

# Oscar Castillo

## List of Publications by Year in descending order

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867  
papers

19,405  
citations

9234

74  
h-index

22102

113  
g-index

1009  
all docs

1009  
docs citations

1009  
times ranked

7700  
citing authors

#	ARTICLE	IF	CITATIONS
1	A comparative study of type-1 fuzzy logic systems, interval type-2 fuzzy logic systems and generalized type-2 fuzzy logic systems in control problems. Information Sciences, 2016, 354, 257-274.	4.0	346
2	Type-2 Fuzzy Logic: Theory and Applications. Studies in Fuzziness and Soft Computing, 2008, , .	0.6	344
3	Path planning for autonomous mobile robot navigation with ant colony optimization and fuzzy cost function evaluation. Applied Soft Computing Journal, 2009, 9, 1102-1110.	4.1	334
4	Optimization of interval type-2 fuzzy logic controllers for a perturbed autonomous wheeled mobile robot using genetic algorithms. Information Sciences, 2009, 179, 2158-2174.	4.0	307
5	A review on the design and optimization of interval type-2 fuzzy controllers. Applied Soft Computing Journal, 2012, 12, 1267-1278.	4.1	306
6	A hybrid learning algorithm for a class of interval type-2 fuzzy neural networks. Information Sciences, 2009, 179, 2175-2193.	4.0	261
7	Generalized Type-2 Fuzzy Systems for controlling a mobile robot and a performance comparison with Interval Type-2 and Type-1 Fuzzy Systems. Expert Systems With Applications, 2015, 42, 5904-5914.	4.4	251
8	Optimal design of fuzzy classification systems using PSO with dynamic parameter adaptation through fuzzy logic. Expert Systems With Applications, 2013, 40, 3196-3206.	4.4	243
9	Comparative study of bio-inspired algorithms applied to the optimization of type-1 and type-2 fuzzy controllers for an autonomous mobile robot. Information Sciences, 2012, 192, 19-38.	4.0	234
10	A review on interval type-2 fuzzy logic applications in intelligent control. Information Sciences, 2014, 279, 615-631.	4.0	234
11	Experimental study of intelligent controllers under uncertainty using type-1 and type-2 fuzzy logic. Information Sciences, 2007, 177, 2023-2048.	4.0	226
12	Edge-Detection Method for Image Processing Based on Generalized Type-2 Fuzzy Logic. IEEE Transactions on Fuzzy Systems, 2014, 22, 1515-1525.	6.5	222
13	A review on type-2 fuzzy logic applications in clustering, classification and pattern recognition. Applied Soft Computing Journal, 2014, 21, 568-577.	4.1	216
14	A generalized type-2 fuzzy granular approach with applications to aerospace. Information Sciences, 2016, 354, 165-177.	4.0	204
15	An improved evolutionary method with fuzzy logic for combining Particle Swarm Optimization and Genetic Algorithms. Applied Soft Computing Journal, 2011, 11, 2625-2632.	4.1	196
16	A fuzzy hierarchical operator in the grey wolf optimizer algorithm. Applied Soft Computing Journal, 2017, 57, 315-328.	4.1	173
17	Type-2 fuzzy logic aggregation of multiple fuzzy controllers for airplane flight control. Information Sciences, 2015, 324, 247-256.	4.0	165
18	Hybrid intelligent systems for time series prediction using neural networks, fuzzy logic, and fractal theory. IEEE Transactions on Neural Networks, 2002, 13, 1395-1408.	4.8	164

