Wolfram Schultz

List of Publications by Year
in descending order

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120 papers	32,788 citations	21215 62 h-index	25230 113 g-index
178 all docs	178 docs citations	178 times ranked	20505 citing authors

#	Article	IF	Citations
1	Predictive Reward Signal of Dopamine Neurons. Journal of Neurophysiology, 1998, 80, 1-27.	0.9	4,219
2	Getting Formal with Dopamine and Reward. Neuron, 2002, 36, 241-263.	3.8	2,180
3	Discrete Coding of Reward Probability and Uncertainty by Dopamine Neurons. Science, 2003, 299, 1898-1902.	6.0	1,737
4	Behavioral Theories and the Neurophysiology of Reward. Annual Review of Psychology, 2006, 57, 87-115.	9.9	1,381
5	Neuronal Coding of Prediction Errors. Annual Review of Neuroscience, 2000, 23, 473-500.	5.0	1,329
6	Relative reward preference in primate orbitofrontal cortex. Nature, 1999, 398, 704-708.	13.7	1,198
7	Multiple reward signals in the brain. Nature Reviews Neuroscience, 2000, 1, 199-207.	4.9	1,176
8	Behavioral dopamine signals. Trends in Neurosciences, 2007, 30, 203-210.	4.2	1,163
9	Multiple Dopamine Functions at Different Time Courses. Annual Review of Neuroscience, 2007, 30, 259-288.	5.0	1,153
10	Adaptive Coding of Reward Value by Dopamine Neurons. Science, 2005, 307, 1642-1645.	6.0	1,085
11	Preferential activation of midbrain dopamine neurons by appetitive rather than aversive stimuli. Nature, 1996, 379, 449-451.	13.7	1,047
12	Dopamine responses comply with basic assumptions of formal learning theory. Nature, 2001, 412, 43-48.	13.7	1,044
13	Dopamine neurons report an error in the temporal prediction of reward during learning. Nature Neuroscience, 1998, 1, 304-309.	7.1	946
14	Neuronal Reward and Decision Signals: From Theories to Data. Physiological Reviews, 2015, 95, 853-951.	13.1	800
15	Dissociating the Role of the Orbitofrontal Cortex and the Striatum in the Computation of Goal Values and Prediction Errors. Journal of Neuroscience, 2008, 28, 5623-5630.	1.7	709
16	Dopamine reward prediction-error signalling: a two-component response. Nature Reviews Neuroscience, 2016, 17, 183-195.	4.9	672
17	Updating dopamine reward signals. Current Opinion in Neurobiology, 2013, 23, 229-238.	2.0	525
18	Dopamine signals for reward value and risk: basic and recent data. Behavioral and Brain Functions, 2010, 6, 24.	1.4	519

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19	Neural coding of basic reward terms of animal learning theory, game theory, microeconomics and behavioural ecology. Current Opinion in Neurobiology, 2004, 14, 139-147.	2.0	452
20	Reward Value Coding Distinct From Risk Attitude-Related Uncertainty Coding in Human Reward Systems. Journal of Neurophysiology, 2007, 97, 1621-1632.	0.9	418
21	Influence of Reward Delays on Responses of Dopamine Neurons. Journal of Neuroscience, 2008, 28, 7837-7846.	1.7	356
22	Influence of Reward Expectation on Behavior-Related Neuronal Activity in Primate Striatum. Journal of Neurophysiology, 1998, 80, 947-963.	0.9	345
23	Effects of Expectations for Different Reward Magnitudes on Neuronal Activity in Primate Striatum. Journal of Neurophysiology, 2003, 89, 2823-2838.	0.9	301
24	Coding of Predicted Reward Omission by Dopamine Neurons in a Conditioned Inhibition Paradigm. Journal of Neuroscience, 2003, 23, 10402-10410.	1.7	298
25	The temporal precision of reward prediction in dopamine neurons. Nature Neuroscience, 2008, 11, 966-973.	7.1	268
26	Neural mechanisms of observational learning. Proceedings of the National Academy of Sciences of the United States of America, 2010, 107, 14431-14436.	3.3	268
27	Role of primate basal ganglia and frontal cortex in the internal generation of movements. Experimental Brain Research, 1992, 91, 396-407.	0.7	256
28	Modifications of Reward Expectation-Related Neuronal Activity During Learning in Primate Striatum. Journal of Neurophysiology, 1998, 80, 964-977.	0.9	253
29	Reward-Related Neuronal Activity During Go-Nogo Task Performance in Primate Orbitofrontal Cortex. Journal of Neurophysiology, 2000, 83, 1864-1876.	0.9	245
30	The role of the striatum in social behavior. Frontiers in Neuroscience, 2013, 7, 233.	1.4	238
31	Influence of Expectation of Different Rewards on Behavior-Related Neuronal Activity in the Striatum. Journal of Neurophysiology, 2001, 85, 2477-2489.	0.9	222
32	Dopamine Neuron-Specific Optogenetic Stimulation in Rhesus Macaques. Cell, 2016, 166, 1564-1571.e6.	13.5	219
33	Coding of Reward Risk by Orbitofrontal Neurons IsÂMostly Distinct from Coding of Reward Value. Neuron, 2010, 68, 789-800.	3.8	213
34	Changes in behavior-related neuronal activity in the striatum during learning. Trends in Neurosciences, 2003, 26, 321-328.	4.2	210
35	Depletion of dopamine in the striatum as an experimental model of parkinsonism: direct effects and adaptive mechanisms. Progress in Neurobiology, 1982, 18, 121-166.	2.8	205
36	Dopamine prediction error responses integrate subjective value from different reward dimensions. Proceedings of the National Academy of Sciences of the United States of America, 2014, 111, 2343-2348.	3.3	202

