MÃ¡tÃ© Lengyel

List of Publications by Year
in descending order

124 papers	22,977 citations	38660 50 h-index	20307 116 g-index
139 all docs	139 docs citations	139 times ranked	14106 citing authors

#	Article	IF	Citations
1	Noise in the nervous system. Nature Reviews Neuroscience, 2008, 9, 292-303.	4.9	2,230
2	Signal-dependent noise determines motor planning. Nature, 1998, 394, 780-784.	13.7	2,197
3	Computational principles of movement neuroscience. Nature Neuroscience, 2000, 3, 1212-1217.	7.1	1,709
4	Bayesian integration in sensorimotor learning. Nature, 2004, 427, 244-247.	13.7	1,688
5	Central cancellation of self-produced tickle sensation. Nature Neuroscience, 1998, 1, 635-640.	7.1	1,195
6	Principles of sensorimotor learning. Nature Reviews Neuroscience, 2011, 12, 739-751.	4.9	1,161
7	A unifying computational framework for motor control and social interaction. Philosophical Transactions of the Royal Society B: Biological Sciences, 2003, 358, 593-602.	1.8	956
8	Spatio-Temporal Prediction Modulates the Perception of Self-Produced Stimuli. Journal of Cognitive Neuroscience, 1999, 11, 551-559.	1.1	749
9	Bayesian decision theory in sensorimotor control. Trends in Cognitive Sciences, 2006, 10, 319-326.	4.0	724
10	MOSAIC Model for Sensorimotor Learning and Control. Neural Computation, 2001, 13, 2201-2220.	1.3	714
11	Maintaining internal representations: the role of the human superior parietal lobe. Nature Neuroscience, 1998, 1, 529-533.	7.1	670
12	Perspectives and problems in motor learning. Trends in Cognitive Sciences, 2001, 5, 487-494.	4.0	667
13	Spontaneous Cortical Activity Reveals Hallmarks of an Optimal Internal Model of the Environment. Science, 2011, 331, 83-87.	6.0	593
14	Statistically optimal perception and learning: from behavior to neural representations. Trends in Cognitive Sciences, 2010, 14, 119-130.	4.0	539
15	Changes of mind in decision-making. Nature, 2009, 461, 263-266.	13.7	528
16	Motor control is decision-making. Current Opinion in Neurobiology, 2012, 22, 996-1003.	2.0	333
17	Computational principles of sensorimotor control that minimize uncertainty and variability. Journal of Physiology, 2007, 578, 387-396.	1.3	284
18	Failure to Consolidate the Consolidation Theory of Learning for Sensorimotor Adaptation Tasks. Journal of Neuroscience, 2004, 24, 8662-8671.	1.7	232

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19	Modular decomposition in visuomotor learning. Nature, 1997, 386, 392-395.	13.7	204
20	A modular planar robotic manipulandum with end-point torque control. Journal of Neuroscience Methods, 2009, 181, 199-211.	1.3	199
21	Neural Variability and Sampling-Based Probabilistic Representations in the Visual Cortex. Neuron, 2016, 92, 530-543.	3.8	196
22	Bayesian learning of visual chunks by human observers. Proceedings of the National Academy of Sciences of the United States of America, 2008, 105, 2745-2750.	3.3	194
23	With or without you: predictive coding and Bayesian inference in the brain. Current Opinion in Neurobiology, 2017, 46, 219-227.	2.0	185
24	Decision-making in sensorimotor control. Nature Reviews Neuroscience, 2018, 19, 519-534.	4.9	183
25	A common mechanism underlies changes of mind about decisions and confidence. ELife, 2016, 5, e12192.	2.8	172
26	Effective reinforcement learning following cerebellar damage requires a balance between exploration and motor noise. Brain, 2016, 139, 101-114.	3.7	161
27	Probabilistic models in human sensorimotor control. Human Movement Science, 2007, 26, 511-524.	0.6	154
28	Dynamically detuned oscillations account for the coupled rate and temporal code of place cell firing. Hippocampus, 2003, 13, 700-714.	0.9	145
29	Functional Magnetic Resonance Imaging of Impaired Sensory Prediction in Schizophrenia. JAMA Psychiatry, 2014, 71, 28.	6.0	138
30	Internal Models in Biological Control. Annual Review of Control, Robotics, and Autonomous Systems, 2019, 2, 339-364.	7.5	137
31	Evidence for an Eye-Centered Spherical Representation of the Visuomotor Map. Journal of Neurophysiology, 1999, 81, 935-939.	0.9	132
32	On the Origins of Suboptimality in Human Probabilistic Inference. PLoS Computational Biology, 2014, 10, e1003661.	1.5	129
33	The Dynamical Regime of Sensory Cortex: Stable Dynamics around a Single Stimulus-Tuned Attractor Account for Patterns of Noise Variability. Neuron, 2018, 98, 846-860.e5.	3.8	121
34	Statistical treatment of looking-time data.. Developmental Psychology, 2016, 52, 521-536.	1.2	116
35	Motor Planning, Not Execution, Separates Motor Memories. Neuron, 2016, 92, 773-779.	3.8	113
36	Matching storage and recall: hippocampal spike timingâ€"dependent plasticity and phase response curves. Nature Neuroscience, 2005, 8, 1677-1683.	7.1	112

