Yun Li

List of Publications by Year
in descending order

174 papers	11,179 citations	93792 39 h-index	38517 99 g-index
178 all docs	178 docs citations	178 times ranked	9813 citing authors

#	Article	IF	Citations
1	Optimizing a stochastic disassembly line balancing problem with task failure via a hybrid variable neighborhood descent-artificial bee colony algorithm. International Journal of Production Research, 2023, 61, 2307-2321.	4.9	13
2	Gene Targeting Differential Evolution: A Simple and Efficient Method for Large-Scale Optimization. IEEE Transactions on Evolutionary Computation, 2023, 27, 964-979.	7.5	14
3	Time and space-variant system reliability analysis through adaptive Kriging and weighted sampling. Mechanical Systems and Signal Processing, 2022, 166, 108443.	4.4	19
4	Evolutionary Architectural Search for Generative Adversarial Networks. IEEE Transactions on Emerging Topics in Computational Intelligence, 2022, 6, 783-794.	3.4	9
5	Progressive sampling surrogate-assisted particle swarm optimization for large-scale expensive optimization. , 2022, , .		3
6	Active Learning Kriging Model With Adaptive Uniform Design for Time-Dependent Reliability Analysis. IEEE Access, 2021, 9, 91625-91634.	2.6	10
7	Bilevel-search particle swarm optimization for computationally expensive optimization problems. Soft Computing, 2021, 25, 14357-14374.	2.1	3
8	Mathematical Modelling for Furnace Design Refining Molten Aluminum. Metals, 2021, 11, 1798.	1.0	1
9	Improved evolutionary algorithm for parallel batch processing machine scheduling in additive manufacturing. International Journal of Production Research, 2020, 58, 2263-2282.	4.9	58
10	Paradoxes in Numerical Comparison of Optimization Algorithms. IEEE Transactions on Evolutionary Computation, 2020, 24, 777-791.	7.5	10
11	Ship Design with a Morphing Evolutionary Algorithm. , 2020, , .		1
12	An Analysis of the Allometric and Multifractal Features of a Development in the Urban-Rural Area in the Lower Reaches of the Yangtze River: 2012 Cross-Sectional Data of Four Provinces and One City. Complexity, 2020, 2020, 1-19.	0.9	4
13	Comparative studies on Evolutionary Spatial Multifractal Mechanism for built-up lands in Zhengzhou from 1988 to 2015 with the characteristics of Beijing. Journal of Cleaner Production, 2020, 269, 122451.	4.6	7
14	Time-variant reliability analysis via approximation of the first-crossing PDF. Structural and Multidisciplinary Optimization, 2020, 62, 2653-2667.	1.7	19
15	Experimental Studies of Tail Shapes for Hummingbird-Like Flapping Wing Micro Air Vehicles. IEEE Access, 2020, 8, 52622-52630.	2.6	3
16	Look-ahead natural evolutionary strategies. , 2020, , .		0
17	Evolutionary Computation Automated Design of Ship Hull Forms for the Industry 4.0 Era. , 2019, , .		2
18	Battery Remaining Useful Life Prediction with Inheritance Particle Filtering. Energies, 2019, 12, 2784.	1.6	29