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37	Explicit neural signals reflecting reward uncertainty. Philosophical Transactions of the Royal Society B: Biological Sciences, 2008, 363, 3801-3811.	1.8	199
38	Potential Vulnerabilities of Neuronal Reward, Risk, and Decision Mechanisms to Addictive Drugs. Neuron, 2011, 69, 603-617.	3.8	188
39	Role of primate basal ganglia and frontal cortex in the internal generation of movements. Experimental Brain Research, 1992, 91, 363-84.	0.7	184
40	Dopamine Reward Prediction Error Responses Reflect Marginal Utility. Current Biology, 2014, 24, 2491-2500.	1.8	170
41	Risk-dependent reward value signal in human prefrontal cortex. Proceedings of the National Academy of Sciences of the United States of America, 2009, 106, 7185-7190.	3.3	160
42	Reward functions of the basal ganglia. Journal of Neural Transmission, 2016, 123, 679-693.	1.4	160
43	Adaptation of Reward Sensitivity in Orbitofrontal Neurons. Journal of Neuroscience, 2010, 30, 534-544.	1.7	153
44	Activity of dopamine neurons in the behaving primate. Seminars in Neuroscience, 1992, 4, 129-138.	2.3	146
45	Temporally Extended Dopamine Responses to Perceptually Demanding Reward-Predictive Stimuli. Journal of Neuroscience, 2010, 30, 10692-10702.	1.7	145
46	Modifications of Reward Expectation-Related Neuronal Activity During Learning in Primate Orbitofrontal Cortex. Journal of Neurophysiology, 2000, 83, 1877-1885.	0.9	144
47	Temporal Difference Model Reproduces Anticipatory Neural Activity. Neural Computation, 2001, 13, 841-862.	1.3	138
48	The phasic dopamine signal maturing: from reward via behavioural activation to formal economic utility. Current Opinion in Neurobiology, 2017, 43, 139-148.	2.0	130
49	Responses of monkey midbrain dopamine neurons during delayed alternation performance. Brain Research, 1991, 567, 337-341.	1.1	115
50	Relative reward processing in primate striatum. Experimental Brain Research, 2005, 162, 520-525.	0.7	111
51	Behavioral reactions reflecting differential reward expectations in monkeys. Experimental Brain Research, 2001, 140, 511-518.	0.7	108
52	Retroactive modulation of spike timing-dependent plasticity by dopamine. ELife, 2015, 4, .	2.8	94
53	Chapter 15 Reward-related activity in the monkey striatum and substantia nigra. Progress in Brain Research, 1993, 99, 227-235.	0.9	91
54	Dopamine Modulates Adaptive Prediction Error Coding in the Human Midbrain and Striatum. Journal of Neuroscience, 2017, 37, 1708-1720.	1.7	91

