Rafal Bogacz

List of Publications by Year
in descending order

79 papers	7,443 citations	109137 35 h-index	76769 74 g-index
100 all docs	100 docs citations	100 times ranked	6390 citing authors

#	Article	IF	Citations
1	The physics of optimal decision making: A formal analysis of models of performance in two-alternative forced-choice tasks.. Psychological Review, 2006, 113, 700-765.	2.7	1,426
2	The neural basis of the speedâ€"accuracy tradeoff. Trends in Neurosciences, 2010, 33, 10-16.	4.2	574
3	A deep learning framework for neuroscience. Nature Neuroscience, 2019, 22, 1761-1770.	7.1	563
4	The Basal Ganglia and Cortex Implement Optimal Decision Making Between Alternative Actions. Neural Computation, 2007, 19, 442-477.	1.3	338
5	Cortico-striatal connections predict control over speed and accuracy in perceptual decision making. Proceedings of the National Academy of Sciences of the United States of America, 2010, 107, 15916-15920.	3.3	332
6	Optimal decision-making theories: linking neurobiology with behaviour. Trends in Cognitive Sciences, 2007, 11, 118-125.	4.0	317
7	Theories of Error Back-Propagation in the Brain. Trends in Cognitive Sciences, 2019, 23, 235-250.	4.0	247
8	Conditions for the Generation of Beta Oscillations in the Subthalamic Nucleusâ€"Globus Pallidus Network. Journal of Neuroscience, 2010, 30, 12340-12352.	1.7	232
9	On optimal decision-making in brains and social insect colonies. Journal of the Royal Society Interface, 2009, 6, 1065-1074.	1.5	202
10	A tutorial on the free-energy framework for modelling perception and learning. Journal of Mathematical Psychology, 2017, 76, 198-211.	1.0	178
11	Action initiation shapes mesolimbic dopamine encoding of future rewards. Nature Neuroscience, 2016, 19, 34-36.	7.1	177
12	Extending a biologically inspired model of choice: multi-alternatives, nonlinearity and value-based multidimensional choice. Philosophical Transactions of the Royal Society B: Biological Sciences, 2007, 362, 1655-1670.	1.8	161
13	Computational Models Describing Possible Mechanisms for Generation of Excessive Beta Oscillations in Parkinsonâ€™s Disease. PLoS Computational Biology, 2015, 11, e1004609.	1.5	133
14	Distinct Developmental Origins Manifest in the Specialized Encoding of Movement by Adult Neurons of the External Globus Pallidus. Neuron, 2015, 86, 501-513.	3.8	127
15	Neural Correlates of Decision Thresholds in the Human Subthalamic Nucleus. Current Biology, 2016, 26, 916-920.	1.8	127
16	An Approximation of the Error Backpropagation Algorithm in a Predictive Coding Network with Local Hebbian Synaptic Plasticity. Neural Computation, 2017, 29, 1229-1262.	1.3	117
17	Quantifying phaseâ€"amplitude coupling in neuronal network oscillations. Progress in Biophysics and Molecular Biology, 2011, 105, 49-57.	1.4	116
18	Comparison of computational models of familiarity discrimination in the perirhinal cortex. Hippocampus, 2003, 13, 494-524.	0.9	106