#	ARTICLE	IF	CITATIONS
19	A new approach for dynamic fuzzy logic parameter tuning in Ant Colony Optimization and its application in fuzzy control of a mobile robot. <i>Applied Soft Computing Journal</i> , 2015, 28, 150-159.	4.1	162
20	A comprehensive review on type 2 fuzzy logic applications: Past, present and future. <i>Engineering Applications of Artificial Intelligence</i> , 2020, 95, 103916.	4.3	162
21	An improved sobel edge detection method based on generalized type-2 fuzzy logic. <i>Soft Computing</i> , 2016, 20, 773-784.	2.1	158
22	Optimization of type-2 fuzzy systems based on bio-inspired methods: A concise review. <i>Information Sciences</i> , 2012, 205, 1-19.	4.0	156
23	A new approach for time series prediction using ensembles of ANFIS models. <i>Expert Systems With Applications</i> , 2012, 39, 3494-3506.	4.4	156
24	Ant colony optimization with dynamic parameter adaptation based on interval type-2 fuzzy logic systems. <i>Applied Soft Computing Journal</i> , 2017, 53, 74-87.	4.1	145
25	An improved method for edge detection based on interval type-2 fuzzy logic. <i>Expert Systems With Applications</i> , 2010, 37, 8527-8535.	4.4	141
26	Optimization of modular granular neural networks using a firefly algorithm for human recognition. <i>Engineering Applications of Artificial Intelligence</i> , 2017, 64, 172-186.	4.3	139
27	Information granule formation via the concept of uncertainty-based information with Interval Type-2 Fuzzy Sets representation and Takagi-Sugeno-Kang consequents optimized with Cuckoo search. <i>Applied Soft Computing Journal</i> , 2015, 27, 602-609.	4.1	138
28	Particle swarm optimization of interval type-2 fuzzy systems for FPGA applications. <i>Applied Soft Computing Journal</i> , 2013, 13, 496-508.	4.1	136
29	Optimization of interval type-2 fuzzy systems for image edge detection. <i>Applied Soft Computing Journal</i> , 2016, 47, 631-643.	4.1	136
30	Optimal design of type-2 and type-1 fuzzy tracking controllers for autonomous mobile robots under perturbed torques using a new chemical optimization paradigm. <i>Expert Systems With Applications</i> , 2013, 40, 3185-3195.	4.4	131
31	A review on the applications of type-2 fuzzy logic in classification and pattern recognition. <i>Expert Systems With Applications</i> , 2013, 40, 5413-5423.	4.4	129
32	Multiple Ensemble Neural Network Models with Fuzzy Response Aggregation for Predicting COVID-19 Time Series: The Case of Mexico. <i>Healthcare (Switzerland)</i> , 2020, 8, 181.	1.0	128
33	Optimization of type-2 fuzzy weights in backpropagation learning for neural networks using GAs and PSO. <i>Applied Soft Computing Journal</i> , 2016, 38, 860-871.	4.1	125
34	Optimization of fuzzy controller design using a new bee colony algorithm with fuzzy dynamic parameter adaptation. <i>Applied Soft Computing Journal</i> , 2016, 43, 131-142.	4.1	124
35	High order $\int_{\pm} \text{planes}$ integration: A new approach to computational cost reduction of General Type-2 Fuzzy Systems. <i>Engineering Applications of Artificial Intelligence</i> , 2018, 74, 186-197.	4.3	123
36	An optimization method for designing type-2 fuzzy inference systems based on the footprint of uncertainty using genetic algorithms. <i>Expert Systems With Applications</i> , 2012, 39, 4590-4598.	4.4	122

