Christoph Adami

List of Publications by Year
in descending order

149 papers	9,120 citations	57758 44 h-index	46799 89 g-index
160 all docs	160 docs citations	160 times ranked	6707 citing authors

#	Article	IF	Citations
1	Why highly expressed proteins evolve slowly. Proceedings of the National Academy of Sciences of the United States of America, 2005, 102, 14338-14343.	7.1	738
2	The evolutionary origin of complex features. Nature, 2003, 423, 139-144.	27.8	643
3	Evolution of digital organisms at high mutation rates leads to survival of the flattest. Nature, 2001, 412, 331-333.	27.8	548
4	Evolution of biological complexity. Proceedings of the National Academy of Sciences of the United States of America, 2000, 97, 4463-4468.	7.1	435
5	Negative Entropy and Information in Quantum Mechanics. Physical Review Letters, 1997, 79, 5194-5197.	7.8	324
6	Thermodynamic prediction of protein neutrality. Proceedings of the National Academy of Sciences of the United States of America, 2005, 102, 606-611.	7.1	320
7	What is complexity?. BioEssays, 2002, 24, 1085-1094.	2.5	306
8	Introduction to Artificial Life. , 1998, , .		264
9	Optical simulation of quantum logic. Physical Review A, 1998, 57, R1477-R1480.	2.5	262
10	Genome complexity, robustness and genetic interactions in digital organisms. Nature, 1999, 400, 661-664.	27.8	255
11	Open Problems in Artificial Life. Artificial Life, 2000, 6, 363-376.	1.3	235
12	Quantum Entanglement of Moving Bodies. Physical Review Letters, 2002, 89, 270402.	7.8	234
13	Information theory in molecular biology. Physics of Life Reviews, 2004, 1, 3-22.	2.8	171
14	von Neumann capacity of noisy quantum channels. Physical Review A, 1997, 56, 3470-3483.	2.5	152
15	Evolutionary instability of zero-determinant strategies demonstrates that winning is not everything. Nature Communications, 2013, 4, 2193.	12.8	150
16	Evolution of Complex Modular Biological Networks. PLoS Computational Biology, 2008, 4, e23.	3.2	145
17	Evolutionary game theory using agent-based methods. Physics of Life Reviews, 2016, 19, 1-26.	2.8	143
18	Apparent dependence of protein evolutionary rate on number of interactions is linked to biases in protein-protein interactions data sets. BMC Evolutionary Biology, 2003, 3, 21.	3.2	123

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19	Reduction criterion for separability. Physical Review A, 1999, 60, 898-909.	2.5	118
20	Evolution of mutational robustness. Mutation Research - Fundamental and Molecular Mechanisms of Mutagenesis, 2003, 522, 3-11.	1.0	116
21	Predator confusion is sufficient to evolve swarming behaviour. Journal of the Royal Society Interface, 2013, 10, 20130305.	3.4	111
22	Adaptive Radiation from Resource Competition in Digital Organisms. Science, 2004, 305, 84-86.	12.6	110
23	Physical complexity of symbolic sequences. Physica D: Nonlinear Phenomena, 2000, 137, 62-69.	2.8	107
24	Digital genetics: unravelling the genetic basis of evolution. Nature Reviews Genetics, 2006, 7, 109-118.	16.3	103
25	Interaction between directional epistasis and average mutational effects. Proceedings of the Royal Society B: Biological Sciences, 2001, 268, 1469-1474.	2.6	100
26	Information theory of quantum entanglement and measurement. Physica D: Nonlinear Phenomena, 1998, 120, 62-81.	2.8	99
27	Sequence dependence of isothermal DNA amplification via EXPAR. Nucleic Acids Research, 2012, 40, e87-e87.	14.5	96
28	Stability and the Evolvability of Function in a Model Protein. Biophysical Journal, 2004, 86, 2758-2764.	0.5	95
29	Matter under extreme conditions. Physics Reports, 1993, 234, 1-71.	25.6	88
30	The Surprising Creativity of Digital Evolution: A Collection of Anecdotes from the Evolutionary Computation and Artificial Life Research Communities. Artificial Life, 2020, 26, 274-306.	1.3	88
31	The biology of digital organisms. Trends in Ecology and Evolution, 2002, 17, 528-532.	8.7	86
32	Impact of epistasis and pleiotropy on evolutionary adaptation. Proceedings of the Royal Society B: Biological Sciences, 2012, 279, 247-256.	2.6	85
33	Integrated Information Increases with Fitness in the Evolution of Animats. PLoS Computational Biology, 2011, 7, e1002236.	3.2	84
34	Self-organized criticality in living systems. Physics Letters, Section A: General, Atomic and Solid State Physics, 1995, 203, 29-32.	2.1	73
35	The use of information theory in evolutionary biology. Annals of the New York Academy of Sciences, 2012, 1256, 49-65.	3.8	72
36	Evolution of Integrated Causal Structures in Animats Exposed to Environments of Increasing Complexity. PLoS Computational Biology, 2014, 10, e1003966.	3.2	71

