Riccardo Zecchina

List of Publications by Year in Descending Order

125 papers	7,568 citations	40 h-index	85 g-index
134 ext. papers	9,362 ext. citations	4.7 avg, IF	5.96 L-index

#	Paper	IF	Citations
125	Unveiling the Structure of Wide Flat Minima in Neural Networks.. *Physical Review Letters*, **2021**, 127, 278301	7.4	1
124	Native state of natural proteins optimizes local entropy.. *Physical Review E*, **2021**, 104, 064117	2.4	0
123	Entropic gradient descent algorithms and wide flat minima*. *Journal of Statistical Mechanics: Theory and Experiment*, **2021**, 2021, 124015	1.9	1
122	Shaping the learning landscape in neural networks around wide flat minima. *Proceedings of the National Academy of Sciences of the United States of America*, **2020**, 117, 161-170	11.5	18
121	Clustering of solutions in the symmetric binary perceptron. *Journal of Statistical Mechanics: Theory and Experiment*, **2020**, 2020, 073303	1.9	4
120	Wide flat minima and optimal generalization in classifying high-dimensional Gaussian mixtures. *Journal of Statistical Mechanics: Theory and Experiment*, **2020**, 2020, 124012	1.9	2
119	Properties of the Geometry of Solutions and Capacity of Multilayer Neural Networks with Rectified Linear Unit Activations. *Physical Review Letters*, **2019**, 123, 170602	7.4	18
118	Entropy-SGD: biasing gradient descent into wide valleys. *Journal of Statistical Mechanics: Theory and Experiment*, **2019**, 2019, 124018	1.9	30
117	From inverse problems to learning: a Statistical Mechanics approach. *Journal of Physics: Conference Series*, **2018**, 955, 012001	0.3	1
116	Efficiency of quantum vs. classical annealing in nonconvex learning problems. *Proceedings of the National Academy of Sciences of the United States of America*, **2018**, 115, 1457-1462	11.5	23
115	From statistical inference to a differential learning rule for stochastic neural networks. *Interface Focus*, **2018**, 8, 20180033	3.9	2
114	Role of Synaptic Stochasticity in Training Low-Precision Neural Networks. *Physical Review Letters*, **2018**, 120, 268103	7.4	10
113	RNAs competing for microRNAs mutually influence their fluctuations in a highly non-linear microRNA-dependent manner in single cells. *Genome Biology*, **2017**, 18, 37	18.3	28
112	Inverse statistical problems: from the inverse Ising problem to data science. *Advances in Physics*, **2017**, 66, 197-261	18.4	125
111	Unreasonable effectiveness of learning neural networks: From accessible states and robust ensembles to basic algorithmic schemes. *Proceedings of the National Academy of Sciences of the United States of America*, **2016**, 113, E7655-E7662	11.5	61
110	Learning may need only a few bits of synaptic precision. *Physical Review E*, **2016**, 93, 052313	2.4	11
109	Local entropy as a measure for sampling solutions in constraint satisfaction problems. *Journal of Statistical Mechanics: Theory and Experiment*, **2016**, 2016, 023301	1.9	28

108	Subdominant Dense Clusters Allow for Simple Learning and High Computational Performance in Neural Networks with Discrete Synapses. *Physical Review Letters*, **2015**, 115, 128101	7.4	44
107	A Three-Threshold Learning Rule Approaches the Maximal Capacity of Recurrent Neural Networks. *PLoS Computational Biology*, **2015**, 11, e1004439	5	13
106	Bridging the gaps in systems biology. *Molecular Genetics and Genomics*, **2014**, 289, 727-34	3.1	31
105	The patient-zero problem with noisy observations. *Journal of Statistical Mechanics: Theory and Experiment*, **2014**, 2014, P10016	1.9	20
104	Bayesian inference of epidemics on networks via belief propagation. *Physical Review Letters*, **2014**, 112, 118701	7.4	103
103	Containing Epidemic Outbreaks by Message-Passing Techniques. *Physical Review X*, **2014**, 4,	9.1	31
102	Fast and accurate multivariate Gaussian modeling of protein families: predicting residue contacts and protein-interaction partners. *PLoS ONE*, **2014**, 9, e92721	3.7	89
101	Sharing information to reconstruct patient-specific pathways in heterogeneous diseases. *Pacific Symposium on Biocomputing Pacific Symposium on Biocomputing*, **2014**, 39-50	1.3	4
100	Genome-wide analysis identifies a functional association of Tet1 and Polycomb repressive complex 2 in mouse embryonic stem cells. *Genome Biology*, **2013**, 14, R91	18.3	115
99	Integrated transcriptional and competitive endogenous RNA networks are cross-regulated in permissive molecular environments. *Proceedings of the National Academy of Sciences of the United States of America*, **2013**, 110, 7154-9	11.5	239
98	Perturbation biology: inferring signaling networks in cellular systems. *PLoS Computational Biology*, **2013**, 9, e1003290	5	98
97	Shape similarity, better than semantic membership, accounts for the structure of visual object representations in a population of monkey inferotemporal neurons. *PLoS Computational Biology*, **2013**, 9, e1003167	5	67
96	Simultaneous reconstruction of multiple signaling pathways via the prize-collecting steiner forest problem. *Journal of Computational Biology*, **2013**, 20, 124-36	1.7	78
95	Large deviations of cascade processes on graphs. *Physical Review E*, **2013**, 87, 062115	2.4	35
94	Optimizing spread dynamics on graphs by message passing. *Journal of Statistical Mechanics: Theory and Experiment*, **2013**, 2013, P09011	1.9	55
93	Modelling Competing Endogenous RNA Networks. *PLoS ONE*, **2013**, 8, e66609	3.7	88
92	Theory and learning protocols for the material tempotron model. *Journal of Statistical Mechanics: Theory and Experiment*, **2013**, 2013, P12013	1.9	4
91	Cavity approach to sphere packing in Hamming space. *Physical Review E*, **2012**, 85, 021106	2.4	1