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19	Mammalian choices: combining fast-but-inaccurate and slow-but-accurate decision-making systems. Proceedings of the Royal Society B: Biological Sciences, 2008, 275, 2353-2361.	1.2	105
20	Effective connectivity of the subthalamic nucleusâ€“globus pallidus network during Parkinsonian oscillations. Journal of Physiology, 2014, 592, 1429-1455.	1.3	84
21	Model of familiarity discrimination in the perirhinal cortex. Journal of Computational Neuroscience, 2001, 10, 5-23.	0.6	81
22	SIMPLE NEURAL NETWORKS THAT OPTIMIZE DECISIONS. International Journal of Bifurcation and Chaos in Applied Sciences and Engineering, 2005, 15, 803-826.	0.7	81
23	Improved conditions for the generation of beta oscillations in the subthalamic nucleusâ€“globus pallidus network. European Journal of Neuroscience, 2012, 36, 2229-2239.	1.2	75
24	Learning Reward Uncertainty in the Basal Ganglia. PLoS Computational Biology, 2016, 12, e1005062.	1.5	74
25	Distinct roles of dopamine and subthalamic nucleus in learning and probabilistic decision making. Brain, 2012, 135, 3721-3734.	3.7	73
26	Integration of Reinforcement Learning and Optimal Decision-Making Theories of the Basal Ganglia. Neural Computation, 2011, 23, 817-851.	1.3	72
27	A Canonical Circuit for Generating Phase-Amplitude Coupling. PLoS ONE, 2014, 9, e102591.	1.1	68
28	Reduction of Influence of Task Difficulty on Perceptual Decision Making by STN Deep Brain Stimulation. Current Biology, 2013, 23, 1681-1684.	1.8	66
29	Mechanisms Underlying Decision-Making as Revealed by Deep-Brain Stimulation in Patients with Parkinsonâ€™s Disease. Current Biology, 2018, 28, 1169-1178.e6.	1.8	66
30	Short-term memory traces for action bias in human reinforcement learning. Brain Research, 2007, 1153, 111-121.	1.1	65
31	Neural signatures of hyperdirect pathway activity in Parkinsonâ€™s disease. Nature Communications, 2021, 12, 5185.	5.8	65
32	Dysfunctional Prefrontal Cortical Network Activity and Interactions following Cannabinoid Receptor Activation. Journal of Neuroscience, 2011, 31, 15560-15568.	1.7	58
33	Dendritic Integration of Sensory Evidence in Perceptual Decision-Making. Cell, 2018, 173, 894-905.e13.	13.5	55
34	Effects of dopamine on reinforcement learning and consolidation in Parkinsonâ€™s disease. ELife, 2017, 6, .	2.8	52
35	Time-varying decision boundaries: insights from optimality analysis. Psychonomic Bulletin and Review, 2018, 25, 971-996.	1.4	52
36	Toward a Science of Learning Games. Mind, Brain, and Education, 2011, 5, 33-41.	0.9	42

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37	Predicting the effects of deep brain stimulation using a reduced coupled oscillator model. PLoS Computational Biology, 2019, 15, e1006575.	1.5	41
38	Overcoming indecision by changing the decision boundary.. Journal of Experimental Psychology: General, 2017, 146, 776-805.	1.5	38
39	Dopamine role in learning and action inference. ELife, 2020, 9, .	2.8	34
40	The subthalamic nucleus during decisionâ€•making with multiple alternatives. Human Brain Mapping, 2015, 36, 4041-4052.	1.9	31
41	Properties of Neurons in External Globus Pallidus Can Support Optimal Action Selection. PLoS Computational Biology, 2016, 12, e1005004.	1.5	30
42	Average beta burst duration profiles provide a signature of dynamical changes between the ON and OFF medication states in Parkinsonâ€™s disease. PLoS Computational Biology, 2021, 17, e1009116.	1.5	28
43	Case Report: Embedding â€œDigital Chronotherapyâ€•Into Medical Devicesâ€"A Canine Validation for Controlling Status Epilepticus Through Multi-Scale Rhythmic Brain Stimulation. Frontiers in Neuroscience, 2021, 15, 734265.	1.4	28
44	The neural mechanisms of learning from competitors. NeuroImage, 2010, 53, 790-799.	2.1	27
45	An Infomax Algorithm Can Perform Both Familiarity Discrimination and Feature Extraction in a Single Network. Neural Computation, 2011, 23, 909-926.	1.3	27
46	Phase-dependence of response curves to deep brain stimulation and their relationship: from essential tremor patient data to a Wilsonâ€"Cowan model. Journal of Mathematical Neuroscience, 2020, 10, 4.	2.4	27
47	Learning the payoffs and costs of actions. PLoS Computational Biology, 2019, 15, e1006285.	1.5	26
48	Optimal Decision Making on the Basis of Evidence Represented in Spike Trains. Neural Computation, 2010, 22, 1113-1148.	1.3	25
49	Deep Brain Stimulation Abolishes Slowing of Reactions to Unlikely Stimuli. Journal of Neuroscience, 2014, 34, 10844-10852.	1.7	22
50	Dopamine and Consolidation of Episodic Memory: Timing Is Everything. Journal of Cognitive Neuroscience, 2015, 27, 2035-2050.	1.1	21
51	Adaptive Sampling of Information in Perceptual Decision-Making. PLoS ONE, 2013, 8, e78993.	1.1	18
52	Predicting beta bursts from local field potentials to improve closed-loop DBS paradigms in Parkinsonâ€™s patients. , 2018, 2018, 3766-3796.		18
53	Computational models can replicate the capacity of human recognition memory. Network: Computation in Neural Systems, 2008, 19, 161-182.	2.2	17
54	A comparison of bounded diffusion models for choice in time controlled tasks. Journal of Mathematical Psychology, 2009, 53, 231-241.	1.0	17