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37	A Developmental Model for the Evolution of Artificial Neural Networks. Artificial Life, 2000, 6, 189-218.	1.3	68
38	Quantum extension of conditional probability. Physical Review A, 1999, 60, 893-897.	2.5	65
39	Entangled light in moving frames. Physical Review A, 2003, 68, .	2.5	64
40	Compensatory mutations cause excess of antagonistic epistasis in RNA secondary structure folding. BMC Evolutionary Biology, 2003, 3, 3.	3.2	61
41	The Evolution of Representation in Simple Cognitive Networks. Neural Computation, 2013, 25, 2079-2107.	2.2	57
42	QCD sum rules at low temperature. Physical Review D, 1991, 43, 921-932.	4.7	56
43	Selective pressures on genomes in molecular evolution. Journal of Theoretical Biology, 2003, 222, 477-483.	1.7	51
44	Evolutionary rate depends on number of protein-protein interactions independently of gene expression level: response. BMC Evolutionary Biology, 2004, 4, 14.	3.2	48
45	COMPUTER SCIENCE: What Do Robots Dream Of?. Science, 2006, 314, 1093-1094.	12.6	48
46	Evolving Virtual Creatures and Catapults. Artificial Life, 2007, 13, 139-157.	1.3	46
47	Viral evolution under the pressure of an adaptive immune system: Optimal mutation rates for viral escape. Complexity, 2002, 8, 28-33.	1.6	44
48	Risk sensitivity as an evolutionary adaptation. Scientific Reports, 2015, 5, 8242.	3.3	43
49	Isospin breaking in nuclear physics: The Nolen-Schiffer effect. Zeitschrift FÃ¼r Physik A, 1991, 340, 93-100.	0.9	42
50	What is information? <sup />. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2016, 374, 20150230.	3.4	41
51	Exploring the evolution of a trade-off between vigilance and foraging in group-living organisms. Royal Society Open Science, 2015, 2, 150135.	2.4	40
52	Monomer Abundance Distribution Patterns as a Universal Biosignature: Examples from Terrestrial and Digital Life. Journal of Molecular Evolution, 2011, 72, 283-295.	1.8	38
53	Negative Entropy in Quantum Information Theory. , 1997, , 77-84.		36
54	Towards photostatistics from photon-number discriminating detectors. Journal of Modern Optics, 2004, 51, 1517-1528.	1.3	36