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37	Parallel specification of competing sensorimotor control policies for alternative action options. Nature Neuroscience, 2016, 19, 320-326.	7.1	102
38	Ageing increases reliance on sensorimotor prediction through structural and functional differences in frontostriatal circuits. Nature Communications, 2016, 7, 13034.	5.8	101
39	Theoretical perspectives on active sensing. Current Opinion in Behavioral Sciences, 2016, 11, 100-108.	2.0	95
40	Motor learning. Current Biology, 2010, 20, R467-R472.	1.8	94
41	Confidence Is the Bridge between Multi-stage Decisions. Current Biology, 2016, 26, 3157-3168.	1.8	93
42	Computations underlying sensorimotor learning. Current Opinion in Neurobiology, 2016, 37, 7-11.	2.0	86
43	Fast But Fleeting: Adaptive Motor Learning Processes Associated with Aging and Cognitive Decline. Journal of Neuroscience, 2014, 34, 13411-13421.	1.7	84
44	Global and Multiplexed Dendritic Computations under InÂVivo-like Conditions. Neuron, 2018, 100, 579-592.e5.	3.8	83
45	Contextual inference underlies the learning of sensorimotor repertoires. Nature, 2021, 600, 489-493.	13.7	82
46	Predictive Motor Learning of Temporal Delays. Journal of Neurophysiology, 1999, 82, 2039-2048.	0.9	79
47	Motor Effort Alters Changes of Mind in Sensorimotor Decision Making. PLoS ONE, 2014, 9, e92681.	1.1	78
48	Cortical-like dynamics in recurrent circuits optimized for sampling-based probabilistic inference. Nature Neuroscience, 2020, 23, 1138-1149.	7.1	76
49	Active sensing in the categorization of visual patterns. ELife, 2016, 5, .	2.8	75
50	The Value of the Follow-Through Derives from Motor Learning Depending on Future Actions. Current Biology, 2015, 25, 397-401.	1.8	73
51	Action plan co-optimization reveals the parallel encoding of competing reach movements. Nature Communications, 2015, 6, 7428.	5.8	67
52	Goal-Directed Decision Making with Spiking Neurons. Journal of Neuroscience, 2016, 36, 1529-1546.	1.7	62
53	Synapses with short-term plasticity are optimal estimators of presynaptic membrane potentials. Nature Neuroscience, 2010, 13, 1271-1275.	7.1	61
54	Flexible Representations of Dynamics Are Used in Object Manipulation. Current Biology, 2008, 18, 763-768.	1.8	56

