monocular theory. <i>Perception & Psychophysics</i> , 1987 , 41, 87-116		204
107	Normal and amnesic learning, recognition and memory by a neural model of cortico-hippocampal interactions. <i>Trends in Neurosciences</i> , 1993 , 16, 131-7	13.3	199
106	Neural dynamics of attentionally modulated Pavlovian conditioning: blocking, interstimulus interval, and secondary reinforcement. <i>Applied Optics</i> , 1987 , 26, 5015-30	1.7	193
105	Towards a theory of the laminar architecture of cerebral cortex: computational clues from the visual system. <i>Cerebral Cortex</i> , 2003 , 13, 100-13	5.1	182
104	On the development of feature detectors in the visual cortex with applications to learning and reaction-diffusion systems. <i>Biological Cybernetics</i> , 1976 , 21, 145-59	2.8	179
103	A neural model of how horizontal and interlaminar connections of visual cortex develop into adult circuits that carry out perceptual grouping and learning. <i>Cerebral Cortex</i> , 2001 , 11, 37-58	5.1	164
102	Cortical dynamics of three-dimensional figure-ground perception of two-dimensional pictures. <i>Psychological Review</i> , 1997 , 104, 618-58	6.3	159
101	Competition, decision, and consensus. <i>Journal of Mathematical Analysis and Applications</i> , 1978 , 66, 470-493		153
100	Neural dynamics of 3-D surface perception: figure-ground separation and lightness perception. <i>Perception & Psychophysics</i> , 2000 , 62, 1596-618		152
99	On learning and energy-entropy dependence in recurrent and nonrecurrent signed networks. <i>Journal of Statistical Physics</i> , 1969 , 1, 319-350	1.5	152
98	Context-sensitive binding by the laminar circuits of V1 and V2: A unified model of perceptual grouping, attention, and orientation contrast. <i>Visual Cognition</i> , 2001 , 8, 431-466	1.8	151
97	Some Networks that can Learn, Remember, and Reproduce any Number of Complicated Space-time. <i>Studies in Applied Mathematics</i> , 1970 , 49, 135-166	2.1	130
96	Spikes, synchrony, and attentive learning by laminar thalamocortical circuits. <i>Brain Research</i> , 2008 , 1218, 278-312	3.7	122

95	Neural pattern discrimination. <i>Journal of Theoretical Biology</i> , 1970 , 27, 291-337	2.3	122
94	A Theory of Human Memory: Self-Organization and Performance of Sensory-Motor Codes, Maps, and Plans 1978 , 233-374		122
93	A neural theory of punishment and avoidance, I: Qualitative theory. <i>Mathematical Biosciences</i> , 1972 , 15, 39-67	3.9	118
92	Neural dynamics of autistic behaviors: cognitive, emotional, and timing substrates. <i>Psychological Review</i> , 2006 , 113, 483-525	6.3	114
91	Laminar cortical dynamics of cognitive and motor working memory, sequence learning and performance: toward a unified theory of how the cerebral cortex works. <i>Psychological Review</i> , 2008 , 115, 677-732	6.3	107
90	On the serial learning of lists. <i>Mathematical Biosciences</i> , 1969 , 4, 201-253	3.9	103
89	Spiking threshold and overarousal effects in serial learning. <i>Journal of Statistical Physics</i> , 1971 , 3, 95-125	1.5	95
88	Laminar cortical dynamics of 3D surface perception: stratification, transparency, and neon color spreading. <i>Vision Research</i> , 2005 , 45, 1725-43	2.1	91
87	A neural model of how the brain represents and compares multi-digit numbers: spatial and categorical processes. <i>Neural Networks</i> , 2003 , 16, 1107-40	9.1	85
86	View-invariant object category learning, recognition, and search: how spatial and object attention are coordinated using surface-based attentional shrouds. <i>Cognitive Psychology</i> , 2009 , 58, 1-48	3.1	83