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55	Selection for mutational robustness in finite populations. Journal of Theoretical Biology, 2006, 243, 181-190.	1.7	35
56	Robots with instincts. Nature, 2015, 521, 426-427.	27.8	35
57	Evolution of drift robustness in small populations. Nature Communications, 2017, 8, 1012.	12.8	33
58	Evolution of Robustness in Digital Organisms. Artificial Life, 2004, 10, 167-179.	1.3	32
59	Sequence complexity in Darwinian evolution. Complexity, 2002, 8, 49-56.	1.6	30
60	A simple explanation for taxon abundance patterns. Proceedings of the National Academy of Sciences of the United States of America, 1999, 96, 15017-15019.	7.1	29
61	Evolution of Swarming Behavior Is Shaped by How Predators Attack. Artificial Life, 2016, 22, 299-318.	1.3	29
62	Strong Selection Significantly Increases Epistatic Interactions in the Long-Term Evolution of a Protein. PLoS Genetics, 2016, 12, e1005960.	3.5	29
63	Learning and complexity in genetic auto-adaptive systems. Physica D: Nonlinear Phenomena, 1995, 80, 154-170.	2.8	28
64	Optimal adaptive performance and delocalization in NK fitness landscapes. Physica A: Statistical Mechanics and Its Applications, 2002, 304, 495-506.	2.6	28
65	Colored Motifs Reveal Computational Building Blocks in the C. elegans Brain. PLoS ONE, 2011, 6, e17013.	2.5	28
66	Design of evolvable computer languages. IEEE Transactions on Evolutionary Computation, 2002, 6, 420-424.	10.0	27
67	Finite-temperature QCD sum rules for the nucleon. Physical Review D, 1992, 45, 4312-4322.	4.7	26
68	Influence of Chance, History, and Adaptation on Digital Evolution. Artificial Life, 2004, 10, 181-190.	1.3	26
69	Evolutionary computation technologies for space systems. , 2005, , .		25
70	Information Content of Colored Motifs in Complex Networks. Artificial Life, 2011, 17, 375-390.	1.3	25
71	Critical and near-critical branching processes. Physical Review E, 2002, 66, 011907.	2.1	24
72	Critical Dynamics in the Evolution of Stochastic Strategies for the Iterated Prisoner's Dilemma. PLoS Computational Biology, 2010, 6, e1000948.	3.2	23

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73	Evolution and stability of altruist strategies in microbial games. Physical Review E, 2012, 85, 011914.	2.1	21
74	Punishment in public goods games leads to meta-stable phase transitions and hysteresis. Physical Biology, 2015, 12, 046005.	1.8	21
75	Different Evolutionary Paths to Complexity for Small and Large Populations of Digital Organisms. PLoS Computational Biology, 2016, 12, e1005066.	3.2	21
76	The width of the Î”-isobar in chiral soliton models. Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics, 1988, 213, 373-375.	4.1	20
77	EVOLUTION: Reducible Complexity. Science, 2006, 312, 61-63.	12.6	20
78	Information-Theoretic Considerations Concerning the Origin of Life. Origins of Life and Evolution of Biospheres, 2015, 45, 309-317.	1.9	20
79	The capacity of black holes to transmit quantum information. Journal of High Energy Physics, 2014, 2014, 1.	4.7	19
80	Isospin violation in QCD sum rules for baryons. Physical Review D, 1993, 48, 2304-2312.	4.7	18
81	Evolution of Genome Size in Asexual Digital Organisms. Scientific Reports, 2016, 6, 25786.	3.3	17
82	Order of the QCD transition and QCD sum rules. Physical Review D, 1992, 46, 478-481.	4.7	16
83	Modularity and anti-modularity in networks with arbitrary degree distribution. Biology Direct, 2010, 5, 32.	4.6	16
84	Thermodynamics of evolutionary games. Physical Review E, 2018, 97, 062136.	2.1	16
85	Classical information transmission capacity of quantum black holes. Classical and Quantum Gravity, 2014, 31, 075015.	4.0	15
86	Information-Theoretic Neuro-Correlates Boost Evolution of Cognitive Systems. Entropy, 2016, 18, 6.	2.2	15
87	Critical interplay between density-dependent predation and evolution of the selfish herd. , 2013, , .		14
88	The Evolutionary Origin of Associative Learning. American Naturalist, 2020, 195, E1-E19.	2.1	14
89	A genome wide dosage suppressor network reveals genomic robustness. Nucleic Acids Research, 2017, 45, 255-270.	14.5	13
90	Predicting Evolution and Visualizing High-Dimensional Fitness Landscapes. Emergence, Complexity and Computation, 2014, , 509-526.	0.3	13