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55	Reward prediction error. Current Biology, 2017, 27, R369-R371.	1.8	91
56	Short-Term Temporal Discounting of Reward Value in Human Ventral Striatum. Journal of Neurophysiology, 2009, 101, 1507-1523.	0.9	85
57	Neuronal Distortions of Reward Probability without Choice. Journal of Neuroscience, 2008, 28, 11703-11711.	1.7	83
58	Adaptive Prediction Error Coding in the Human Midbrain and Striatum Facilitates Behavioral Adaptation and Learning Efficiency. Neuron, 2016, 90, 1127-1138.	3.8	82
59	Reward Magnitude Coding in Primate Amygdala Neurons. Journal of Neurophysiology, 2010, 104, 3424-3432.	0.9	81
60	An Open Resource for Non-human Primate Optogenetics. Neuron, 2020, 108, 1075-1090.e6.	3.8	79
61	A predictive reinforcement model of dopamine neurons for learning approach behavior. , 1999, 6, 191-214.		78
62	Learning-Related Human Brain Activations Reflecting Individual Finances. Neuron, 2007, 54, 167-175.	3.8	78
63	Primate Amygdala Neurons Simulate Decision Processes of Social Partners. Cell, 2019, 177, 986-998.e15.	13.5	75
64	Sequential neuromodulation of Hebbian plasticity offers mechanism for effective reward-based navigation. ELife, 2017, 6, .	2.8	74
65	Prediction of economic choice by primate amygdala neurons. Proceedings of the National Academy of Sciences of the United States of America, 2012, 109, 18950-18955.	3.3	73
66	Dopamine neurons learn relative chosen value from probabilistic rewards. ELife, 2016, 5, .	2.8	70
67	Phasic dopamine signals: from subjective reward value to formal economic utility. Current Opinion in Behavioral Sciences, 2015, 5, 147-154.	2.0	69
68	Economic Choices Reveal Probability Distortion in Macaque Monkeys. Journal of Neuroscience, 2015, 35, 3146-3154.	1.7	69
69	Recent advances in understanding the role of phasic dopamine activity. F1000Research, 2019, 8, 1680.	0.8	68
70	Activity of striatal neurons reflects social action and own reward. Proceedings of the National Academy of Sciences of the United States of America, 2013, 110, 16634-16639.	3.3	66
71	A dynamic code for economic object valuation in prefrontal cortex neurons. Nature Communications, 2016, 7, 12554.	5.8	63
72	Evidence that the delay-period activity of dopamine neurons corresponds to reward uncertainty rather than backpropagating TD errors. Behavioral and Brain Functions, 2005, 1, 7.	1.4	62

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73	Refinement of the use of food and fluid control as motivational tools for macaques used in behavioural neuroscience research: Report of a Working Group of the NC3Rs. Journal of Neuroscience Methods, 2010, 193, 167-188.	1.3	60
74	Subjective neuronal coding of reward: temporal value discounting and risk. European Journal of Neuroscience, 2010, 31, 2124-2135.	1.2	58
75	Scaling prediction errors to reward variability benefits error-driven learning in humans. Journal of Neurophysiology, 2015, 114, 1628-1640.	0.9	57
76	Reward Contexts Extend Dopamine Signals to Unrewarded Stimuli. Current Biology, 2014, 24, 56-62.	1.8	48
77	Components and characteristics of the dopamine reward utility signal. Journal of Comparative Neurology, 2016, 524, 1699-1711.	0.9	48
78	Utility functions predict variance and skewness risk preferences in monkeys. Proceedings of the National Academy of Sciences of the United States of America, 2016, 113, 8402-8407.	3.3	45
79	Orbitofrontal signals for two-component choice options comply with indifference curves of Revealed Preference Theory. Nature Communications, 2019, 10, 4885.	5.8	44
80	Rewarding properties of visual stimuli. Experimental Brain Research, 2006, 168, 541-546.	0.7	42
81	Responses of Amygdala Neurons to Positive Reward-Predicting Stimuli Depend on Background Reward (Contingency) Rather Than Stimulus-Reward Pairing (Contiguity). Journal of Neurophysiology, 2010, 103, 1158-1170.	0.9	42
82	Monitoring extracellular pH, oxygen, and dopamine during reward delivery in the striatum of primates. Frontiers in Behavioral Neuroscience, 2012, 6, 36.	1.0	41
83	Dopamine Modulates the Neural Representation of Subjective Value of Food in Hungry Subjects. Journal of Neuroscience, 2014, 34, 16856-16864.	1.7	40
84	Planning activity for internally generated reward goals in monkey amygdala neurons. Nature Neuroscience, 2015, 18, 461-469.	7.1	39
85	Partial Adaptation of Obtained and Observed Value Signals Preserves Information about Gains and Losses. Journal of Neuroscience, 2016, 36, 10016-10025.	1.7	35
86	Sensitivity to Temporal Reward Structure in Amygdala Neurons. Current Biology, 2012, 22, 1839-1844.	1.8	34
87	Monkeys choose as if maximizing utility compatible with basic principles of revealed preference theory. Proceedings of the National Academy of Sciences of the United States of America, 2017, 114, E1766-E1775.	3.3	33
88	Neuronal signals for reward risk in frontal cortex. Annals of the New York Academy of Sciences, 2011, 1239, 109-117.	1.8	31
89	Probability Distortion Depends on Choice Sequence in Rhesus Monkeys. Journal of Neuroscience, 2019, 39, 2915-2929.	1.7	28
90	Neural Basis for Economic Saving Strategies in Human Amygdala-Prefrontal Reward Circuits. Current Biology, 2016, 26, 3004-3013.	1.8	25

