

William Zhu

List of Publications by Year in descending order

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155
papers

4,905
citations

172457

29
h-index

98798

67
g-index

160
all docs

160
docs citations

160
times ranked

1567
citing authors

#	ARTICLE	IF	CITATIONS
1	Reduction and axiomization of covering generalized rough sets. Information Sciences, 2003, 152, 217-230.	6.9	619
2	Topological approaches to covering rough sets. Information Sciences, 2007, 177, 1499-1508.	6.9	504
3	On Three Types of Covering-Based Rough Sets. IEEE Transactions on Knowledge and Data Engineering, 2007, 19, 1131-1144.	5.7	411
4	Generalized rough sets based on relations. Information Sciences, 2007, 177, 4997-5011.	6.9	367
5	Relationship among basic concepts in covering-based rough sets. Information Sciences, 2009, 179, 2478-2486.	6.9	236
6	Test-cost-sensitive attribute reduction. Information Sciences, 2011, 181, 4928-4942.	6.9	228
7	The algebraic structures of generalized rough set theory. Information Sciences, 2008, 178, 4105-4113.	6.9	209
8	Feature selection with test cost constraint. International Journal of Approximate Reasoning, 2014, 55, 167-179.	3.3	143
9	Subspace learning for unsupervised feature selection via matrix factorization. Pattern Recognition, 2015, 48, 10-19.	8.1	131
10	An efficient hybrid sine-cosine Harris hawks optimization for low and high-dimensional feature selection. Expert Systems With Applications, 2021, 176, 114778.	7.6	116
11	Attribute reduction of data with error ranges and test costs. Information Sciences, 2012, 211, 48-67.	6.9	105
12	Optimal Sink Node Placement in Large Scale Wireless Sensor Networks Based on Harris™ Hawk Optimization Algorithm. IEEE Access, 2020, 8, 19381-19397.	4.2	91
13	The fourth type of covering-based rough sets. Information Sciences, 2012, 201, 80-92.	6.9	89
14	Sparse Graph Embedding Unsupervised Feature Selection. IEEE Transactions on Systems, Man, and Cybernetics: Systems, 2018, 48, 329-341.	9.3	78
15	Multi-label feature selection via feature manifold learning and sparsity regularization. International Journal of Machine Learning and Cybernetics, 2018, 9, 1321-1334.	3.6	78
16	Matroidal approaches to generalized rough sets based on relations. International Journal of Machine Learning and Cybernetics, 2011, 2, 273-279.	3.6	71
17	A New Type of Covering Rough Set. , 2006, , .		70
18	Long-Term Memory Harris™ Hawk Optimization for High Dimensional and Optimal Power Flow Problems. IEEE Access, 2019, 7, 147596-147616.	4.2	61

#	ARTICLE	IF	CITATIONS
19	Unsupervised feature selection via maximum projection and minimum redundancy. Knowledge-Based Systems, 2015, 75, 19-29.	7.1	58
20	Rough matroids based on relations. Information Sciences, 2013, 232, 241-252.	6.9	53
21	Matroidal structure of rough sets and its characterization to attribute reduction. Knowledge-Based Systems, 2012, 36, 155-161.	7.1	46
22	Quantitative analysis for covering-based rough sets through the upper approximation number. Information Sciences, 2013, 220, 483-491.	6.9	45
23	A matroidal approach to rough set theory. Theoretical Computer Science, 2013, 471, 1-11.	0.9	41
24	A new similarity combining reconstruction coefficient with pairwise distance for agglomerative clustering. Information Sciences, 2020, 508, 173-182.	6.9	38
25	Covering Based Granular Computing for Conflict Analysis. Lecture Notes in Computer Science, 2006, , 566-571.	1.3	38
26	Matroidal structure of covering-based rough sets through the upper approximation number. International Journal of Granular Computing, Rough Sets and Intelligent Systems, 2011, 2, 141.	0.3	36
27	Characteristic matrix of covering and its application to Boolean matrix decomposition. Information Sciences, 2014, 263, 186-197.	6.9	35
28	Binary Relation Based Rough Sets. Lecture Notes in Computer Science, 2006, , 276-285.	1.3	33
29	Feature selection for multi-label classification using neighborhood preservation. IEEE/CAA Journal of Automatica Sinica, 2018, 5, 320-330.	13.1	32
30	Optimal cost-sensitive granularization based on rough sets for variable costs. Knowledge-Based Systems, 2014, 65, 72-82.	7.1	30
31	Properties of the Second Type of Covering-Based Rough Sets. , 2006, , .		28
32	A cost sensitive decision tree algorithm with two adaptive mechanisms. Knowledge-Based Systems, 2015, 88, 24-33.	7.1	27
33	Nullity-based matroid of rough sets and its application to attribute reduction. Information Sciences, 2014, 263, 153-165.	6.9	25
34	Local gap density for clustering high-dimensional data with varying densities. Knowledge-Based Systems, 2019, 184, 104905.	7.1	21
35	Hybrid channel based pedestrian detection. Neurocomputing, 2020, 389, 1-8.	5.9	21
36	Combating Fake News in "Low-Resource" Languages: Amharic Fake News Detection Accompanied by Resource Crafting. Information (Switzerland), 2021, 12, 20.	2.9	21