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55	Neuroscience: Impaired Decision-Making in Parkinsonâ€™s Disease. Current Biology, 2016, 26, R671-R673.	1.8	17
56	A Normative Account of Confirmation Bias During Reinforcement Learning. Neural Computation, 2022, 34, 307-337.	1.3	17
57	Learning to use working memory: a reinforcement learning gating model of rule acquisition in rats. Frontiers in Computational Neuroscience, 2012, 6, 87.	1.2	16
58	Modeling the effects of motivation on choice and learning in the basal ganglia. PLoS Computational Biology, 2020, 16, e1007465.	1.5	16
59	The restricted influence of sparseness of coding on the capacity of familiarity discrimination networks. Network: Computation in Neural Systems, 2002, 13, 457-485.	2.2	14
60	Bounded Ornsteinâ€"Uhlenbeck models for two-choice time controlled tasks. Journal of Mathematical Psychology, 2010, 54, 322-333.	1.0	14
61	Posterior Weighted Reinforcement Learning with State Uncertainty. Neural Computation, 2010, 22, 1149-1179.	1.3	13
62	Optimal closed-loop deep brain stimulation using multiple independently controlled contacts. PLoS Computational Biology, 2021, 17, e1009281.	1.5	13
63	An association between prediction errors and risk-seeking: Theory and behavioral evidence. PLoS Computational Biology, 2021, 17, e1009213.	1.5	11
64	Selective Effects of the Loss of NMDA or mGluR5 Receptors in the Reward System on Adaptive Decision-Making. ENeuro, 2018, 5, ENEURO.0331-18.2018.	0.9	11
65	Optimal decision network with distributed representation. Neural Networks, 2007, 20, 564-576.	3.3	9
66	Optimizing deep brain stimulation based on isostable amplitude in essential tremor patient models. Journal of Neural Engineering, 2021, 18, 046023.	1.8	9
67	Predictive Coding: Towards a Future of Deep Learning beyond Backpropagation?. , 2022, , .		8
68	Deep Brain Stimulation of the Subthalamic Nucleus Does Not Affect the Decrease of Decision Threshold during the Choice Process When There Is No Conflict, Time Pressure, or Reward. Journal of Cognitive Neuroscience, 2018, 30, 876-884.	1.1	7
69	The restricted influence of sparseness of coding on the capacity of familiarity discrimination networks. , 0, .		7
70	Computational modeling and analysis of hippocampal-prefrontal information coding during a spatial decision-making task. Frontiers in Behavioral Neuroscience, 2014, 8, 62.	1.0	6
71	Bifurcation analysis points towards the source of beta neuronal oscillations in Parkinson's disease. , 2011, , .		5
72	Can the Brain Do Backpropagation? -Exact Implementation of Backpropagation in Predictive Coding Networks. Advances in Neural Information Processing Systems, 2020, 33, 22566-22579.	2.8	5

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73	PAX-D: study protocol for a randomised placebo-controlled trial evaluating the efficacy and mechanism of pramipexole as add-on treatment for people with treatment resistant depression. Evidence-Based Mental Health, 2022, 25, 77-83.	2.2	4
74	Uncertaintyâ€“guided learning with scaled prediction errors in the basal ganglia. PLoS Computational Biology, 2022, 18, e1009816.	1.5	4
75	Hunger improves reinforcement-driven but not planned action. Cognitive, Affective and Behavioral Neuroscience, 2021, 21, 1196-1206.	1.0	3
76	Neural Circuits Trained with Standard Reinforcement Learning Can Accumulate Probabilistic Information during Decision Making. Neural Computation, 2017, 29, 368-393.	1.3	2
77	The restricted influence of sparseness of coding on the capacity of familiarity discrimination networks. Network: Computation in Neural Systems, 2002, 13, 457-85.	2.2	2
78	Conflict Detection in a Sequential Decision Task Is Associated with Increased Cortico-Subthalamic Coherence and Prolonged Subthalamic Oscillatory Response in the Î² Band. Journal of Neuroscience, 2022, 42, 4681-4692.	1.7	2
79	THE PHYSICS OF DECISION MAKING: STOCHASTIC DIFFERENTIAL EQUATIONS AS MODELS FOR NEURAL DYNAMICS AND EVIDENCE ACCUMULATION IN CORTICAL CIRCUITS. , 2010, , .		1