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37	Interval type-2 fuzzy weight adjustment for backpropagation neural networks with application in time series prediction. <i>Information Sciences</i> , 2014, 260, 1-14.	4.0	122
38	A new multi-stable fractional-order four-dimensional system with self-excited and hidden chaotic attractors: Dynamic analysis and adaptive synchronization using a novel fuzzy adaptive sliding mode control method. <i>Applied Soft Computing Journal</i> , 2020, 87, 105943.	4.1	120
39	Analysis of Spatial Spread Relationships of Coronavirus (COVID-19) Pandemic in the World using Self Organizing Maps. <i>Chaos, Solitons and Fractals</i> , 2020, 138, 109917.	2.5	120
40	Face Recognition With an Improved Interval Type-2 Fuzzy Logic Sugeno Integral and Modular Neural Networks. <i>IEEE Transactions on Systems, Man and Cybernetics, Part A: Systems and Humans</i> , 2011, 41, 1001-1012.	3.4	118
41	Optimization of interval type-2 fuzzy logic controllers using evolutionary algorithms. <i>Soft Computing</i> , 2011, 15, 1145-1160.	2.1	117
42	A generalized type-2 fuzzy logic approach for dynamic parameter adaptation in bee colony optimization applied to fuzzy controller design. <i>Information Sciences</i> , 2018, 460-461, 476-496.	4.0	117
43	A new neural network model based on the LVQ algorithm for multi-class classification of arrhythmias. <i>Information Sciences</i> , 2014, 279, 483-497.	4.0	115
44	Interval type-2 fuzzy logic for dynamic parameter adaptation in a modified gravitational search algorithm. <i>Information Sciences</i> , 2019, 476, 159-175.	4.0	115
45	Dynamic parameter adaptation in particle swarm optimization using interval type-2 fuzzy logic. <i>Soft Computing</i> , 2016, 20, 1057-1070.	2.1	114
46	Hybrid Intelligent Systems for Pattern Recognition Using Soft Computing. <i>Studies in Fuzziness and Soft Computing</i> , 2005, , .	0.6	114
47	Fuzzy granular gravitational clustering algorithm for multivariate data. <i>Information Sciences</i> , 2014, 279, 498-511.	4.0	113
48	A survey on nature-inspired optimization algorithms with fuzzy logic for dynamic parameter adaptation. <i>Expert Systems With Applications</i> , 2014, 41, 6459-6466.	4.4	112
49	Particle swarm optimization of ensemble neural networks with fuzzy aggregation for time series prediction of the Mexican Stock Exchange. <i>Information Sciences</i> , 2014, 280, 188-204.	4.0	112
50	Multiple Objective Genetic Algorithms for Path-planning Optimization in Autonomous Mobile Robots. <i>Soft Computing</i> , 2006, 11, 269-279.	2.1	111
51	Genetic optimization of modular neural networks with fuzzy response integration for human recognition. <i>Information Sciences</i> , 2012, 197, 1-19.	4.0	110
52	Design of interval type-2 fuzzy models through optimal granularity allocation. <i>Applied Soft Computing Journal</i> , 2011, 11, 5590-5601.	4.1	107
53	Designing Type-1 and Type-2 Fuzzy Logic Controllers via Fuzzy Lyapunov Synthesis for nonsmooth mechanical systems. <i>Engineering Applications of Artificial Intelligence</i> , 2012, 25, 971-979.	4.3	105
54	Finite-interval-valued Type-2 Gaussian fuzzy numbers applied to fuzzy TODIM in a healthcare problem. <i>Engineering Applications of Artificial Intelligence</i> , 2020, 87, 103352.	4.3	100