85	How does the cerebral cortex work? Development, learning, attention, and 3-D vision by laminar circuits of visual cortex. <i>Behavioral and Cognitive Neuroscience Reviews</i> , 2003 , 2, 47-76		83
84	Decisions, patterns, and oscillations in nonlinear competitive systems with applications to Volterra-Lotka systems. <i>Journal of Theoretical Biology</i> , 1978 , 73, 101-30	2.3	74
83	A neural model of surface perception: lightness, anchoring, and filling-in. <i>Spatial Vision</i> , 2006 , 19, 263-321		72
82	A laminar cortical model of stereopsis and 3D surface perception: closure and da Vinci stereopsis. <i>Spatial Vision</i> , 2005 , 18, 515-78		71
81	A laminar cortical model for 3D perception of slanted and curved surfaces and of 2D images: development, attention, and bistability. <i>Vision Research</i> , 2004 , 44, 1147-87	2.1	69
80	Probing cognitive processes through the structure of event-related potentials during learning: an experimental and theoretical analysis. <i>Applied Optics</i> , 1987 , 26, 4931-46	1.7	67
79	Laminar cortical dynamics of conscious speech perception: neural model of phonemic restoration using subsequent context in noise. <i>Journal of the Acoustical Society of America</i> , 2011 , 130, 440-60	2.2	65
78	Classical and Instrumental Learning by Neural Networks 1974 , 51-141		59

77	ARTSTREAM: a neural network model of auditory scene analysis and source segregation. <i>Neural Networks</i> , 2004 , 17, 511-36	9.1	58
76	Laminar development of receptive fields, maps and columns in visual cortex: the coordinating role of the subplate. <i>Cerebral Cortex</i> , 2003 , 13, 852-63	5.1	57
75	Towards solving the hard problem of consciousness: The varieties of brain resonances and the conscious experiences that they support. <i>Neural Networks</i> , 2017 , 87, 38-95	9.1	55
74	Dopaminergic and non-dopaminergic value systems in conditioning and outcome-specific reevaluation. <i>Brain Research</i> , 2008 , 1238, 239-87	3.7	54
73	Cortical and subcortical predictive dynamics and learning during perception, cognition, emotion and action. <i>Philosophical Transactions of the Royal Society B: Biological Sciences</i> , 2009 , 364, 1223-34	5.8	53
72	Neural dynamics of perceptual order and context effects for variable-rate speech syllables. <i>Perception & Psychophysics</i> , 1999 , 61, 1477-500		53
71	Texture segregation by visual cortex: perceptual grouping, attention, and learning. <i>Vision Research</i> , 2007 , 47, 3173-211	2.1	49
70	Temporal dynamics of decision-making during motion perception in the visual cortex. <i>Vision Research</i> , 2008 , 48, 1345-73	2.1	48
69	How do spatial learning and memory occur in the brain? Coordinated learning of entorhinal grid cells and hippocampal place cells. <i>Journal of Cognitive Neuroscience</i> , 2012 , 24, 1031-54	3.1	44
68	How does binocular rivalry emerge from cortical mechanisms of 3-D vision?. <i>Vision Research</i> , 2008 , 48, 2232-50	2.1	44
67	Computing with neural networks. <i>Science</i> , 1987 , 235, 1226-1227	33.3	42
66	Towards a unified theory of neocortex: laminar cortical circuits for vision and cognition. <i>Progress in Brain Research</i> , 2007 , 165, 79-104	2.9	39
65	How does the brain rapidly learn and reorganize view-invariant and position-invariant object representations in the inferotemporal cortex?. <i>Neural Networks</i> , 2011 , 24, 1050-61	9.1	36
64	ARTSCENE: A neural system for natural scene classification. <i>Journal of Vision</i> , 2009 , 9, 6.1-19	0.4	36