#	Article	IF	Citations
19	Benchmarks for Evaluating Optimization Algorithms and Benchmarking MATLAB Derivative-Free Optimizers for Practitioners' Rapid Access. IEEE Access, 2019, 7, 79657-79670.	2.6	11
20	How firms in emerging economies can learn industry 4.0 by extracting knowledge from their foreign partners? A view point from strategic management perspective. , 2019, , .		3
21	Intelligent Autonomous Pollination for Future Farming - A Micro Air Vehicle Conceptual Framework With Artificial Intelligence and Human-in-the-Loop. IEEE Access, 2019, 7, 119706-119717.	2.6	29
22	A decomposition based evolutionary algorithm with direction vector adaption and selection enhancement. Information Sciences, 2019, 501, 248-271.	4.0	20
23	Long-Term Routing Stability of Wireless Sensor Networks in a Real-World Environment. IEEE Access, 2019, 7, 74351-74360.	2.6	9
24	Intelligent swarm firefly algorithm for the prediction of China's national electricity consumption. International Journal of Bio-Inspired Computation, 2019, 13, 111.	0.6	9
25	Parallel transfer evolution algorithm. Applied Soft Computing Journal, 2019, 75, 686-701.	4.1	4
26	Smart manufacturing based on cyber-physical systems and beyond. Journal of Intelligent Manufacturing, 2019, 30, 2805-2817.	4.4	173
27	Review of active noise control techniques with emphasis on sound quality enhancement. Applied Acoustics, 2018, 136, 139-148.	1.7	42
28	Powder distribution on powder injection moulding of ceramic green compacts using thermogravimetric analysis and differential scanning calorimetry. Powder Technology, 2018, 328, 256-263.	2.1	13
29	An adaptive multi-population differential artificial bee colony algorithm for many-objective service composition in cloud manufacturing. Information Sciences, 2018, 456, 50-82.	4.0	92
30	Spatio-temporal evolutionary analysis of the township enterprises of Beijing suburbs using computational intelligence assisted design framework. Palgrave Communications, 2018, 4, .	4.7	11
31	An Energy Efficient Ant Colony System for Virtual Machine Placement in Cloud Computing. IEEE Transactions on Evolutionary Computation, 2018, 22, 113-128.	7.5	306
32	A Level-Based Learning Swarm Optimizer for Large-Scale Optimization. IEEE Transactions on Evolutionary Computation, 2018, 22, 578-594.	7.5	212
33	Simplex Search-Based Brain Storm Optimization. IEEE Access, 2018, 6, 75997-76006.	2.6	7
34	Robust Design for the Lower Extremity Exoskeleton Under a Stochastic Terrain by Mimicking Wolf Pack Behaviors. IEEE Access, 2018, 6, 30714-30725.	2.6	15
35	Two Possible Paradoxes in Numerical Comparisons of Optimization Algorithms. Lecture Notes in Computer Science, 2018, , 681-692.	1.0	1
36	Multimodal Estimation of Distribution Algorithms. IEEE Transactions on Cybernetics, 2017, 47, 636-650.	6.2	153

#	Article	IF	Citations
37	Molecular dynamics simulation of persistent slip bands formation in nickel-base superalloys. International Journal of Automation and Computing, 2017, 14, 68-79.	4.5	3
38	Grey-Box Modeling for Photo-Voltaic Power Systems Using Dynamic Neural-Networks. , 2017, , .		2
39	Understanding spatial related network challenges from physical and network layers. , 2017, , .		0
40	Effect of Packaging Architecture on the Optical and Thermal Performances of High-Power Light Emitting Diodes. Journal of Electronic Packaging, Transactions of the ASME, 2017, 139, .	1.2	3
41	Particle filter track-before-detect algorithm with Lamarckian inheritance for improved dim target tracking. , 2017, , .		1
42	Flexible genetic algorithm: A simple and generic approach to node placement problems. Applied Soft Computing Journal, 2017, 52, 457-470.	4.1	23
43	Segment-Based Predominant Learning Swarm Optimizer for Large-Scale Optimization. IEEE Transactions on Cybernetics, 2017, 47, 2896-2910.	6.2	131
44	Cloudde: A Heterogeneous Differential Evolution Algorithm and Its Distributed Cloud Version. IEEE Transactions on Parallel and Distributed Systems, 2017, 28, 704-716.	4.0	139
45	Survey on artificial intelligence for additive manufacturing. , 2017, , .		25
46	Energy-Efficient Through-Life Smart Design, Manufacturing and Operation of Ships in an Industry 4.0 Environment. Energies, 2017, 10, 610.	1.6	86
47	Examining the Feasibilities of Industry 4.0 for the Hospitality Sector with the Lens of Management Practice. Energies, 2017, 10, 499.	1.6	87
48	Adaptive Multimodal Continuous Ant Colony Optimization. IEEE Transactions on Evolutionary Computation, 2017, 21, 191-205.	7.5	242
49	A Simple Brain Storm Optimization Algorithm via Visualizing Confidence Intervals. Lecture Notes in Computer Science, 2017, , 27-38.	1.0	2
50	Univariate Gaussian Model for Multimodal Inseparable Problems. Lecture Notes in Computer Science, 2017, , 612-623.	1.0	4
51	Generalized Hybrid Evolutionary Algorithm Framework with a Mutation Operator Requiring no Adaptation. Lecture Notes in Computer Science, 2017, , 486-498.	1.0	0
52	Wind tunnel experiments of novel wing configurations for design and customisation in an industry 4.0 environment. , 2016, , .		1
53	Pareto-optimality solution recommendation using a multi-objective artificial wolf-pack algorithm. , 2016, , .		4
54	Smart design for ships in a smart product through-life and industry 4.0 environment. , 2016, , .		15