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55	An Interval Type-2 Fuzzy Logic Toolbox for Control Applications. IEEE International Conference on Fuzzy Systems, 2007, , .	0.0	99
56	Application of interval type-2 fuzzy neural networks in non-linear identification and time series prediction. Soft Computing, 2014, 18, 1213-1224.	2.1	99
57	An intelligent hybrid approach for industrial quality control combining neural networks, fuzzy logic and fractal theory. Information Sciences, 2007, 177, 1543-1557.	4.0	97
58	Forecasting of COVID-19 time series for countries in the world based on a hybrid approach combining the fractal dimension and fuzzy logic. Chaos, Solitons and Fractals, 2020, 140, 110242.	2.5	96
59	Fuzzy logic control with genetic membership function parameters optimization for the output regulation of a servomechanism with nonlinear backlash. Expert Systems With Applications, 2010, 37, 4368-4378.	4.4	93
60	Adaptive intelligent control of aircraft systems with a hybrid approach combining neural networks, fuzzy logic and fractal theory. Applied Soft Computing Journal, 2003, 3, 353-362.	4.1	92
61	Simulation of the bird age-structured population growth based on an interval type-2 fuzzy cellular structure. Information Sciences, 2011, 181, 519-535.	4.0	92
62	Embedding a high speed interval type-2 fuzzy controller for a real plant into an FPGA. Applied Soft Computing Journal, 2012, 12, 988-998.	4.1	92
63	Hybrid intelligent system for cardiac arrhythmia classification with Fuzzy K-Nearest Neighbors and neural networks combined with a fuzzy system. Expert Systems With Applications, 2012, 39, 2947-2955.	4.4	92
64	Intelligent control of complex electrochemical systems with a neuro-fuzzy-genetic approach. IEEE Transactions on Industrial Electronics, 2001, 48, 951-955.	5.2	88
65	Early diagnosis of COVID-19-affected patients based on X-ray and computed tomography images using deep learning algorithm. Soft Computing, 2023, 27, 2635-2643.	2.1	87
66	Intelligent control of a stepping motor drive using a hybrid neuro-fuzzy ANFIS approach. Applied Soft Computing Journal, 2003, 3, 209-219.	4.1	86
67	Type-2 Fuzzy Logic: Theory and Applications. , 2007, , .		86
68	Type-1 and type-2 fuzzy inference systems as integration methods in modular neural networks for multimodal biometry and its optimization with genetic algorithms. Information Sciences, 2009, 179, 2123-2145.	4.0	85
69	Systematic design of a stable type-2 fuzzy logic controller. Applied Soft Computing Journal, 2008, 8, 1274-1279.	4.1	84
70	Interval type-2 fuzzy logic and modular neural networks for face recognition applications. Applied Soft Computing Journal, 2009, 9, 1377-1387.	4.1	84
71	A hybrid modular neural network architecture with fuzzy Sugeno integration for time series forecasting. Applied Soft Computing Journal, 2007, 7, 1217-1226.	4.1	82
72	Modular Neural Networks architecture optimization with a new nature inspired method using a fuzzy combination of Particle Swarm Optimization and Genetic Algorithms. Information Sciences, 2014, 270, 143-153.	4.0	82

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73	Human evolutionary model: A new approach to optimization. Information Sciences, 2007, 177, 2075-2098.	4.0	81
74	Comparative study of interval Type-2 and general Type-2 fuzzy systems in medical diagnosis. Information Sciences, 2020, 525, 37-53.	4.0	79
75	Soft Computing for Control of Non-Linear Dynamical Systems. Studies in Fuzziness and Soft Computing, 2001, , .	0.6	78
76	A Grey Wolf Optimizer for Modular Granular Neural Networks for Human Recognition. Computational Intelligence and Neuroscience, 2017, 2017, 1-26.	1.1	78
77	Intelligent adaptive model-based control of robotic dynamic systems with a hybrid fuzzy-neural approach. Applied Soft Computing Journal, 2003, 3, 363-378.	4.1	77
78	A New Method for Adaptive Control of Non-Linear Plants Using Type-2 Fuzzy Logic and Neural Networks. International Journal of General Systems, 2004, 33, 289-304.	1.2	75
79	An Extension of the Fuzzy Possibilistic Clustering Algorithm Using Type-2 Fuzzy Logic Techniques. Advances in Fuzzy Systems, 2017, 2017, 1-23.	0.6	75
80	An Efficient Computational Method to Implement Type-2 Fuzzy Logic in Control Applications. , 2007, , 45-52.		74
81	Intelligent control of a stepping motor drive using an adaptive neuro-fuzzy inference system. Information Sciences, 2005, 170, 133-151.	4.0	73
82	Evolutionary method combining particle swarm optimization and genetic algorithms using fuzzy logic for decision making. , 2009, , .		72
83	Comparative study of the use of fuzzy logic in improving particle swarm optimization variants for mathematical functions using co-evolution. Applied Soft Computing Journal, 2017, 52, 1070-1083.	4.1	72
84	A new gravitational search algorithm using fuzzy logic to parameter adaptation. , 2013, , .		71
85	A Novel Fractional-Order Multiple-Model Type-3 Fuzzy Control for Nonlinear Systems with Unmodeled Dynamics. International Journal of Fuzzy Systems, 2021, 23, 1633-1651.	2.3	70
86	Type-2 Fuzzy Logic in Intelligent Control Applications. Studies in Fuzziness and Soft Computing, 2012, , .	0.6	68
87	Design of an interval Type-2 fuzzy model with justifiable uncertainty. Information Sciences, 2020, 513, 206-221.	4.0	68
88	A novel multi-objective evolutionary algorithm with fuzzy logic based adaptive selection of operators: FAME. Information Sciences, 2019, 471, 233-251.	4.0	67
89	Fuzzy Sets in Dynamic Adaptation of Parameters of a Bee Colony Optimization for Controlling the Trajectory of an Autonomous Mobile Robot. Sensors, 2016, 16, 1458.	2.1	64
90	Type-1 and Type-2 fuzzy logic controller design using a Hybrid PSO-GA optimization method. Information Sciences, 2014, 285, 35-49.	4.0	63