63	How entorhinal grid cells may learn multiple spatial scales from a dorsoventral gradient of cell response rates in a self-organizing map. <i>PLoS Computational Biology</i> , 2012 , 8, e1002648	5	36
62	Stereopsis and 3D surface perception by spiking neurons in laminar cortical circuits: a method for converting neural rate models into spiking models. <i>Neural Networks</i> , 2012 , 26, 75-98	9.1	34
61	Speaker normalization using cortical strip maps: a neural model for steady-state vowel categorization. <i>Journal of the Acoustical Society of America</i> , 2008 , 124, 3918-36	2.2	34
60	On learning, information, lateral inhibition, and transmitters. <i>Mathematical Biosciences</i> , 1969 , 4, 255-310	3.9	34

59	A prediction theory for some nonlinear functional-differential equations I. Learning of lists. <i>Journal of Mathematical Analysis and Applications</i> , 1968 , 21, 643-694	1.1	34
58	A neural model of sequential movement planning and control of eye movements: Item-Order-Rank working memory and saccade selection by the supplementary eye fields. <i>Neural Networks</i> , 2012 , 26, 29-58 ¹	9.1	33
57	Cortical dynamics of navigation and steering in natural scenes: Motion-based object segmentation, heading, and obstacle avoidance. <i>Neural Networks</i> , 2009 , 22, 1383-98	9.1	31
56	SOVEREIGN: An autonomous neural system for incrementally learning planned action sequences to navigate towards a rewarded goal. <i>Neural Networks</i> , 2008 , 21, 699-758	9.1	31
55	Some psychophysiological and pharmacological correlates of a developmental, cognitive and motivational theory. <i>Annals of the New York Academy of Sciences</i> , 1984 , 425, 58-151	6.5	31
54	Some Networks That Can Learn, Remember, and Reproduce any Number of Complicated Space-Time Patterns, I. <i>Indiana University Mathematics Journal</i> , 1969 , 19, 53-91	0.6	30
53	Where's Waldo? How perceptual, cognitive, and emotional brain processes cooperate during learning to categorize and find desired objects in a cluttered scene. <i>Frontiers in Integrative Neuroscience</i> , 2014 , 8, 43	3.2	28
52	Fast synchronization of perceptual grouping in laminar visual cortical circuits. <i>Neural Networks</i> , 2004 , 17, 707-18	9.1	27
51	Acetylcholine Neuromodulation in Normal and Abnormal Learning and Memory: Vigilance Control in Waking, Sleep, Autism, Amnesia and Alzheimer's Disease. <i>Frontiers in Neural Circuits</i> , 2017 , 11, 82	3.5	26
50	A Path Toward Explainable AI and Autonomous Adaptive Intelligence: Deep Learning, Adaptive Resonance, and Models of Perception, Emotion, and Action. <i>Frontiers in Neurobotics</i> , 2020 , 14, 36	3.4	23
49	How do children learn to follow gaze, share joint attention, imitate their teachers, and use tools during social interactions?. <i>Neural Networks</i> , 2010 , 23, 940-65	9.1	23
48	On the global limits and oscillations of a system of nonlinear differential equations describing a flow on a probabilistic network. <i>Journal of Differential Equations</i> , 1969 , 5, 531-563	2.1	23
47	Coordinated learning of grid cell and place cell spatial and temporal properties: multiple scales, attention and oscillations. <i>Philosophical Transactions of the Royal Society B: Biological Sciences</i> , 2014 , 369, 20120524	5.8	21
46	Running as fast as it can: how spiking dynamics form object groupings in the laminar circuits of visual cortex. <i>Journal of Computational Neuroscience</i> , 2010 , 28, 323-46	1.4	21
45	Four frames do not suffice. <i>Behavioral and Brain Sciences</i> , 1985 , 8, 294-295	0.9	20