90	Performance of a cavity-method-based algorithm for the prize-collecting Steiner tree problem on graphs. *Physical Review E*, **2012**, 86, 026706	2.4	11
89	Sign problem in the Bethe approximation. *Physical Review B*, **2012**, 86,	3.3	8
88	Simultaneous Reconstruction of Multiple Signaling Pathways via the Prize-Collecting Steiner Forest Problem. *Lecture Notes in Computer Science*, **2012**, 287-301	0.9	5
87	Statistical physics approach to graphical games: local and global interactions. *European Physical Journal B*, **2011**, 81, 327-339	1.2	8
86	An externally modulated, noise-driven switch for the regulation of SPI1 in Salmonella enterica serovar Typhimurium. *Journal of Mathematical Biology*, **2011**, 63, 637-62	2	12
85	Belief Propagation for Weighted b-Matchings on Arbitrary Graphs and its Relation to Linear Programs with Integer Solutions. *SIAM Journal on Discrete Mathematics*, **2011**, 25, 989-1011	0.7	35
84	Stochastic optimization by message passing. *Journal of Statistical Mechanics: Theory and Experiment* , **2011**, 2011, P11009	1.9	9
83	Inference and learning in sparse systems with multiple states. *Physical Review E*, **2011**, 83, 056114	2.4	16
82	Efficient data compression from statistical physics of codes over finite fields. *Physical Review E*, **2011**, 84, 051111	2.4	6
81	Stochastic matching problem. *Physical Review Letters*, **2011**, 106, 190601	7.4	21
80	Finding undetected protein associations in cell signaling by belief propagation. *Proceedings of the National Academy of Sciences of the United States of America*, **2011**, 108, 882-7	11.5	91
79	Direct-coupling analysis of residue coevolution captures native contacts across many protein families. *Proceedings of the National Academy of Sciences of the United States of America*, **2011**, 108, E1293-301	11.5	837
78	Protein 3D structure computed from evolutionary sequence variation. *PLoS ONE*, **2011**, 6, e28766	3.7	709
77	Aligning graphs and finding substructures by a cavity approach. *Europhysics Letters*, **2010**, 89, 37009	1.6	18
76	Inference of sparse combinatorial-control networks from gene-expression data: a message passing approach. *BMC Bioinformatics*, **2010**, 11, 355	3.6	32
75	Efficient LDPC codes over GF(q) for lossy data compression **2009**,		6
74	Statistical mechanics of budget-constrained auctions. *Journal of Statistical Mechanics: Theory and Experiment*, **2009**, 2009, P07002	1.9	7
73	Clustering with shallow trees. *Journal of Statistical Mechanics: Theory and Experiment*, **2009**, 2009, P12010	1.9	7