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37	Matroidal Structure of Rough Sets from the Viewpoint of Graph Theory. Journal of Applied Mathematics, 2012, 2012, 1-27.	0.9	19
38	Multi-view fuzzy clustering of deep random walk and sparse low-rank embedding. Information Sciences, 2022, 586, 224-238.	6.9	18
39	Graph and matrix approaches to rough sets through matroids. Information Sciences, 2014, 288, 1-11.	6.9	17
40	Overlapping community identification approach in online social networks. Physica A: Statistical Mechanics and Its Applications, 2015, 421, 233-248.	2.6	17
41	Early Detection of Fake News "Before It Flies High". , 2019, , .		17
42	Properties of the Fourth Type of Covering-Based Rough Sets. , 2006, , .		16
43	Applications of Bipartite Graphs and their Adjacency Matrices to Covering-based Rough Sets. Fundamenta Informaticae, 2017, 156, 237-254.	0.4	16
44	Another approach to rough soft hemirings and corresponding decision making. Soft Computing, 2017, 21, 3769-3780.	3.6	15
45	A genetic algorithm to the minimal test cost reduct problem. , 2011, , .		14
46	Four matroidal structures of covering and their relationships with rough sets. International Journal of Approximate Reasoning, 2013, 54, 1361-1372.	3.3	14
47	An adaptive kernelized rank-order distance for clustering non-spherical data with high noise. International Journal of Machine Learning and Cybernetics, 2020, 11, 1735-1747.	3.6	14
48	Axiomatic Systems of Generalized Rough Sets. Lecture Notes in Computer Science, 2006, , 216-221.	1.3	14
49	Transversal and Function Matroidal Structures of Covering-Based Rough Sets. Lecture Notes in Computer Science, 2011, , 146-155.	1.3	14
50	Cost-Sensitive Feature Selection of Numeric Data with Measurement Errors. Journal of Applied Mathematics, 2013, 2013, 1-13.	0.9	13
51	Comparison of Discretization Approaches for Granular Association Rule Mining. Canadian Journal of Electrical and Computer Engineering, 2014, 37, 157-167.	2.0	13
52	Rough set methods in feature selection via submodular function. Soft Computing, 2017, 21, 3699-3711.	3.6	13
53	Test-cost-sensitive attribute reduction based on neighborhood rough set. , 2011, , .		12
54	Test-Cost-Sensitive Attribute Reduction of Data with Normal Distribution Measurement Errors. Mathematical Problems in Engineering, 2013, 2013, 1-12.	1.1	12