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55	Representations of uncertainty in sensorimotor control. Current Opinion in Neurobiology, 2011, 21, 629-635.	2.0	55
56	The Role of Ongoing Dendritic Oscillations in Single-Neuron Dynamics. PLoS Computational Biology, 2009, 5, e1000493.	1.5	54
57	Democracy-Independence Trade-Off in Oscillating Dendrites and Its Implications for Grid Cells. Neuron, 2010, 66, 429-437.	3.8	53
58	The Hamiltonian Brain: Efficient Probabilistic Inference with Excitatory-Inhibitory Neural Circuit Dynamics. PLoS Computational Biology, 2016, 12, e1005186.	1.5	53
59	Learning and Decay of Prediction in Object Manipulation. Journal of Neurophysiology, 2000, 84, 334-343.	0.9	50
60	Piercing of Consciousness as a Threshold-Crossing Operation. Current Biology, 2017, 27, 2285-2295.e6.	1.8	49
61	Increasing Motor Noise Impairs Reinforcement Learning in Healthy Individuals. ENeuro, 2018, 5, ENEURO.0050-18.2018.	0.9	48
62	Multiple motor memories are learned to control different points on a tool. Nature Human Behaviour, 2018, 2, 300-311.	6.2	47
63	The effect of visuomotor displacements on arm movement paths. Experimental Brain Research, 1999, 127, 213-223.	0.7	45
64	Rapid Visuomotor Responses Reflect Value-Based Decisions. Journal of Neuroscience, 2019, 39, 3906-3920.	1.7	45
65	Cognitive Tomography Reveals Complex, Task-Independent Mental Representations. Current Biology, 2013, 23, 2169-2175.	1.8	44
66	Age-related reduction in motor adaptation: brain structural correlates and the role of explicit memory. Neurobiology of Aging, 2020, 90, 13-23.	1.5	42
67	When Optimal Feedback Control Is Not Enough: Feedforward Strategies Are Required for Optimal Control with Active Sensing. PLoS Computational Biology, 2016, 12, e1005190.	1.5	42
68	Counterfactual Reasoning Underlies the Learning of Priors in Decision Making. Neuron, 2018, 99, 1083-1097.e6.	3.8	41
69	Increasing muscle co-contraction speeds up internal model acquisition during dynamic motor learning. Scientific Reports, 2018, 8, 16355.	1.6	40
70	Dendritic nonlinearities are tuned for efficient spike-based computations in cortical circuits. ELife, 2015, 4, .	2.8	37
71	Planning in the brain. Neuron, 2022, 110, 914-934.	3.8	37
72	Rapid Automatic Motor Encoding of Competing Reach Options. Cell Reports, 2017, 18, 1619-1626.	2.9	36

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73	Computational theories on the function of theta oscillations. Biological Cybernetics, 2005, 92, 393-408.	0.6	34
74	Seeing what you want to see: priors for one's own actions represent exaggerated expectations of success. Frontiers in Behavioral Neuroscience, 2014, 8, 232.	1.0	34
75	The sequential encoding of competing action goals involves dynamic restructuring of motor plans in working memory. Journal of Neurophysiology, 2016, 115, 3113-3122.	0.9	34
76	TOPS (Task Optimization in the Presence of Signal-Dependent Noise) model. Systems and Computers in Japan, 2004, 35, 48-58.	0.2	33
77	Rapid visuomotor feedback gains are tuned to the task dynamics. Journal of Neurophysiology, 2017, 118, 2711-2726.	0.9	33
78	Imagery of movements immediately following performance allows learning of motor skills that interfere. Scientific Reports, 2018, 8, 14330.	1.6	30
79	Fractionation of the visuomotor feedback response to directions of movement and perturbation. Journal of Neurophysiology, 2014, 112, 2218-2233.	0.9	29
80	Rapid target foraging with reach or gaze: The hand looks further ahead than the eye. PLoS Computational Biology, 2017, 13, e1005504.	1.5	28
81	Rapid Visuomotor Corrective Responses during Transport of Hand-Held Objects Incorporate Novel Object Dynamics. Journal of Neuroscience, 2015, 35, 10572-10580.	1.7	27
82	Representations of uncertainty: where art thou?. Current Opinion in Behavioral Sciences, 2021, 38, 150-162.	2.0	27
83	Hippocampal rhythm generation: Gamma-related theta-frequency resonance in CA3 interneurons. Biological Cybernetics, 2001, 84, 123-132.	0.6	26
84	Inferring Visuomotor Priors for Sensorimotor Learning. PLoS Computational Biology, 2011, 7, e1001112.	1.5	26
85	Comment on â€œSingle-trial spike trains in parietal cortex reveal discrete steps during decision-makingâ€• Science, 2016, 351, 1406-1406.	6.0	26
86	Model-Free Robust Optimal Feedback Mechanisms of Biological Motor Control. Neural Computation, 2020, 32, 562-595.	1.3	26
87	Multiple decisions about one object involve parallel sensory acquisition but time-multiplexed evidence incorporation. ELife, 2021, 10, .	2.8	26
88	Theta oscillation-coupled dendritic spiking integrates inputs on a long time scale. Hippocampus, 2005, 15, 950-962.	0.9	24
89	Grip force when reaching with target uncertainty provides evidence for motor optimization over averaging. Scientific Reports, 2017, 7, 11703.	1.6	21
90	Q&A: Robotics as a tool to understand the brain. BMC Biology, 2010, 8, 92.	1.7	19