72	A Prize-Collecting Steiner Tree Approach for Transduction Network Inference. *Lecture Notes in Computer Science*, **2009**, 83-95	0.9	4
71	A rigorous analysis of the cavity equations for the minimum spanning tree. *Journal of Mathematical Physics*, **2008**, 49, 125206	1.2	14
70	Inference algorithms for gene networks: a statistical mechanics analysis. *Journal of Statistical Mechanics: Theory and Experiment*, **2008**, 2008, P12001	1.9	18
69	Statistical mechanics of steiner trees. *Physical Review Letters*, **2008**, 101, 037208	7.4	33
68	Entropy landscape and non-Gibbs solutions in constraint satisfaction problems. *Physical Review E*, **2008**, 77, 031118	2.4	38
67	On the exactness of the cavity method for weighted b-matchings on arbitrary graphs and its relation to linear programs. *Journal of Statistical Mechanics: Theory and Experiment*, **2008**, 2008, L06001	1.9	20
66	Gene-network inference by message passing. *Journal of Physics: Conference Series*, **2008**, 95, 012016	0.3	7
65	Pairs of SAT-assignments in random Boolean formul *Theoretical Computer Science*, **2008**, 393, 260-279	1.1	18
64	Encoding for the Blackwell Channel with Reinforced Belief Propagation **2007**,		11
63	Efficient supervised learning in networks with binary synapses. *Proceedings of the National Academy of Sciences of the United States of America*, **2007**, 104, 11079-84	11.5	55
62	Propagation of external regulation and asynchronous dynamics in random Boolean networks. *Chaos*, **2007**, 17, 026109	3.3	3
61	The computational core and fixed point organization in Boolean networks. *Journal of Statistical Mechanics: Theory and Experiment*, **2006**, 2006, P03002-P03002	1.9	11
60	Core percolation and onset of complexity in boolean networks. *Physical Review Letters*, **2006**, 96, 018101	7.4	22
59	Statistical mechanics of combinatorial auctions. *Physical Review Letters*, **2006**, 97, 128701	7.4	6
58	Learning by message passing in networks of discrete synapses. *Physical Review Letters*, **2006**, 96, 030201	7.4	96
57	FROM STATISTICAL PHYSICS METHODS TO ALGORITHMS. *International Journal of Modern Physics B*, **2006**, 20, 2814-2823	1.1	1
56	Message-Passing Algorithms for Non-Linear Nodes and Data Compression. *Complexus*, **2006**, 3, 58-65		11
55	Threshold values of random K-SAT from the cavity method. *Random Structures and Algorithms*, **2006**, 28, 340-373	0.8	110

54	Statistical Mechanics and Combinatorial Problems **2006**, 50-55		
53	Construction and VHDL Implementation of a Fully Local Network with Good Reconstruction Properties of the Inputs. *Lecture Notes in Computer Science*, **2005**, 385-394	0.9	1
52	Survey-propagation decimation through distributed local computations. *Journal of Statistical Mechanics: Theory and Experiment*, **2005**, 2005, P11016-P11016	1.9	26
51	Statistical physics, optimization and source coding **2005**, 64, 1161-1173		
50	Survey propagation: An algorithm for satisfiability. *Random Structures and Algorithms*, **2005**, 27, 201-226	0.8	235
49	Source coding by efficient selection of ground-state clusters. *Physical Review E*, **2005**, 72, 015103	2.4	7
48	Clustering of solutions in the random satisfiability problem. *Physical Review Letters*, **2005**, 94, 197205	7.4	89
47	Lossy data compression with random gates. *Physical Review Letters*, **2005**, 95, 038701	7.4	21
46	Survey propagation as local equilibrium equations. *Journal of Statistical Mechanics: Theory and Experiment*, **2004**, 2004, P06007	1.9	40
45	Minimizing energy below the glass thresholds. *Physical Review E*, **2004**, 70, 036107	2.4	17
44	Survey and Belief Propagation on Random K-SAT. *Lecture Notes in Computer Science*, **2004**, 519-528	0.9	6
43	Bicolouring random hypergraphs. *Journal of Physics A*, **2003**, 36, 11037-11053		10
42	Two Solutions to Diluted p-Spin Models and XORSAT Problems. *Journal of Statistical Physics*, **2003**, 111, 505-533	1.5	137
41	Polynomial iterative algorithms for coloring and analyzing random graphs. *Physical Review E*, **2003**, 68, 036702	2.4	60
40	Are financial markets efficient? Phase transition in the aggregation of information. *Complexity*, **2002**, 8, 20-23	1.6	49
39	Ferromagnetic ordering in graphs with arbitrary degree distribution. *European Physical Journal B*, **2002**, 28, 191-197	1.2	149
38	Random K-satisfiability problem: from an analytic solution to an efficient algorithm. *Physical Review E*, **2002**, 66, 056126	2.4	257
37	Coloring random graphs. *Physical Review Letters*, **2002**, 89, 268701	7.4	129