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55	Granular association rules with four subtypes. , 2012, , .		11
56	An improved artificial bee colony algorithm for minimal time cost reduction. International Journal of Machine Learning and Cybernetics, 2014, 5, 743-752.	3.6	11
57	Rough Set Characterization for 2-circuit Matroid. Fundamenta Informaticae, 2014, 129, 377-393.	0.4	10
58	Balise arrangement optimization for train station parking via expert knowledge and genetic algorithm. Applied Mathematical Modelling, 2016, 40, 8513-8529.	4.2	10
59	Optimal Sub-Reducts with Test Cost Constraint. Lecture Notes in Computer Science, 2011, , 57-62.	1.3	10
60	Applications of Matrices to a Matroidal Structure of Rough Sets. Journal of Applied Mathematics, 2013, 2013, 1-9.	0.9	9
61	Covering-Based Rough Sets on Eulerian Matroids. Journal of Applied Mathematics, 2013, 2013, 1-8.	0.9	9
62	Conditions for coverings to induce matroids. International Journal of Machine Learning and Cybernetics, 2014, 5, 947-954.	3.6	9
63	Connectedness of graphs and its application to connected matroids through covering-based rough sets. Soft Computing, 2016, 20, 1841-1851.	3.6	9
64	GDPC: generalized density peaks clustering algorithm based on order similarity. International Journal of Machine Learning and Cybernetics, 2021, 12, 719-731.	3.6	9
65	Fighting Fake News Using Deep Learning. , 2020, , .		9
66	A Backtracking Approach to Minimal Cost Feature Selection of Numerical Data. Journal of Information and Computational Science, 2013, 10, 4105-4115.	0.1	9
67	Clustering experience replay for the effective exploitation in reinforcement learning. Pattern Recognition, 2022, 131, 108875.	8.1	9
68	Granular association rules for multi-valued data. , 2013, , .		8
69	An exponent weighted algorithm for minimal cost feature selection. International Journal of Machine Learning and Cybernetics, 2016, 7, 689-698.	3.6	8
70	Test-cost-sensitive attribute reduction on heterogeneous data for adaptive neighborhood model. Soft Computing, 2016, 20, 4813-4824.	3.6	8
71	Dependence space of topology and its application to attribute reduction. International Journal of Machine Learning and Cybernetics, 2018, 9, 691-698.	3.6	8
72	Ant colony optimization to minimal test cost reduction. , 2012, , .		7

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73	Parametric Rough Sets with Application to Granular Association Rule Mining. <i>Mathematical Problems in Engineering</i> , 2013, 2013, 1-13.	1.1	7
74	Mining top-k granular association rules for recommendation. , 2013, , .		7
75	Fast randomized algorithm with restart strategy for minimal test cost feature selection. <i>International Journal of Machine Learning and Cybernetics</i> , 2015, 6, 435-442.	3.6	7
76	On the matroidal structure of generalized rough set based on relation via definable sets. <i>International Journal of Machine Learning and Cybernetics</i> , 2016, 7, 135-144.	3.6	7
77	Deep random walk of unitary invariance for large-scale data representation. <i>Information Sciences</i> , 2021, 554, 1-14.	6.9	7
78	Matroidal Structure of Rough Sets Based on Serial and Transitive Relations. <i>Journal of Applied Mathematics</i> , 2012, 2012, 1-16.	0.9	6
79	Geometric Lattice Structure of Covering-Based Rough Sets through Matroids. <i>Journal of Applied Mathematics</i> , 2012, 2012, 1-25.	0.9	6
80	A comparative study of discretization approaches for granular association rule mining. , 2013, , .		6
81	Parametric Matroid of Rough Set. <i>International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems</i> , 2015, 23, 893-908.	1.9	6
82	Closed-set lattice and modular matroid induced by covering-based rough sets. <i>International Journal of Machine Learning and Cybernetics</i> , 2017, 8, 191-201.	3.6	6
83	Generative classification model for categorical data based on latent Gaussian process. <i>Pattern Recognition Letters</i> , 2017, 92, 56-61.	4.2	6
84	Adaptive exploration policy for explorationâ€™exploitation tradeoff in continuous action control optimization. <i>International Journal of Machine Learning and Cybernetics</i> , 2021, 12, 3491-3501.	3.6	6
85	Anchor: The achieved goal to replace the subgoal for hierarchical reinforcement learning. <i>Knowledge-Based Systems</i> , 2021, 225, 107128.	7.1	6
86	A Competition Strategy to Cost-Sensitive Decision Trees. <i>Lecture Notes in Computer Science</i> , 2012, , 359-368.	1.3	6
87	Optimal sub-reducts in the dynamic environment. , 2011, , .		5
88	Rough matroid. , 2011, , .		5
89	Ant Colony Optimization with Three Stages for Independent Test Cost Attribute Reduction. <i>Mathematical Problems in Engineering</i> , 2013, 2013, 1-11.	1.1	5
90	Closed-set lattice of regular sets based on a serial and transitive relation through matroids. <i>International Journal of Machine Learning and Cybernetics</i> , 2014, 5, 395-401.	3.6	5