#	Article	IF	Citations
55	Particle filter with Lamarckian inheritance for nonlinear filtering. , 2016, , .		3
56	Effects of humidity on the electro-optical-thermal characteristics of high-power LEDs. , 2016, , .		0
57	Heuristic grey-box modelling for photovoltaic power systems. Systems Science and Control Engineering, 2016, 4, 235-246.	1.8	4
58	Predicting types of failures in wireless sensor networks using an adaptive neuro-fuzzy inference system. , 2016, , .		0
59	Self-organizing tool for smart design with predictive customer needs and wants to realize Industry 4.0. , 2016, , .		15
60	Management approaches for Industry 4.0: A human resource management perspective. , 2016, , .		156
61	Topology selection for particle swarm optimization. Information Sciences, 2016, 363, 154-173.	4.0	74
62	A closed-form method for single-point positioning with six satellites in dual-GNSS constellations. Advances in Space Research, 2016, 58, 2280-2286.	1.2	4
63	Heuristic search towards the invention of an optimal-ignition internal combustion engine. , 2016, , .		0
64	Implications of Phosphor Coating on the Thermal Characteristics of Phosphor-Converted White LEDs. IEEE Transactions on Device and Materials Reliability, 2016, 16, 576-582.	1.5	4
65	A Maximal Clique Based Multiobjective Evolutionary Algorithm for Overlapping Community Detection. IEEE Transactions on Evolutionary Computation, 2016, , 1-1.	7.5	48
66	Speciation and diversity balance for Genetic Algorithms and application to structural neural network learning. , 2016, , .		3
67	Benchmarking heuristic search and optimisation algorithms in Matlab. , 2016, , .		6
68	Identifying smart design attributes for Industry 4.0 customization using a clustering Genetic Algorithm. , 2016, , .		9
69	Machine Learning with Sensitivity Analysis to Determine Key Factors Contributing to Energy Consumption in Cloud Data Centers. , 2016, , .		6
70	Set-based particle swarm optimization for mapping and scheduling tasks on heterogeneous embedded systems. , 2016, , .		4
71	Particle swarm optimization with Monte-Carlo simulation and hypothesis testing for network reliability problem. , 2016, , .		0
72	Kuhnâ€"Munkres Parallel Genetic Algorithm for the Set Cover Problem and Its Application to Large-Scale Wireless Sensor Networks. IEEE Transactions on Evolutionary Computation, 2016, 20, 695-710.	7.5	84

#	Article	IF	Citations
73	Fast Micro-Differential Evolution for Topological Active Net Optimization. IEEE Transactions on Cybernetics, 2016, 46, 1411-1423.	6.2	23
74	Genetic Learning Particle Swarm Optimization. IEEE Transactions on Cybernetics, 2016, 46, 2277-2290.	6.2	426
75	Attribute identification and predictive customisation using fuzzy clustering and genetic search for Industry 4.0 environments. , 2016, , .		5
76	Evolutionary Neural Network Modeling for Energy Prediction of Cloud Data Centers. , 2016, , .		2
77	Micromechanics model for predicting effective elastic moduli of porous ceramic matrices with randomly oriented carbon nanotube reinforcements. AIP Advances, 2015, 5, .	0.6	11
78	Computational Intelligence Approaches to Robotics, Automation, and Control. Mathematical Problems in Engineering, 2015, 2015, 1-1.	0.6	1
79	Distributed evolutionary algorithms and their models: A survey of the state-of-the-art. Applied Soft Computing Journal, 2015, 34, 286-300.	4.1	361
80	Computational investigation of superalloy persistent slip bands formation. , 2015, , .		0
81	Cash flow prediction using a grey-box model. , 2015, , .		1
82	Evolutionary Neural Network Based Energy Consumption Forecast for Cloud Computing. , 2015, , .		16
83	Key challenges and opportunities in hull form design optimisation for marine and offshore applications. , 2015, , .		2
84	Achieving accurate electro-optical-thermal measurements of high-power LEDs. , 2015, , .		2
85	Deadline Constrained Cloud Computing Resources Scheduling through an Ant Colony System Approach. , 2015, , .		34
86	Industry 4.0 with cyber-physical integration: A design and manufacture perspective. , 2015, , .		55
87	Cash flow forecast for South African firms. Review of Development Finance, 2015, 5, 24-33.	2.6	7
88	Cloud Computing Resource Scheduling and a Survey of Its Evolutionary Approaches. ACM Computing Surveys, 2015, 47, 1-33.	16.1	366
89	An Evolutionary Algorithm with Double-Level Archives for Multiobjective Optimization. IEEE Transactions on Cybernetics, 2015, 45, 1851-1863.	6.2	52
90	Dynamic performance of IEEE 802.15.4 devices under persistent WiFi traffic. , 2015, , .		7