44	A prediction theory for some nonlinear functional-differential equations. II. Learning of patterns. <i>Journal of Mathematical Analysis and Applications</i> , 1968 , 22, 490-522	1.1	20
43	From brain synapses to systems for learning and memory: Object recognition, spatial navigation, timed conditioning, and movement control. <i>Brain Research</i> , 2015 , 1621, 270-93	3.7	19
42	On the road to invariant recognition: explaining tradeoff and morph properties of cells in inferotemporal cortex using multiple-scale task-sensitive attentive learning. <i>Neural Networks</i> , 2011 , 24, 1036-49	9.1	19

41	Communication, Memory, and Development 1978 , 183-232		18
40	Binocular fusion and invariant category learning due to predictive remapping during scanning of a depthful scene with eye movements. <i>Frontiers in Psychology</i> , 2014 , 5, 1457	3-4	17
39	Birth of a learning law. <i>Neural Networks</i> , 1998 , 11, 1-7	9-1	17
38	Desirability, availability, credit assignment, category learning, and attention: Cognitive-emotional and working memory dynamics of orbitofrontal, ventrolateral, and dorsolateral prefrontal cortices. <i>Brain and Neuroscience Advances</i> , 2018 , 2, 2398212818772179	4	16
37	How visual illusions illuminate complementary brain processes: illusory depth from brightness and apparent motion of illusory contours. <i>Frontiers in Human Neuroscience</i> , 2014 , 8, 854	3-3	15
36	A neural model of normal and abnormal learning and memory consolidation: adaptively timed conditioning, hippocampus, amnesia, neurotrophins, and consciousness. <i>Cognitive, Affective and Behavioral Neuroscience</i> , 2017 , 17, 24-76	3-5	14
35	Real-time learning of predictive recognition categories that chunk sequences of items stored in working memory. <i>Frontiers in Psychology</i> , 2014 , 5, 1053	3-4	14
34	How do object reference frames and motion vector decomposition emerge in laminar cortical circuits?. <i>Attention, Perception, and Psychophysics</i> , 2011 , 73, 1147-70	2	13
33	Neural Dynamics of Autistic Repetitive Behaviors and Fragile X Syndrome: Basal Ganglia Movement Gating and mGluR-Modulated Adaptively Timed Learning. <i>Frontiers in Psychology</i> , 2018 , 9, 269	3-4	12
32	PATTERN LEARNING BY FUNCTIONAL-DIFFERENTIAL NEURAL NETWORKS WITH ARBITRARY PATH WEIGHTS 1972 , 121-160		12
31	How does the modular organization of entorhinal grid cells develop?. <i>Frontiers in Human Neuroscience</i> , 2014 , 8, 337	3-3	11
30	Direct perception or adaptive resonance?. <i>Behavioral and Brain Sciences</i> , 1980 , 3, 385-386	0-9	11
29	Neural Computation of Surface Border Ownership and Relative Surface Depth from Ambiguous Contrast Inputs. <i>Frontiers in Psychology</i> , 2016 , 7, 1102	3-4	11
28	Temporal dynamics of binocular disparity processing with corticogeniculate interactions. <i>Neural Networks</i> , 2002 , 15, 181-200	9-1	10
27	Joining distributed pattern processing and homeostatic plasticity in recurrent on-center off-surround shunting networks: noise, saturation, short-term memory, synaptic scaling, and BDNF. <i>Neural Networks</i> , 2012 , 25, 21-9	9-1	9
26	Associative and Competitive Principles of Learning and Development. <i>Lecture Notes in Biomathematics</i> , 1982 , 295-341		9
25	The resonant brain: How attentive conscious seeing regulates action sequences that interact with attentive cognitive learning, recognition, and prediction. <i>Attention, Perception, and Psychophysics</i> , 2019 , 81, 2237-2264	2	8
24	How Humans Consciously See Paintings and Paintings Illuminate How Humans See. <i>Art and Perception</i> , 2017 , 5, 1-95	0-7	7