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91	Matrix approaches to rough sets through vector matroids over fields. International Journal of Granular Computing, Rough Sets and Intelligent Systems, 2014, 3, 179.	0.3	5
92	A CNN-based policy for optimizing continuous action control by learning state sequences. Neurocomputing, 2022, 468, 286-295.	5.9	5
93	Equivalent Characterizations of Some Graph Problems by Covering-Based Rough Sets. Journal of Applied Mathematics, 2013, 2013, 1-7.	0.9	4
94	Feature Fusing of Feature Pyramid Network for Multi-Scale Pedestrian Detection. , 2018, , .		4
95	Architecture self-attention mechanism: nonlinear optimization for neural architecture search. Journal of Nonlinear and Variational Analysis, 2021, 5, 119-140.	0.6	4
96	Multigraph Random Walk for Joint Learning of Multiview Clustering and Semisupervised Classification. IEEE Transactions on Computational Social Systems, 2022, 9, 926-939.	4.4	4
97	Minimal Test Cost Feature Selection with Positive Region Constraint. Lecture Notes in Computer Science, 2012, , 259-266.	1.3	4
98	Granular Association Rule Mining through Parametric Rough Sets. Lecture Notes in Computer Science, 2012, , 320-331.	1.3	4
99	Topological Characterizations for Three Covering Approximation Operators. Lecture Notes in Computer Science, 2013, , 277-284.	1.3	4
100	The vectorially matroidal structure of generalized rough sets based on relations. , 2011, , .		3
101	Characteristic of partition-circuit matroid through approximation number. , 2012, , .		3
102	Multi-objective cost-sensitive attribute reduction. , 2013, , .		3
103	Secondary basis unique augmentation matroids and union minimal matroids. International Journal of Machine Learning and Cybernetics, 2014, 5, 955-962.	3.6	3
104	Cost-sensitive decision tree with probabilistic pruning mechanism. , 2015, , .		3
105	Saliency: a new selection criterion of important architectures in neural architecture search. Neural Computing and Applications, 2022, 34, 1269-1283.	5.6	3
106	Enhanced Bat Algorithm for Solving Non-Convex Economic Dispatch Problem. Advances in Intelligent Systems and Computing, 2020, , 419-428.	0.6	3
107	Top-N Recommendation Based on Granular Association Rules. Lecture Notes in Computer Science, 2014, , 194-205.	1.3	3
108	Attribute Reduction in Time-cost-sensitive Decision Systems through Backtracking. Journal of Information and Computational Science, 2014, 11, 597-606.	0.1	3

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109	A Web Text Filter Based on Rough Set Weighted Bayesian. , 2009, , .		2
110	An improved genetic algorithm to minimal test cost reduction. , 2012, , .		2
111	Matroidal structure of generalized rough sets based on symmetric and transitive relations. , 2013, , .		2
112	A Variable Precision Covering-Based Rough Set Model Based on Functions. Scientific World Journal, The, 2014, 2014, 1-5.	2.1	2
113	On three types of covering-based rough sets via definable sets. , 2014, , .		2
114	Applications of repeat degree to coverings of neighborhoods. International Journal of Machine Learning and Cybernetics, 2016, 7, 931-941.	3.6	2
115	Characteristic matrices of compound operations of coverings and their relationships with rough sets. International Journal of Machine Learning and Cybernetics, 2019, 10, 75-85.	3.6	2
116	Bipartite Graphs and Coverings. Lecture Notes in Computer Science, 2011, , 722-727.	1.3	2
117	Mining Significant Granular Association Rules for Diverse Recommendation. Lecture Notes in Computer Science, 2014, , 120-127.	1.3	2
118	MDMD options discovery for accelerating exploration in sparse-reward domains. Knowledge-Based Systems, 2022, 241, 108151.	7.1	2
119	Deep graph clustering with enhanced feature representations for community detection. Applied Intelligence, 2023, 53, 1336-1349.	5.3	2
120	Reducible matroid and reducible element of covering-based rough sets. , 2011, , .		1
121	Characteristics of 2-circuit matroids through rough sets. , 2012, , .		1
122	Covering Cycle Matroid. ISRN Applied Mathematics, 2013, 2013, 1-12.	0.5	1
123	Matroidal Structure of Generalized Rough Sets Based on Tolerance Relations. Scientific World Journal, The, 2014, 2014, 1-7.	2.1	1
124	An approach to covering-based rough sets through bipartite graphs. , 2014, , .		1
125	Geometric Lattice Structure of Covering and Its Application to Attribute Reduction through Matroids. Journal of Applied Mathematics, 2014, 2014, 1-8.	0.9	1
126	Optimal feature subset with positive region constraints. , 2015, , .		1

