

# Nikolaus Hansen

## List of Publications by Year in descending order

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118  
papers

11,297  
citations

279798

23  
h-index

243625

44  
g-index

122  
all docs

122  
docs citations

122  
times ranked

7309  
citing authors

#	ARTICLE	IF	CITATIONS
1	An ODE method to prove the geometric convergence of adaptive stochastic algorithms. <i>Stochastic Processes and Their Applications</i> , 2022, 145, 269-307.	0.9	3
2	Learning rate adaptation by line search in evolution strategies with recombination. , 2022, , .		1
3	COCO: a platform for comparing continuous optimizers in a black-box setting. <i>Optimization Methods and Software</i> , 2021, 36, 114-144.	2.4	161
4	A SIGEVO impact award for a paper arising from the COCO platform. <i>ACM SIGEVOlution</i> , 2021, 13, 1-11.	0.5	0
5	Augmented lagrangian, penalty techniques and surrogate modeling for constrained optimization with CMA-ES. , 2021, , .		3
6	Hypervolume in biobjective optimization cannot converge faster than $\hat{O}(1/p^i)$ . , 2021, , .		0
7	DMS and MultiGLODS. , 2021, , .		1
8	Scaling-invariant Functions versus Positively Homogeneous Functions. <i>Journal of Optimization Theory and Applications</i> , 2021, 191, 363-383.	1.5	2
9	On invariance and linear convergence of evolution strategies with augmented Lagrangian constraint handling. <i>Theoretical Computer Science</i> , 2020, 832, 68-97.	0.9	2
10	Quality gain analysis of the weighted recombination evolution strategy on general convex quadratic functions. <i>Theoretical Computer Science</i> , 2020, 832, 42-67.	0.9	14
11	Benchmarking large-scale continuous optimizers: The bbob-largescale testbed, a COCO software guide and beyond. <i>Applied Soft Computing Journal</i> , 2020, 97, 106737.	7.2	14
12	Phased-Array Antenna Pattern Optimization with Evolution Strategies. , 2020, , .		2
13	Sparse Inverse Covariance Learning for CMA-ES with Graphical Lasso. <i>Lecture Notes in Computer Science</i> , 2020, , 707-718.	1.3	0
14	CMA-ES and advanced adaptation mechanisms. , 2019, , .		0
15	A global surrogate assisted CMA-ES. , 2019, , .		36
16	Uncrowded hypervolume improvement. , 2019, , .		12
17	Mixed-integer benchmark problems for single- and bi-objective optimization. , 2019, , .		25
18	The impact of sample volume in random search on the bbob test suite. , 2019, , .		3

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19	On Bi-objective Convex-Quadratic Problems. Lecture Notes in Computer Science, 2019, , 3-14.	1.3	7
20	A Comparative Study of Large-Scale Variants of CMA-ES. Lecture Notes in Computer Science, 2018, , 3-15.	1.3	33
21	A practical guide to experimentation. , 2018, , .		0
22	CMA-ES and advanced adaptation mechanisms. , 2018, , .		0
23	Quality Gain Analysis of the Weighted Recombination Evolution Strategy on General Convex Quadratic Functions. , 2017, , .		7
24	Benchmarking CMAES-APOP on the BBOB noiseless testbed. , 2017, , .		8
25	Introduction to randomized continuous optimization. , 2017, , .		0
26	Linearly Convergent Evolution Strategies via Augmented Lagrangian Constraint Handling. , 2017, , .		15
27	A practical guide to benchmarking and experimentation. , 2017, , .		1
28	CMA-ES and advanced adaptation mechanisms. , 2017, , .		0
29	Quantitative Performance Assessment of Multiobjective Optimizers: The Average Runtime Attainment Function. Lecture Notes in Computer Science, 2017, , 103-119.	1.3	9
30	Benchmarking the Pure Random Search on the Bi-objective BBOB-2016 Testbed. , 2016, , .		2
31	GECCO'16 Black-Box Optimization Benchmarking Workshop (BBOB-2016). , 2016, , .		0
32	Permuted Orthogonal Block-Diagonal Transformation Matrices for Large Scale Optimization Benchmarking. , 2016, , .		2
33	Introduction to Randomized Continuous Optimization. , 2016, , .		1
34	Projection-Based Restricted Covariance Matrix Adaptation for High Dimension. , 2016, , .		19
35	Analysis of Linear Convergence of a $(1 + 1)$ -ES with Augmented Lagrangian Constraint Handling. , 2016, , .		1
36	Augmented Lagrangian Constraint Handling for CMA-ES – Case of a Single Linear Constraint. Lecture Notes in Computer Science, 2016, , 181-191.	1.3	14