36	Optimizing searches via rare events. *Physical Review Letters*, **2002**, 88, 178701	7.4	75
35	Hiding solutions in random satisfiability problems: a statistical mechanics approach. *Physical Review Letters*, **2002**, 88, 188701	7.4	45
34	Complexity transitions in global algorithms for sparse linear systems over finite fields. *Journal of Physics A*, **2002**, 35, 7559-7574		9
33	Analytic and algorithmic solution of random satisfiability problems. *Science*, **2002**, 297, 812-5	33.3	660
32	Statistical mechanics methods and phase transitions in optimization problems. *Theoretical Computer Science*, **2001**, 265, 3-67	1.1	111
31	Counting over non-planar graphs. *Physica A: Statistical Mechanics and Its Applications*, **2001**, 302, 100-109	3.3	3
30	A ferromagnet with a glass transition. *Europhysics Letters*, **2001**, 55, 465-471	1.6	76
29	Phase coexistence and finite-size scaling in random combinatorial problems. *Journal of Physics A*, **2001**, 34, 4615-4626		15
28	Simplest random K-satisfiability problem. *Physical Review E*, **2001**, 63, 026702	2.4	73
27	Learning to coordinate in a complex and nonstationary world. *Physical Review Letters*, **2001**, 87, 208701	7.4	16
26	Exact solutions for diluted spin glasses and optimization problems. *Physical Review Letters*, **2001**, 87, 127209	7.4	54
25	Statistical mechanics of asset markets with private information. *Quantitative Finance*, **2001**, 1, 203-211	1.6	14
24	Exact solution of a modified El Farol's bar problem: Efficiency and the role of market impact. *Physica A: Statistical Mechanics and Its Applications*, **2000**, 280, 522-553	3.3	90
23	Statistical mechanics of systems with heterogeneous agents: minority games. *Physical Review Letters*, **2000**, 84, 1824-7	7.4	195
22	Glassy dynamics near zero temperature. *Physical Review E*, **2000**, 62, R7567-70	2.4	27
21	Comment on "Thermal model for adaptive competition in a market". *Physical Review Letters*, **2000**, 85, 5008	7.4	19
20	Combinatorial and topological approach to the 3D Ising model. *Journal of Physics A*, **2000**, 33, 741-761		26
19	. *International Journal of Modern Physics B*, **2000**, 14, 943	1.1	17

18	Time scale separation and heterogeneous off-equilibrium dynamics in spin models over random graphs. *Physical Review E*, **1999**, 59, R1299-R1302	2.4	25
17	ON THE GROUND STATE STRUCTURE OF P AND NP-COMPLETE RANDOM DECISION PROBLEMS. *Modern Physics Letters B*, **1999**, 13, 1-12	1.6	8
16	Determining computational complexity from characteristic phase transitions *Nature*, **1999**, 400, 133-137	50.4	482
15	2+p-SAT: Relation of typical-case complexity to the nature of the phase transition. *Random Structures and Algorithms*, **1999**, 15, 414-435	0.8	49
14	Geometry, topology, and physics of non-Abelian lattices. *Rivista Del Nuovo Cimento*, **1998**, 21, 1-56	3.5	5
13	Tricritical points in random combinatorics: the -SAT case. *Journal of Physics A*, **1998**, 31, 9209-9217		29
12	Statistical mechanics of the random K-satisfiability model. *Physical Review E*, **1997**, 56, 1357-1370	2.4	138
11	Two-boson Hamiltonian for Shor's algorithm. *Physical Review A*, **1997**, 55, 2594-2597	2.6	6
10	Word Problem and Decimation Procedure in the Ising Model on Infinite Hyperbolic Group Lattices. *International Journal of Modern Physics B*, **1997**, 11, 2803-2831	1.1	
9	Exact solution of the Ising model on group lattices of genus g>1. *Journal of Mathematical Physics*, **1996**, 37, 2796-2814	1.2	21
8	Superfluidity of the Bose-Hubbard model: su (1,1) linearization scheme. *Physica A: Statistical Mechanics and Its Applications*, **1996**, 230, 300-312	3.3	4
7	Analytical and numerical study of internal representations in multilayer neural networks with binary weights. *Physical Review E*, **1996**, 54, 717-736	2.4	14
6	Entropy of the K-satisfiability problem. *Physical Review Letters*, **1996**, 76, 3881-3885	7.4	106
5	Weight Space Structure and Internal Representations: A Direct Approach to Learning and Generalization in Multilayer Neural Networks. *Physical Review Letters*, **1996**, 76, 2205-2205	7.4	3
4	Weight space structure and internal representations: A direct approach to learning and generalization in multilayer neural networks. *Physical Review Letters*, **1995**, 75, 2432-2435	7.4	56
3	Response functions improving performance in analog attractor neural networks. *Physical Review E*, **1994**, 49, R1823-R1826	2.4	9
2	Symmetry breaking in nonmonotonic neural networks. *Journal of Physics A*, **1993**, 26, L507-L513		27
1	Generalized fullerene-like lattices, and itinerant interacting electrons. *Physica A: Statistical Mechanics and Its Applications*, **1993**, 199, 539-570	3.3	6