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91	New approach using ant colony optimization with ant set partition for fuzzy control design applied to the ball and beam system. <i>Information Sciences</i> , 2015, 294, 203-215.	4.0	63
92	A new fuzzy bee colony optimization with dynamic adaptation of parameters using interval type-2 fuzzy logic for tuning fuzzy controllers. <i>Soft Computing</i> , 2018, 22, 571-594.	2.1	63
93	Comparative analysis of noise robustness of type 2 fuzzy logic controllers. <i>Kybernetika</i> , 0, , 175-201.	0.0	63
94	A state of the art review of intelligent scheduling. <i>Artificial Intelligence Review</i> , 2020, 53, 501-593.	9.7	62
95	Optimization of Type-2 Fuzzy Logic Controller Design Using the GSO and FA Algorithms. <i>International Journal of Fuzzy Systems</i> , 2021, 23, 42-57.	2.3	61
96	Fuzzy higher type information granules from an uncertainty measurement. <i>Granular Computing</i> , 2017, 2, 95-103.	4.4	59
97	A New Approach to Multiple Time Series Prediction Using MIMO Fuzzy Aggregation Models with Modular Neural Networks. <i>International Journal of Fuzzy Systems</i> , 2019, 21, 1629-1648.	2.3	59
98	Comparison of particle swarm optimization variants with fuzzy dynamic parameter adaptation for modular granular neural networks for human recognition. <i>Journal of Intelligent and Fuzzy Systems</i> , 2020, 38, 3229-3252.	0.8	59
99	Review of Recent Type-2 Fuzzy Controller Applications. <i>Algorithms</i> , 2016, 9, 39.	1.2	58
100	A high-speed interval type 2 fuzzy system approach for dynamic parameter adaptation in metaheuristics. <i>Engineering Applications of Artificial Intelligence</i> , 2019, 85, 666-680.	4.3	58
101	New Methodology to Approximate Type-Reduction Based on a Continuous Root-Finding Karnik Mendel Algorithm. <i>Algorithms</i> , 2017, 10, 77.	1.2	57
102	An intuitionistic fuzzy system for time series analysis in plant monitoring and diagnosis. <i>Applied Soft Computing Journal</i> , 2007, 7, 1227-1233.	4.1	56
103	A New Approach for Time Series Prediction Using Ensembles of IT2FNN Models with Optimization of Fuzzy Integrators. <i>International Journal of Fuzzy Systems</i> , 2018, 20, 701-728.	2.3	56
104	Soft Computing and Fractal Theory for Intelligent Manufacturing. <i>Studies in Fuzziness and Soft Computing</i> , 2003, , .	0.6	56
105	Generalized type-2 fuzzy weight adjustment for backpropagation neural networks in time series prediction. <i>Information Sciences</i> , 2015, 325, 159-174.	4.0	55
106	A hybrid optimization method with PSO and GA to automatically design Type-1 and Type-2 fuzzy logic controllers. <i>International Journal of Machine Learning and Cybernetics</i> , 2015, 6, 175-196.	2.3	55
107	Designing a general type-2 fuzzy expert system for diagnosis of depression. <i>Applied Soft Computing Journal</i> , 2019, 80, 329-341.	4.1	55
108	Unsupervised Deep Learning based Variational Autoencoder Model for COVID-19 Diagnosis and Classification. <i>Pattern Recognition Letters</i> , 2021, 151, 267-274.	2.6	54