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37	Unbounded Population MO-CMA-ES for the Bi-Objective BBOB Test Suite. , 2016, , .		15
38	The Impact of Variation Operators on the Performance of SMS-EMOA on the Bi-objective BBOB-2016 Test Suite. , 2016, , .		6
39	The Impact of Search Volume on the Performance of RANDOMSEARCH on the Bi-objective BBOB-2016 Test Suite. , 2016, , .		3
40	CMA-ES and Advanced Adaptation Mechanisms. , 2016, , .		5
41	Benchmarking RM-MEDA on the Bi-objective BBOB-2016 Test Suite. , 2016, , .		2
42	Linear Convergence of Comparison-based Step-size Adaptive Randomized Search via Stability of Markov Chains. SIAM Journal on Optimization, 2016, 26, 1589-1624.	2.0	28
43	Benchmarking MATLAB's gamultiobj (NSGA-II) on the Bi-objective BBOB-2016 Test Suite. , 2016, , .		4
44	Online Model Selection for Restricted Covariance Matrix Adaptation. Lecture Notes in Computer Science, 2016, , 3-13.	1.3	7
45	Markov Chain Analysis of Cumulative Step-Size Adaptation on a Linear Constrained Problem. Evolutionary Computation, 2015, 23, 611-640.	3.0	2
46	Benchmarking Numerical Multiobjective Optimizers Revisited. , 2015, , .		32
47	Evolution Strategies. , 2015, , 871-898.		92
48	Continuous Optimization and CMA-ES. , 2015, , .		5
49	Markov chain analysis of evolution strategies on a linear constraint optimization problem. , 2014, , .		4
50	Evolution strategies and CMA-ES (covariance matrix adaptation). , 2014, , .		6
51	Comparison-based natural gradient optimization in high dimension. , 2014, , .		29
52	How to Assess Step-Size Adaptation Mechanisms in Randomised Search. Lecture Notes in Computer Science, 2014, , 60-69.	1.3	10
53	Maximum Likelihood-Based Online Adaptation of Hyper-Parameters in CMA-ES. Lecture Notes in Computer Science, 2014, , 70-79.	1.3	8
54	Principled Design of Continuous Stochastic Search: From Theory to Practice. Natural Computing Series, 2014, , 145-180.	2.2	44