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91	Complex Langevin equation and the many-fermion problem. Physical Review C, 2001, 63, .	2.9	12
92	Black holes as bosonic Gaussian channels. Physical Review D, 2015, 92, .	4.7	12
93	Differentially-Expressed Pseudogenes in HIV-1 Infection. Viruses, 2015, 7, 5191-5205.	3.3	12
94	Random matrix model of adiabatic quantum computing. Physical Review A, 2005, 71, .	2.5	10
95	On Modeling Life. Artificial Life, 1994, 1, 429-438.	1.3	9
96	Trade-offs drive resource specialization and the gradual establishment of ecotypes. BMC Evolutionary Biology, 2014, 14, 113.	3.2	9
97	One-Shot Decoupling and Page Curves from a Dynamical Model for Black Hole Evaporation. Physical Review Letters, 2016, 116, 101301.	7.8	8
98	The structure of evolved representations across different substrates for artificial intelligence. , 2018, , .		8
99	Can Transfer Entropy Infer Information Flow in Neuronal Circuits for Cognitive Processing?. Entropy, 2020, 22, 385.	2.2	8
100	Soliton quantization in chiral models with vector mesons. Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics, 1988, 215, 387-391.	4.1	7
101	Experiments in Digital Evolution (Editors' Introduction to the Special Issue). Artificial Life, 2004, 10, 117-122.	1.3	7
102	The reasonable effectiveness of agent-based simulations in evolutionary game theory. Physics of Life Reviews, 2016, 19, 38-42.	2.8	7
103	Quantum information theory of the Bell-state quantum eraser. Physical Review A, 2017, 95, .	2.5	6
104	Moderate Amounts of Epistasis are Not Evolutionarily Stable in Small Populations. Journal of Molecular Evolution, 2020, 88, 435-444.	1.8	6
105	Modelling Stochastic Clonal Interference. Natural Computing Series, 2004, , 21-38.	2.2	6
106	Bifurcation into Functional Niches in Adaptation. Artificial Life, 2004, 10, 135-144.	1.3	5
107	Black holes are almost optimal quantum cloners. Journal of Physics A: Mathematical and Theoretical, 2015, 48, 23FT01.	2.1	5
108	Evolvability Tradeoffs in Emergent Digital Replicators. Artificial Life, 2016, 22, 483-498.	1.3	5

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109	From Entropy to Information: Biased Typewriters and the Origin of Life. , 0, , 130-154.		5
110	Evolution of Genetic Organization in Digital Organisms. Natural Computing Series, 2002, , 296-313.	2.2	5
111	Evolved digital ecosystems: Dynamic steady state, not optimal fixed point. , 0, , .		5
112	Evolution of an artificial visual cortex for image recognition. , 0, , .		5
113	The evolution of logic circuits for the purpose of protein contact map prediction. PeerJ, 2017, 5, e3139.	2.0	5
114	A Brief History of Artificial Intelligence Research. Artificial Life, 2021, 27, 131-137.	1.3	5
115	Cryptic Information Transfer in Differently-Trained Recurrent Neural Networks. , 2020, , .		5
116	Robust Monomer-Distribution Biosignatures in Evolving Digital Biota. Astrobiology, 2011, 11, 959-968.	3.0	4
117	Mapping the Peaks: Fitness Landscapes of the Fittest and the Flattest. Artificial Life, 2019, 25, 250-262.	1.3	4
118	Evolution of Differentiated Expression Patterns in Digital Organisms. Lecture Notes in Computer Science, 1999, , 129-138.	1.3	4
119	Towards photostatistics from photon-number discriminating detectors. Journal of Modern Optics, 2004, 51, 1517-1528.	1.3	4
120	Does self-replication imply evolvability?. , 0, , .		4
121	Entangled light in moving frames. , 2003, , .		4
122	Charmonium disintegration by field ionization. Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics, 1989, 217, 5-8.	4.1	3
123	Discovery and information-theoretic characterization of transcription factor binding sites that act cooperatively. Physical Biology, 2015, 12, 056004.	1.8	3
124	Evolution of sustained foraging in three-dimensional environments with physics. Genetic Programming and Evolvable Machines, 2016, 17, 359-390.	2.2	3
125	Origin of life in a digital microcosm. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2017, 375, 20160350.	3.4	3
126	Markovian and Non-Markovian Quantum Measurements. Foundations of Physics, 2020, 50, 1008-1055.	1.3	3