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91	Target Uncertainty Mediates Sensorimotor Error Correction. PLoS ONE, 2017, 12, e0170466.	1.1	18
92	Optimal Recall from Bounded Metaplastic Synapses: Predicting Functional Adaptations in Hippocampal Area CA3. PLoS Computational Biology, 2014, 10, e1003489.	1.5	17
93	Enhanced crosslimb transfer of force-field learning for dynamics that are identical in extrinsic and joint-based coordinates for both limbs. Journal of Neurophysiology, 2016, 115, 445-456.	0.9	15
94	Theta-Modulated Feedforward Network Generates Rate and Phase Coded Firing in the Entorhino-Hippocampal System. IEEE Transactions on Neural Networks, 2004, 15, 1092-1099.	4.8	14
95	The Sensorimotor System Can Sculpt Behaviorally Relevant Representations for Motor Learning. ENeuro, 2016, 3, ENEURO.0070-16.2016.	0.9	13
96	Phase Coding: Spikes Get a Boost from Local Fields. Current Biology, 2008, 18, R349-R351.	1.8	12
97	31.1:Invited Paper: Programmable Electrostatic Surface for Tactile Perceptions. Digest of Technical Papers SID International Symposium, 2012, 43, 407-410.	0.1	11
98	Coordinate Representations for Interference Reduction in Motor Learning. PLoS ONE, 2015, 10, e0129388.	1.1	11
99	An error-tuned model for sensorimotor learning. PLoS Computational Biology, 2017, 13, e1005883.	1.5	11
100	Unimodal statistical learning produces multimodal object-like representations. ELife, 2019, 8, .	2.8	11
101	Motor memories of object dynamics are categorically organized. ELife, 2021, 10, .	2.8	11
102	Intrahippocampal gamma and theta rhythm generation in a network model of inhibitory interneurons. Neurocomputing, 2001, 38-40, 713-719.	3.5	10
103	Human decision making anticipates future performance in motor learning. PLoS Computational Biology, 2020, 16, e1007632.	1.5	10
104	A Theoretical Framework for the Dynamics of Multiple Intrinsic Oscillators in Single Neurons. , 2012, , 53-72.		9
105	The Redemption of Noise: Inference with Neural Populations. Trends in Neurosciences, 2018, 41, 767-770.	4.2	5
106	Computations in Sensorimotor Learning. Cold Spring Harbor Symposia on Quantitative Biology, 2014, 79, 93-98.	2.0	4
107	Adaptive coupling influences generalization of sensorimotor learning. PLoS ONE, 2018, 13, e0207482.	1.1	4
108	Separate motor memories are formed when controlling different implicitly specified locations on a tool. Journal of Neurophysiology, 2019, 121, 1342-1351.	0.9	4

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109	Motor memories in manipulation tasks are linked to contact goals between objects. Journal of Neurophysiology, 2020, 124, 994-1004.	0.9	4
110	Probabilistic Mechanisms in Sensorimotor Control. Novartis Foundation Symposium, 0, , 191-202.	1.2	4
111	Representational untangling by the firing rate nonlinearity in V1 simple cells. ELife, 2019, 8, .	2.8	4
112	Single Cell and Population Activities in Cortical-like Systems. Reviews in the Neurosciences, 1999, 10, 201-12.	1.4	3
113	Effect of dendritic location and different components of LTP expression on the bursting activity of hippocampal CA1 pyramidal cells. Neurocomputing, 2004, 58-60, 691-697.	3.5	3
114	The visual geometry of a tool modulates generalization during adaptation. Scientific Reports, 2019, 9, 2731.	1.6	3
115	Adaptive erasure of spurious sequences in sensory cortical circuits. Neuron, 2022, , .	3.8	3
116	Dendritic spiking accounts for rate and phase coding in a biophysical model of a hippocampal place cell. Neurocomputing, 2005, 65-66, 331-341.	3.5	2
117	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
118	Location-dependent differences between somatic and dendritic IPSPs. Neurocomputing, 1999, 26-27, 193-197.	3.5	1
119	The role of ongoing dendritic oscillations in single-neuron dynamics. Nature Precedings, 2009, , .	0.1	0
120	Requirements for a single cell mechanism of entorhinal "grid field" activity: role of dendritic oscillators and coupling. Nature Precedings, 2009, , .	0.1	0
121	Editorial overview: Computational neuroscience. Current Opinion in Neurobiology, 2019, 58, iii-vii.	2.0	0
122	Episodic Memory and Cognitive Map in a Rate Model Network of the Rat Hippocampus. Lecture Notes in Computer Science, 2001, , 1135-1140.	1.0	0
123	Modeling information integration in sequential visual decision-making. Journal of Vision, 2015, 15, 90.	0.1	0
124	Reach adaption to a visuomotor gain with terminal error feedback involves reinforcement learning. PLoS ONE, 2022, 17, e0269297.	1.1	0