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109	Performance of a Simple Tuned Fuzzy Controller and a PID Controller on a DC Motor. , 2007, , .		53
110	Comparative Study of Type-2 Fuzzy Particle Swarm, Bee Colony and Bat Algorithms in Optimization of Fuzzy Controllers. Algorithms, 2017, 10, 101.	1.2	53
111	Dynamic Fuzzy Logic Parameter Tuning for ACO and Its Application in TSP Problems. Studies in Computational Intelligence, 2013, , 259-271.	0.7	53
112	A New Fuzzy Harmony Search Algorithm Using Fuzzy Logic for Dynamic Parameter Adaptation. Algorithms, 2016, 9, 69.	1.2	51
113	Time series prediction using ensembles of ANFIS models with genetic optimization of interval type-2 and type-1 fuzzy integrators. International Journal of Hybrid Intelligent Systems, 2014, 11, 211-226.	0.9	50
114	Optimization of modular granular neural networks using a hierarchical genetic algorithm based on the database complexity applied to human recognition. Information Sciences, 2015, 309, 73-101.	4.0	50
115	An approach for parameterized shadowed type-2 fuzzy membership functions applied in control applications. Soft Computing, 2019, 23, 3887-3901.	2.1	50
116	Comparative Study in Fuzzy Controller Optimization Using Bee Colony, Differential Evolution, and Harmony Search Algorithms. Algorithms, 2019, 12, 9.	1.2	49
117	Review of Recent Type-2 Fuzzy Image Processing Applications. Information (Switzerland), 2017, 8, 97.	1.7	48
118	Optimization of fuzzy controller design using a Differential Evolution algorithm with dynamic parameter adaptation based on Type-1 and Interval Type-2 fuzzy systems. Soft Computing, 2020, 24, 193-214.	2.1	47
119	Synchronization of fractional time-delayed financial system using a novel type-2 fuzzy active control method. Chaos, Solitons and Fractals, 2020, 136, 109768.	2.5	47
120	Interval type-2 fuzzy logic for dynamic parameter adaptation in the bat algorithm. Soft Computing, 2017, 21, 667-685.	2.1	43
121	3 Type-2 Fuzzy Logic. Studies in Fuzziness and Soft Computing, 2007, , 29-43.	0.6	42
122	Building Fuzzy Inference Systems with a New Interval Type-2 Fuzzy Logic Toolbox. , 2008, , 104-114.		42
123	Type-2 intuitionistic fuzzy matrix games based on a new distance measure: Application to biogas-plant implementation problem. Applied Soft Computing Journal, 2021, 106, 107357.	4.1	42
124	Hierarchical genetic algorithms for topology optimization in fuzzy control systems. International Journal of General Systems, 2007, 36, 575-591.	1.2	41
125	Imperialist Competitive Algorithm with Dynamic Parameter Adaptation Using Fuzzy Logic Applied to the Optimization of Mathematical Functions. Algorithms, 2017, 10, 18.	1.2	41
126	Building Fuzzy Inference Systems with the Interval Type-2 Fuzzy Logic Toolbox. , 2007, , 53-62.		40