23	Neural Dynamics of the Basal Ganglia During Perceptual, Cognitive, and Motor Learning and Gating. <i>Innovations in Cognitive Neuroscience</i> , 2016 , 457-512		7
22	Human and computer rules and representations are not equivalent. <i>Behavioral and Brain Sciences</i> , 1980 , 3, 136-138	0.9	7
21	Learning and energy-entropy dependence in some nonlinear functional-differential systems. <i>Bulletin of the American Mathematical Society</i> , 1969 , 75, 1238-1243		7
20	The Embodied Brain of SOVEREIGN2: From Space-Variant Conscious Percepts During Visual Search and Navigation to Learning Invariant Object Categories and Cognitive-Emotional Plans for Acquiring Valued Goals. <i>Frontiers in Computational Neuroscience</i> , 2019 , 13, 36	3.5	6
19	Phoneme restoration and empirical coverage of Interactive Activation and Adaptive Resonance models of human speech processing. <i>Journal of the Acoustical Society of America</i> , 2016 , 140, 1130	2.2	6
18	Neuroethology and theoretical neurobiology. <i>Behavioral and Brain Sciences</i> , 1984 , 7, 388-390	0.9	5
17	The art of seeing and painting. <i>Spatial Vision</i> , 2008 , 21, 463-86		4
16	Developmental Designs and Adult Functions of Cortical Maps in Multiple Modalities: Perception, Attention, Navigation, Numbers, Streaming, Speech, and Cognition. <i>Frontiers in Neuroinformatics</i> , 2020 , 14, 4	3.9	3
15	Grandmother cohorts: multiple-scale brain compression dynamics during learning of object and sequence categories. <i>Language, Cognition and Neuroscience</i> , 2017 , 32, 295-315	2.4	2
14	How the venetian blind percept emerges from the laminar cortical dynamics of 3D vision. <i>Frontiers in Psychology</i> , 2014 , 5, 694	3.4	2
13	A bio-inspired kinematic controller for obstacle avoidance during reaching tasks with redundant robots 2008 ,		2
12	Cognitive self-organization and neural modularity. <i>Behavioral and Brain Sciences</i> , 1985 , 8, 18-19	0.9	2
11	The role of learning in sensory-motor control. <i>Behavioral and Brain Sciences</i> , 1985 , 8, 155-157	0.9	2
10	A Laminar Cortical Model for 3D Boundary and Surface Representations of Complex Natural Scenes 2019 , 509-546		2
9	Toward Autonomous Adaptive Intelligence: Building Upon Neural Models of How Brains Make Minds. <i>IEEE Transactions on Systems, Man, and Cybernetics: Systems</i> , 2021 , 51, 51-75	7.3	2
8	Attention: Multiple types, brain resonances, psychological functions, and conscious states. <i>Journal of Integrative Neuroscience</i> , 2021 , 20, 197-232	1.5	2
7	A Unified Neural Theory of Conscious Seeing, Hearing, Feeling, and Knowing. <i>Cognitive Neuroscience</i> , 2021 , 12, 69-73	1.7	1
6	A Canonical Laminar Neocortical Circuit Whose Bottom-Up, Horizontal, and Top-Down Pathways Control Attention, Learning, and Prediction. <i>Frontiers in Systems Neuroscience</i> , 2021 , 15, 650263	3.5	0

- 5 A Neural Model of Intrinsic and Extrinsic Hippocampal Theta Rhythms: Anatomy, Neurophysiology, and Function. *Frontiers in Systems Neuroscience*, **2021**, 15, 665052 3.5 0
- 4 Interdisciplinary aspects of perceptual dynamics. *Behavioral and Brain Sciences*, **1983**, 6, 676 0.9
- 3 The microscopic analysis of behavior: Toward a synthesis of instrumental, perceptual, and cognitive ideas. *Behavioral and Brain Sciences*, **1984**, 7, 594-595 0.9
- 2 Toward Understanding the Brain Dynamics of Music: Learning and Conscious Performance of Lyrics and Melodies With Variable Rhythms and Beats.. *Frontiers in Systems Neuroscience*, **2022**, 16, 766239 3.5
- 1 STATISTICAL MECHANICS OF VISUAL FORM PERCEPTION: THE RESOLUTION OF UNCERTAINTY **1986**, 201-221