#	Article	IF	Citations
91	Grey-box identification for photovoltaic power systems via particle-swarm algorithm. , 2015, , .		2
92	Survey of greener ignition and combustion systems for internal combustion engines. , 2015, , .		0
93	Differential Evolution with an Evolution Path: A DEEP Evolutionary Algorithm. IEEE Transactions on Cybernetics, 2015, 45, 1798-1810.	6.2	134
94	BAYESIAN PREDICTION WITH LINEAR DYNAMIC MODEL: PRINCIPLE AND APPLICATION. , 2015, , 323-342.		0
95	Bi-Velocity Discrete Particle Swarm Optimization and Its Application to Multicast Routing Problem in Communication Networks. IEEE Transactions on Industrial Electronics, 2014, 61, 7141-7151.	5.2	106
96	Heuristically enhanced dynamic neural networks for structurally improving photovoltaic power forecasting. , 2014, , .		5
97	Merging pedagogical approaches: University of Glasgow-UESTC joint education programme in electronics and electrical engineering. , 2014, , .		0
98	From the social learning theory to a social learning algorithm for global optimization. , 2014, , .		8
99	A Differential Evolution Algorithm With Dual Populations for Solving Periodic Railway Timetable Scheduling Problem. IEEE Transactions on Evolutionary Computation, 2013, 17, 512-527.	7.5	118
100	Particle Swarm Optimization With an Aging Leader and Challengers. IEEE Transactions on Evolutionary Computation, 2013, 17, 241-258.	7.5	598
101	An Ant Colony Optimization Approach for Maximizing the Lifetime of Heterogeneous Wireless Sensor Networks. IEEE Transactions on Systems, Man and Cybernetics, Part C: Applications and Reviews, 2012, 42, 408-420.	3.3	123
102	Forecasting of photovoltaic power yield using dynamic neural networks. , 2012, , .		21
103	An Efficient Resource Allocation Scheme Using Particle Swarm Optimization. IEEE Transactions on Evolutionary Computation, 2012, 16, 801-816.	7.5	117
104	Evolutionary Computation Meets Machine Learning: A Survey. IEEE Computational Intelligence Magazine, 2011, 6, 68-75.	3.4	204
105	Orthogonal Learning Particle Swarm Optimization. IEEE Transactions on Evolutionary Computation, 2011, 15, 832-847.	7.5	620
106	Detection of rpoB, katG and inhA gene mutations in Mycobacterium tuberculosis clinical isolates from Chongqing as determined by microarray. Clinical Microbiology and Infection, 2010, 16, 1639-1643.	2.8	42
107	SamACO: Variable Sampling Ant Colony Optimization Algorithm for Continuous Optimization. IEEE Transactions on Systems, Man, and Cybernetics, 2010, 40, 1555-1566.	5.5	61
108	An Efficient Ant Colony System Based on Receding Horizon Control for the Aircraft Arrival Sequencing and Scheduling Problem. IEEE Transactions on Intelligent Transportation Systems, 2010, 11, 399-412.	4.7	129