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127	Shadowed Type-2 Fuzzy Systems for Dynamic Parameter Adaptation in Harmony Search and Differential Evolution Algorithms. <i>Algorithms</i> , 2019, 12, 17.	1.2	39
128	A Novel Method for a COVID-19 Classification of Countries Based on an Intelligent Fuzzy Fractal Approach. <i>Healthcare (Switzerland)</i> , 2021, 9, 196.	1.0	38
129	Interval Type-2 TSK Fuzzy Logic Systems Using Hybrid Learning Algorithm. , 0, , .		37
130	A Hybrid Approach for Modular Neural Network Design Using Intercriteria Analysis and Intuitionistic Fuzzy Logic. <i>Complexity</i> , 2018, 2018, 1-11.	0.9	37
131	Optimal design of interval type 2 fuzzy controllers based on a simple tuning algorithm. <i>Applied Soft Computing Journal</i> , 2014, 23, 270-285.	4.1	36
132	A new fuzzy-fractal-genetic method for automated mathematical modelling and simulation of robotic dynamic systems. , 0, , .		35
133	Special issue on "Extensions to type-1 fuzzy logic: theory, algorithms and applications" <i>Soft Computing</i> , 2020, 24, 1-2.	2.1	35
134	Generation of walking periodic motions for a biped robot via genetic algorithms. <i>Applied Soft Computing Journal</i> , 2011, 11, 5306-5314.	4.1	34
135	Grey wolf optimizer with dynamic adaptation of parameters using fuzzy logic. , 2016, , .		34
136	ClusFuDE: Forecasting low dimensional numerical data using an improved method based on automatic clustering, fuzzy relationships and differential evolution. <i>Engineering Applications of Artificial Intelligence</i> , 2018, 71, 175-189.	4.3	34
137	Fuzzy Logic in Dynamic Parameter Adaptation of Harmony Search Optimization for Benchmark Functions and Fuzzy Controllers. <i>International Journal of Fuzzy Systems</i> , 2020, 22, 1198-1211.	2.3	34
138	Fuzzy Dynamic Parameter Adaptation in the Harmony Search Algorithm for the Optimization of the Ball and Beam Controller. <i>Advances in Operations Research</i> , 2018, 2018, 1-16.	0.2	33
139	A New Meta-Heuristics of Optimization with Dynamic Adaptation of Parameters Using Type-2 Fuzzy Logic for Trajectory Control of a Mobile Robot. <i>Algorithms</i> , 2017, 10, 85.	1.2	32
140	A novel parameter estimation in dynamic model via fuzzy swarm intelligence and chaos theory for faults in wastewater treatment plant. <i>Soft Computing</i> , 2020, 24, 111-129.	2.1	32
141	A new method for adaptive model-based control of non-linear dynamic plants using a neuro-fuzzy-fractal approach. <i>Soft Computing</i> , 2001, 5, 171-177.	2.1	31
142	Ant colony test center for planning autonomous mobile robot navigation. <i>Computer Applications in Engineering Education</i> , 2013, 21, 214-229.	2.2	31
143	Optimization of Fuzzy Controller Using Galactic Swarm Optimization with Type-2 Fuzzy Dynamic Parameter Adjustment. <i>Axioms</i> , 2019, 8, 26.	0.9	31
144	Evolutionary Computing for Optimizing Type-2 Fuzzy Systems in Intelligent Control of Non-Linear Dynamic Plants. , 0, , .		30