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91	Continued need for non-human primate neuroscience research. Current Biology, 2018, 28, R1186-R1187.	1.8	25
92	A neuronal reward inequity signal in primate striatum. Journal of Neurophysiology, 2016, 115, 68-79.	0.9	23
93	Introduction. Neuroeconomics: the promise and the profit. Philosophical Transactions of the Royal Society B: Biological Sciences, 2008, 363, 3767-3769.	1.8	22
94	Risk Prediction Error Coding in Orbitofrontal Neurons. Journal of Neuroscience, 2013, 33, 15810-15814.	1.7	21
95	Midbrain Dopamine Neurons. , 2009, , 321-329.		20
96	Primate amygdala neurons evaluate the progress of self-defined economic choice sequences. ELife, 2016, 5, .	2.8	17
97	Neural encoding of choice during a delayed response task in primate striatum and orbitofrontal cortex. Experimental Brain Research, 2018, 236, 1679-1688.	0.7	16
98	Performance error-related activity in monkey striatum during social interactions. Scientific Reports, 2016, 6, 37199.	1.6	14
99	Reward-specific satiety affects subjective value signals in orbitofrontal cortex during multicomponent economic choice. Proceedings of the National Academy of Sciences of the United States of America, 2021, 118, .	3.3	14
100	Primate prefrontal neurons signal economic risk derived from the statistics of recent reward experience. ELife, 2019, 8, .	2.8	14
101	Predictive coding of the statistical parameters of uncertain rewards by orbitofrontal neurons. Behavioural Brain Research, 2018, 355, 90-94.	1.2	13
102	Nonhuman Primates Satisfy Utility Maximization in Compliance with the Continuity Axiom of Expected Utility Theory. Journal of Neuroscience, 2021, 41, 2964-2979.	1.7	13
103	Functions of primate amygdala neurons in economic decisions and social decision simulation. Behavioural Brain Research, 2021, 409, 113318.	1.2	13
104	Economic risk coding by single neurons in the orbitofrontal cortex. Journal of Physiology (Paris), 2015, 109, 70-77.	2.1	11
105	Single-Dimensional Human Brain Signals for Two-Dimensional Economic Choice Options. Journal of Neuroscience, 2021, 41, 3000-3013.	1.7	9
106	Risky Dopamine. Biological Psychiatry, 2012, 71, 180-181.	0.7	8
107	Retrospective Valuation of Experienced Outcome Encoded in Distinct Reward Representations in the Anterior Insula and Amygdala. Journal of Neuroscience, 2020, 40, 8938-8950.	1.7	8
108	Neural activity in human ventromedial prefrontal cortex reflecting the intention to save reward. Social Cognitive and Affective Neuroscience, 2019, 14, 1255-1261.	1.5	6

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109	Adaptation of utility functions to reward distribution in rhesus monkeys. Cognition, 2021, 214, 104764.	1.1	6
110	Comparing utility functions between risky and riskless choice in rhesus monkeys. Animal Cognition, 2022, 25, 385-399.	0.9	5
111	Experimentally revealed stochastic preferences for multicomponent choice options.. Journal of Experimental Psychology Animal Learning and Cognition, 2020, 46, 367-384.	0.3	5
112	Choice mechanisms for past, temporally extended outcomes. Proceedings of the Royal Society B: Biological Sciences, 2015, 282, 20141766.	1.2	3
113	Reward Value Revealed by Auction in Rhesus Monkeys. Journal of Neuroscience, 2022, 42, 1510-1528.	1.7	3
114	Comparing Utility Functions Between Risky and Riskless Choice in Rhesus Monkeys. SSRN Electronic Journal, 0, , .	0.4	2
115	Smarter than humans: rationality reflected in primate neuronal reward signals. Current Opinion in Behavioral Sciences, 2021, 41, 50-56.	2.0	2
116	Neuronal Risk Processing in Human and Monkey Prefrontal Cortex. , 2017, , 103-131.		1
117	Experimentally Revealed Stochastic Preferences for Multi-Component Choice Options. SSRN Electronic Journal, 0, , .	0.4	1
118	Pointing with focussing devices. Behavioral and Brain Sciences, 1997, 20, 755-756.	0.4	0
119	Scalar Human Brain Responses to Vectorial Economic Choice Options: A Concept-Driven Approach. SSRN Electronic Journal, 0, , .	0.4	0
120	Reduced Neuronal Value Signals in Monkey Orbitofrontal Cortex during Relative Reward-Specific Satiety of Two-Component Choice Options. SSRN Electronic Journal, 0, , .	0.4	0