#	Article	IF	Citations
109	Adaptive Particle Swarm Optimization. IEEE Transactions on Systems, Man, and Cybernetics, 2009, 39, 1362-1381.	5.5	1,549
110	Orthogonal Methods Based Ant Colony Search for Solving Continuous Optimization Problems. Journal of Computer Science and Technology, 2008, 23, 2-18.	0.9	97
111	Erratum to â€œStructures, stabilities and tautomerizations of uracil and diphosphouracil tautomersâ€• [Chem. Phys. 332 (2007) 152â€"161]. Chemical Physics, 2008, 348, 254.	0.9	0
112	Microbubble Suspensions Prepared via Electrohydrodynamic Jetting Process. , 2008, , .		0
113	Solar Cell Modeling and Parameter Optimization Using Simulated Annealing. Journal of Propulsion and Power, 2008, 24, 1018-1022.	1.3	20
114	Protein Folding in Hydrophobic-Polar Lattice Model: A Flexible Ant-Colony Optimization Approach. Protein and Peptide Letters, 2008, 15, 469-477.	0.4	28
115	Flexible Protein Folding by Ant Colony Optimization. Studies in Computational Intelligence, 2008, , 317-336.	0.7	7
116	Evolutionary computation enabled game theory based modelling of electricity market behaviours and applications. , 2007, , .		1
117	Patents, software, and hardware for PID control: an overview and analysis of the current art. IEEE Control Systems, 2006, 26, 42-54.	1.0	129
118	Spacecraft Power Subsystem Technology Selection. , 2006, , .		2
119	PID control system analysis and design. IEEE Control Systems, 2006, 26, 32-41.	1.0	373
120	Multi-Objective Optimization of Spacecraft Electrical Power Subsystem Design/Sizing. , 2006, , .		0
121	Continuous Function Optimization Using Hybrid Ant Colony Approach with Orthogonal Design Scheme. Lecture Notes in Computer Science, 2006, , 126-133.	1.0	8
122	PID control system analysis, design, and technology. IEEE Transactions on Control Systems Technology, 2005, 13, 559-576.	3.2	1,993
123	High-order Volterra Model Predictive Control and its application to a nonlinear polymerisation process. International Journal of Automation and Computing, 2005, 2, 208-214.	4.5	12
124	Nonparametric nonlinear model predictive control. Korean Journal of Chemical Engineering, 2004, 21, 329-337.	1.2	6
125	CAutoCSD-evolutionary search and optimisation enabled computer automated control system design. International Journal of Automation and Computing, 2004, 1, 76-88.	4.5	32
126	VISUALIZATION TECHNIQUE FOR ANALYZING NON-DOMINANT PARETO OPTIMALITY. Advances in Natural Computation, 2004, , 327-346.	0.1	0

#	Article	IF	Citations
127	Grey-box model identification via evolutionary computing. Control Engineering Practice, 2002, 10, 673-684.	3.2	45
128	An Overview of Benchmarking Techniques for Multi-Objective Evolutionary Algorithms. , 2002, , 337-348.		2
129	Performance-based control system design automation via evolutionary computing. Engineering Applications of Artificial Intelligence, 2001, 14, 473-486.	4.3	22
130	Ship steering control system optimisation using genetic algorithms. Control Engineering Practice, 2000, 8, 429-443.	3.2	90
131	Linear approximation model network and its formation via evolutionary computation. Sadhana - Academy Proceedings in Engineering Sciences, 2000, 25, 97-110.	0.8	3
132	Evolutionary Lâˇž identification and model reduction for robust control. Proceedings of the Institution of Mechanical Engineers Part I: Journal of Systems and Control Engineering, 2000, 214, 231-238.	0.7	4
133	The optimization of a tanker autopilot control system using genetic algorithms. Transactions of the Institute of Measurement and Control, 2000, 22, 141-178.	1.1	24
134	The optimization of a tanker autopilot control system using genetic algorithms. Transactions of the Institute of Measurement and Control, 2000, 22, 141-178.	1.1	5
135	Benchmarking Cost-Assignment Schemes for Multi-objective Evolutionary Algorithms. Lecture Notes in Computer Science, 2000, , 158-167.	1.0	0
136	Trajectory Controller Network and Its Design Automation through Evolutionary Computing. Lecture Notes in Computer Science, 2000, , 139-146.	1.0	1
137	Time Series Prediction by Growing Lateral Delay Neural Networks. Lecture Notes in Computer Science, 2000, , 127-138.	1.0	4
138	Learning fuzzy control by evolutionary and advantage reinforcements. International Journal of Intelligent Systems, 1998, 13, 949-974.	3.3	5
139	Nonlinear model structure identification using genetic programming. Control Engineering Practice, 1998, 6, 1341-1352.	3.2	123
140	Learning fuzzy control by evolutionary and advantage reinforcements. International Journal of Intelligent Systems, 1998, 13, 949-974.	3.3	0
141	Evolutionary system identification in the time domain. Proceedings of the Institution of Mechanical Engineers Part I: Journal of Systems and Control Engineering, 1997, 211, 319-323.	0.7	7
142	Multi-Objective Genetic Algorithm Based Time and Frequency Domain Design Unification of Linear Control Systems. IFAC Postprint Volumes IPPV / International Federation of Automatic Control, 1997, 30, 35-40.	0.4	5
143	Global Structure Evolution and Local Parameter Learning for Control System Model Reductions. , 1997, , 345-360.		11
144	Structural system identification using genetic programming and a block diagram oriented simulation tool. Electronics Letters, 1996, 32, 1422.	0.5	46