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127	Abundance-distributions in artificial life and stochastic models: â€œage and areaâ€•revisited. Lecture Notes in Computer Science, 1995, , 503-514.	1.3	3
128	Toward a Fully Relativistic Theory of Quantum Information. , 2011, , 71-102.		3
129	Flies as Ship Captains? Digital Evolution Unravels Selective Pressures to Avoid Collision in Drosophila. , 2016, , .		3
130	Evolution of Active Categorical Image Classification via Saccadic Eye Movement. Lecture Notes in Computer Science, 2016, , 581-590.	1.3	3
131	Information Fragmentation, Encryption and Information Flow in Complex Biological Networks. Entropy, 2022, 24, 735.	2.2	3
132	Adaptive walks on the fitness landscape of music. Proceedings of the National Academy of Sciences of the United States of America, 2012, 109, 11898-11899.	7.1	2
133	Information-theoretic characterization of the complete genotype-phenotype map of a complex pre-biotic world. Physics of Life Reviews, 2021, 38, 111-114.	2.8	2
134	Three Weeks with Hans Bethe. , 2006, , 45-110.		2
135	Exploring the coevolution of predator and prey morphology and behavior. , 2016, , .		2
136	Charmonium disintegration by field-ionization. Nuclear Physics A, 1989, 498, 501-506.	1.5	1
137	Evolution leads to a diversity of motion-detection neuronal circuits. , 2018, , .		1
138	Measuring Representation. , 2010, , .		1
139	Exploring Conditions That Select for the Evolution of Cooperative Group Foraging. , 0, , .		1
140	Evolving an optimal group size in groups of prey under predation. , 0, , .		1
141	Making Artificial Brains: Components, Topology, and Optimization. Artificial Life, 2022, , 1-10.	1.3	1
142	Emergence of functional information from multivariate correlations. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2022, 380, .	3.4	1
143	Information Theory, Evolution, and the Origin of Life. By HubertÂPÂ Yockey. Cambridge and New York: Cambridge University Press. $60.00. xi + 259 p; ill.; index. ISBN: 0â€“521â€“80293â€“8. 2005.. Quarterly Review of Biology, 2006, 81, 62-62.	0.1	0
144	PHILOSOPHY OF MIND: Who Watches the Watcher?. Science, 2007, 316, 1125-1126.	12.6	0

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145	The Engine of Complexity: Evolution as Computation. By John E. Mayfield. New York: Columbia University Press. $34.50. xv + 398 p.; ill.; index. ISBN: 978-0-231-16304-0. 2013.. Quarterly Review of Biology, 2015, 90, 90-91.	0.1	0
146	Escape from the Prisonerâ€™s Dilemma. Inference, 2021, 6, .	0.0	0
147	Artificial Evolution. , 2013, , 39-42.		0
148	More Bang For Your Buck: Quorum-Sensing Capabilities Improve the Efficacy of Suicidal Altruism. , 0, , .		0
149	Shared Information between Residues Is Sufficient to Detect Pairwise Epistasis in a Protein. PLoS Genetics, 2016, 12, e1006471.	3.5	0