#	ARTICLE	IF	CITATIONS
55	A median success rule for non-elitist evolution strategies. , 2013, , .		13
56	Benchmarking the local metamodel CMA-ES on the noiseless BBOB'2013 test bed. , 2013, , .		18
57	Tutorial CMA-ES. , 2013, , .		4
58	A (1+1)-CMA-ES for constrained optimisation. , 2012, , .		64
59	On the impact of a small initial population size in the IPOP active CMA-ES with mirrored mutations on the noiseless BBOB testbed. , 2012, , .		1
60	On the effect of mirroring in the IPOP active CMA-ES on the noiseless BBOB testbed. , 2012, , .		4
61	On the impact of active covariance matrix adaptation in the CMA-ES with mirrored mutations and small initial population size on the noiseless BBOB testbed. , 2012, , .		2
62	Benchmarking of Continuous Black Box Optimization Algorithms. Evolutionary Computation, 2012, 20, 481-481.	3.0	9
63	Comparing mirrored mutations and active covariance matrix adaptation in the IPOP-CMA-ES on the noiseless BBOB testbed. , 2012, , .		1
64	Tutorial CMA-ES. , 2012, , .		41
65	Scalable structural break detection. Applied Soft Computing Journal, 2012, 12, 3408-3420.	7.2	3
66	Convergence of the Continuous Time Trajectories of Isotropic Evolution Strategies on Monotonic $C^2$ -composite Functions. Lecture Notes in Computer Science, 2012, , 42-51.	1.3	12
67	Cumulative Step-Size Adaptation on Linear Functions. Lecture Notes in Computer Science, 2012, , 72-81.	1.3	7
68	Impacts of invariance in search: When CMA-ES and PSO face ill-conditioned and non-separable problems. Applied Soft Computing Journal, 2011, 11, 5755-5769.	7.2	102
69	Log-Linear Convergence and Divergence of the Scale-Invariant (1+1)-ES in Noisy Environments. Algorithmica, 2011, 59, 425-460.	1.3	25
70	Analyzing the impact of mirrored sampling and sequential selection in elitist evolution strategies. , 2011, , .		9
71	Mirrored sampling in evolution strategies with weighted recombination. , 2011, , .		28
72	CMA-ES. , 2011, , .		25

#	ARTICLE	IF	CITATIONS
73	Theory of Evolution Strategies: A New Perspective. Theoretical Computer Science, 2011, , 289-325.	1.2	21
74	Comparing the (1+1)-CMA-ES with a mirrored (1+2)-CMA-ES with sequential selection on the noiseless BBOB-2010 testbed. , 2010, , .		2
75	Mirrored variants of the (1,2)-CMA-ES compared on the noisy BBOB-2010 testbed. , 2010, , .		3
76	Benchmarking the (1,4)-CMA-ES with mirrored sampling and sequential selection on the noisy BBOB-2010 testbed. , 2010, , .		4
77	Black-box optimization benchmarking of NEWUOA compared to BIPOP-CMA-ES. , 2010, , .		3
78	Mirrored variants of the (1,2)-CMA-ES compared on the noiseless BBOB-2010 testbed. , 2010, , .		5
79	Mirrored variants of the (1,4)-CMA-ES compared on the noisy BBOB-2010 testbed. , 2010, , .		2
80	Investigating the impact of sequential selection in the (1,2)-CMA-ES on the noisy BBOB-2010 testbed. , 2010, , .		2
81	Benchmarking a weighted negative covariance matrix update on the BBOB-2010 noiseless testbed. , 2010, , .		26
82	Benchmarking a weighted negative covariance matrix update on the BBOB-2010 noisy testbed. , 2010, , .		4
83	Active covariance matrix adaptation for the (1+1)-CMA-ES. , 2010, , .		31
84	Improved step size adaptation for the MO-CMA-ES. , 2010, , .		40
85	Investigating the impact of sequential selection in the (1,4)-CMA-ES on the noiseless BBOB-2010 testbed. , 2010, , .		6
86	Mirrored variants of the (1,4)-CMA-ES compared on the noiseless BBOB-2010 testbed. , 2010, , .		4
87	Benchmarking the (1,4)-CMA-ES with mirrored sampling and sequential selection on the noiseless BBOB-2010 testbed. , 2010, , .		5
88	Investigating the impact of sequential selection in the (1,4)-CMA-ES on the noisy BBOB-2010 testbed. , 2010, , .		3
89	Investigating the impact of sequential selection in the (1,2)-CMA-ES on the noiseless BBOB-2010 testbed. , 2010, , .		4
90	Covariance Matrix Adaptation Evolution Strategy for Multidisciplinary Optimization of Expendable Launcher Family. , 2010, , .		3