#	Article	IF	Citations
145	Artificial evolution of neural networks and its application to feedback control. Advanced Engineering Informatics, 1996, 10, 143-152.	0.5	33
146	Evolutionary linearisation in the frequency domain. Electronics Letters, 1996, 32, 74.	0.5	13
147	Genetic algorithm automated approach to the design of sliding mode control systems. International Journal of Control, 1996, 63, 721-739.	1.2	63
148	Submarine sliding mode controller optimisation using genetic algorithms. , 1996, , .		8
149	Direct design of uniform LTI controllers from plant I/O data using a parallel evolutionary algorithm. , 1996, , .		0
150	Automation of Linear and Nonlinear Control Systems Design by Evolutionary Computation. IFAC Postprint Volumes IPPV / International Federation of Automatic Control, 1995, 28, 85-90.	0.4	2
151	Genetic algorithms applied to fuzzy sliding mode controller design. , 1995, , .		34
152	Neurocontrollers designed by a genetic algorithm. , 1995, , .		4
153	Evolving signal processing algorithms by genetic programming. , 1995, , .		27
154	Graph reversal and the design of parallel control and signal processing architectures. International Journal of Control, 1995, 62, 271-287.	1.2	1
155	Specification of a control system fitness function using constraints for genetic algorithm based design methods. , 1995, , .		10
156	Parallel processing in a control systems environment. Control Engineering Practice, 1994, 2, 925-926.	3.2	0
157	The Reversed Computation Graph and the Design of Parallel Control Architectures. IFAC Postprint Volumes IPPV / International Federation of Automatic Control, 1993, 26, 629-632.	0.4	0
158	Mapping systolic structures onto transputer/AlOO based parallel processors for adaptive/self-tuning control. International Journal of Control, 1991, 54, 1399-1411.	1.2	1
159	CONCURRENT ARRAY PROCESSING FOR LINEAR MULTIVARIABLE FEEDBACK CONTROL SYSTEMS. , 1990, , 403-407.		0
160	SYSTOLIC ARRAY INFORMATION PROCESSING STRATEGY FOR REAL-TIME AUTOMATIC CONTROL. , 1990, , 295-300.		0
161	Systolic array based concurrent processing for real-time high performance control. , 0, , .		5
162	Design of sophisticated fuzzy logic controllers using genetic algorithms. , 0, , .		30

#	Article	IF	Citations
163	Performance based linear control system design by genetic evolution with simulated annealing. , 0, , .		6
164	Messy genetic algorithm based new learning method for structurally optimised neurofuzzy controllers. , 0, , .		6
165	Non-linear tanker control system parameter optimisation using genetic algorithms. , 0, , .		1
166	Performance indices in evolutionary CACSD automation with application to batch PID generation. , 0, , .		8
167	Genetic algorithm enabled computer-automated design of QFT control systems. , 0, , .		19
168	Evolving trajectory controller networks from linear approximation model networks. , 0, , .		3
169	Dynamic modelling and time-series prediction by incremental growth of lateral delay neural networks. , 0, , .		2
170	Linear approximation model network and its formation via evolutionary computation. , 0, , .		0
171	GA automated design and synthesis of analog circuits with practical constraints. , 0, , .		58
172	Tractable neurocontroller design and application to ship control with actuator limits. , 0, , .		0
173	Soft computing based networking technique and its application to control system design and identification. , 0, , .		0
174	Preliminary statement on the current progress of multi-objective evolutionary algorithm performance measurement. , 0, , .		2