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145	Dynamic Fuzzy Logic Parameter Tuning for ACO and Its Application in the Fuzzy Logic Control of an Autonomous Mobile Robot. <i>International Journal of Advanced Robotic Systems</i> , 2013, 10, 51.	1.3	30
146	A multi-objective optimization of type-2 fuzzy control speed in FPGAs. <i>Applied Soft Computing Journal</i> , 2014, 24, 1164-1174.	4.1	30
147	A hybrid learning method composed by the orthogonal least-squares and the back-propagation learning algorithms for interval A2-C1 type-1 non-singleton type-2 TSK fuzzy logic systems. <i>Soft Computing</i> , 2015, 19, 661-678.	2.1	30
148	Fuzzy rule-based models with interactive rules and their granular generalization. <i>Fuzzy Sets and Systems</i> , 2017, 307, 1-28.	1.6	30
149	Optimal Setting of Membership Functions for Interval Type-2 Fuzzy Tracking Controllers Using a Shark Smell Metaheuristic Algorithm. <i>International Journal of Fuzzy Systems</i> , 2022, 24, 799-822.	2.3	30
150	An Interval Type-2 Fuzzy Neural Network for Chaotic Time Series Prediction with Cross-Validation and Akaike Test. <i>Studies in Computational Intelligence</i> , 2010, , 269-285.	0.7	30
151	DEVELOPING A NEW METHOD FOR THE IDENTIFICATION OF MICROORGANISMS FOR THE FOOD INDUSTRY USING THE FRACTAL DIMENSION. <i>Fractals</i> , 1994, 02, 457-460.	1.8	29
152	Face recognition using modular neural networks and the fuzzy Sugeno integral for response integration. <i>International Journal of Intelligent Systems</i> , 2005, 20, 275-291.	3.3	29
153	Fuzzy dynamic parameters adaptation in the Cuckoo Search Algorithm using fuzzy logic. , 2015, , .		29
154	Edge Detection Method Based on General Type-2 Fuzzy Logic Applied to Color Images. <i>Information (Switzerland)</i> , 2017, 8, 104.	1.7	28
155	A new approach for plant monitoring using type-2 fuzzy logic and fractal theory. <i>International Journal of General Systems</i> , 2004, 33, 305-319.	1.2	27
156	A cognitive map and fuzzy inference engine model for online design and self fine-tuning of fuzzy logic controllers. <i>International Journal of Intelligent Systems</i> , 2009, 24, 1134-1173.	3.3	27
157	A new optimization meta-heuristic algorithm based on self-defense mechanism of the plants with three reproduction operators. <i>Soft Computing</i> , 2018, 22, 4907-4920.	2.1	27
158	Intelligent control of dynamic systems using type-2 fuzzy logic and stability issues. <i>International Mathematical Forum</i> , 0, , 1371-1382.	0.2	27
159	Type-2 Fuzzy Logic for Improving Training Data and Response Integration in Modular Neural Networks for Image Recognition. <i>Lecture Notes in Computer Science</i> , 2007, , 604-612.	1.0	26
160	Visual-Servoing Based Global Path Planning Using Interval Type-2 Fuzzy Logic Control. <i>Axioms</i> , 2019, 8, 58.	0.9	26
161	Towards asymmetric uncertainty modeling in designing General Type-2 Fuzzy classifiers for medical diagnosis. <i>Expert Systems With Applications</i> , 2021, 183, 115370.	4.4	26
162	Bio-Inspired Algorithms and Its Applications for Optimization in Fuzzy Clustering. <i>Algorithms</i> , 2021, 14, 122.	1.2	25

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163	Design of a Fuzzy System for the Longitudinal Control of an F-14 Airplane. <i>Studies in Computational Intelligence</i> , 2010, , 213-224.	0.7	24
164	Global Path Planning and Path-Following for Wheeled Mobile Robot Using a Novel Control Structure Based on a Vision Sensor. <i>International Journal of Fuzzy Systems</i> , 2020, 22, 1880-1891.	2.3	24
165	Optimization using the firefly algorithm of ensemble neural networks with type-2 fuzzy integration for COVID-19 time series prediction. <i>Soft Computing</i> , 2023, 27, 3245-3282.	2.1	24
166	Automated mathematical modelling for financial time series prediction using fuzzy logic, dynamical systems and fractal theory. , 0, , .		23
167	Simulation and forecasting complex financial time series using neural networks and fuzzy logic. , 0, , .		23
168	Recent Advances in Interval Type-2 Fuzzy Systems. <i>SpringerBriefs in Applied Sciences and Technology</i> , 2012, , .	0.2	23
169	Computational intelligence software for interval type-2 fuzzy logic. <i>Computer Applications in Engineering Education</i> , 2013, 21, 737-747.	2.2	23
170	Parallel Particle Swarm Optimization with Parameters Adaptation Using Fuzzy Logic. <i>Lecture Notes in Computer Science</i> , 2013, , 374-385.	1.0	23
171	Genetic Algorithm Optimization for Type-2 Non-singleton Fuzzy Logic Controllers. <i>Studies in Computational Intelligence</i> , 2014, , 3-18.	0.7	23
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