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91	Comparing results of 31 algorithms from the black-box optimization benchmarking BBOB-2009. , 2010, , .		233
92	Mirrored Sampling and Sequential Selection for Evolution Strategies. , 2010, , 11-21.		42
93	Benchmarking the (1+1)-CMA-ES on the BBOB-2009 function testbed. , 2009, , .		13
94	Benchmarking a BI-population CMA-ES on the BBOB-2009 function testbed. , 2009, , .		194
95	Benchmarking a BI-population CMA-ES on the BBOB-2009 noisy testbed. , 2009, , .		22
96	A Method for Handling Uncertainty in Evolutionary Optimization With an Application to Feedback Control of Combustion. IEEE Transactions on Evolutionary Computation, 2009, 13, 180-197.	10.0	244
97	Efficient covariance matrix update for variable metric evolution strategies. Machine Learning, 2009, 75, 167-197.	5.4	96
98	Recombination for Learning Strategy Parameters in the MO-CMA-ES. Lecture Notes in Computer Science, 2009, , 155-168.	1.3	11
99	Evolutionary Optimization of Feedback Controllers for Thermoacoustic Instabilities. IUTAM Symposium on Cellular, Molecular and Tissue Mechanics, 2008, , 311-317.	0.2	4
100	A Simple Modification in CMA-ES Achieving Linear Time and Space Complexity. Lecture Notes in Computer Science, 2008, , 296-305.	1.3	140
101	Steady-State Selection and Efficient Covariance Matrix Update in the Multi-objective CMA-ES. , 2007, , 171-185.		25
102	Covariance Matrix Adaptation for Multi-objective Optimization. Evolutionary Computation, 2007, 15, 1-28.	3.0	748
103	The CMA Evolution Strategy: A Comparing Review. Studies in Fuzziness and Soft Computing, 2006, , 75-102.	0.8	1,021
104	USPEXâ€™Evolutionary crystal structure prediction. Computer Physics Communications, 2006, 175, 713-720.	7.5	946
105	Reconsidering the progress rate theory for evolution strategies in finite dimensions. , 2006, , .		30
106	An Analysis of Mutative ĩf-Self-Adaptation on Linear Fitness Functions. Evolutionary Computation, 2006, 14, 255-275.	3.0	33
107	A computational efficient covariance matrix update and a (1+1)-CMA for evolution strategies. , 2006, , .		111
108	The CMA Evolution Strategy: A Comparing Review. , 2006, , 75-102.		79

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109	When Do Heavy-Tail Distributions Help?. Lecture Notes in Computer Science, 2006, , 62-71.	1.3	25
110	Learning probability distributions in continuous evolutionary algorithms – a comparative review. Natural Computing, 2004, 3, 77-112.	3.0	204
111	Evaluating the CMA Evolution Strategy on Multimodal Test Functions. Lecture Notes in Computer Science, 2004, , 282-291.	1.3	378
112	A Mixed Bayesian Optimization Algorithm with Variance Adaptation. Lecture Notes in Computer Science, 2004, , 352-361.	1.3	29
113	Reducing the Time Complexity of the Derandomized Evolution Strategy with Covariance Matrix Adaptation (CMA-ES). Evolutionary Computation, 2003, 11, 1-18.	3.0	1,762
114	Increasing the Serial and the Parallel Performance of the CMA-Evolution Strategy with Large Populations. Lecture Notes in Computer Science, 2002, , 422-431.	1.3	13
115	Completely Derandomized Self-Adaptation in Evolution Strategies. Evolutionary Computation, 2001, 9, 159-195.	3.0	3,292
116	Invariance, Self-Adaptation and Correlated Mutations in Evolution Strategies. Lecture Notes in Computer Science, 2000, , 355-364.	1.3	31
117	A Derandomized Approach to Self-Adaptation of Evolution Strategies. Evolutionary Computation, 1994, 2, 369-380.	3.0	151
118	Step-size adaptation based on non-local use of selection information. Lecture Notes in Computer Science, 1994, , 189-198.	1.3	100