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127	Unsupervised feature selection with the largest angle coding. International Journal of Computer Mathematics: Computer Systems Theory, 2017, 2, 66-80.	1.1	1
128	Human Segmentation with Deep Contour-Aware Network. , 2018, , .		1
129	A New Hierarchical Reinforcement Learning Framework for Relation Extraction. , 2021, , .		1
130	A Survey of Social Image Colocalization. IEEE Transactions on Computational Social Systems, 2021, 8, 906-916.	4.4	1
131	Feature Selection with Positive Region Constraint for Test-Cost-Sensitive Data. Lecture Notes in Computer Science, 2014, , 23-33.	1.3	1
132	Layered feature representation for differentiable architecture search. Soft Computing, 2022, 26, 4741-4753.	3.6	1
133	ACP based reinforcement learning for long-term recommender system. International Journal of Machine Learning and Cybernetics, 2022, 13, 3285-3297.	3.6	1
134	Characterization of attribute reduction of decision system through matroid theory. , 2012, , .		0
135	FAST RANDOMIZED ALGORITHM FOR MINIMAL TEST COST ATTRIBUTE REDUCTION. International Journal of Reliability, Quality and Safety Engineering, 2014, 21, 1450028.	0.6	0
136	Condition for neighbourhoods induced by a covering to be equal to the covering itself. International Journal of Granular Computing, Rough Sets and Intelligent Systems, 2014, 3, 195.	0.3	0
137	Covering-based rough sets on covering-circuit matroids. , 2014, , .		0
138	A matroidal structure for formal context and its applications on epidemiological study. , 2015, , .		0
139	Connectedness of Graph and Matroid by Covering-Based Rough Sets. Lecture Notes in Computer Science, 2015, , 149-160.	1.3	0
140	Long-term Recommender System based on ACP Framework. , 2021, , .		0
141	WDIBS: Wasserstein deterministic information bottleneck for state abstraction to balance state-compression and performance. Applied Intelligence, 0, , 1.	5.3	0
142	Convergence Classes of L -Filters in L , M -Fuzzy Topological Spaces. Journal of Mathematics, 2021, 2021, 1-10.	1.0	0
143	Test Cost Constraint Reduction with Common Cost. Lecture Notes in Computer Science, 2011, , 55-63.	1.3	0
144	Comparative Study between Extension of Covering Approximation Space and Its Induction through Transversal Matroid. Lecture Notes in Computer Science, 2013, , 225-235.	1.3	0

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145	A New Type of Covering-Based Rough Sets. Lecture Notes in Computer Science, 2014, , 489-499.	1.3	0
146	Feature Selection with Positive Region Constraint for Test-Cost-Sensitive Data. Lecture Notes in Computer Science, 2014, , 23-33.	1.3	0
147	Feature Selection with Time Cost Constraint. Journal of Information and Computational Science, 2014, 11, 201-210.	0.1	0
148	A Logarithmic Weighted Algorithm for Minimal Test Cost Attribute Reduction. Lecture Notes in Computer Science, 2014, , 129-138.	1.3	0
149	Covering Approximations in Set-Valued Information Systems. Lecture Notes in Computer Science, 2014, , 663-672.	1.3	0
150	Global Best Artificial Bee Colony for Minimal Test Cost Attribute Reduction. Lecture Notes in Computer Science, 2014, , 101-110.	1.3	0
151	A Comparison of Two Types of Covering-Based Rough Sets Through the Complement of Coverings. Lecture Notes in Computer Science, 2015, , 90-101.	1.3	0
152	The Connectivity of the Covering Approximation Space. Lecture Notes in Computer Science, 2015, , 435-445.	1.3	0
153	Sparse Matrix Feature Selection in Multi-label Learning. Lecture Notes in Computer Science, 2015, , 332-339.	1.3	0
154	The Matroidal Structures of the Second Type of Covering-Based Rough Set. Lecture Notes in Computer Science, 2015, , 231-242.	1.3	0
155	Multiview Deep Matrix Factorization for Shared Compact Representation. IEEE Transactions on Computational Social Systems, 2023, 10, 2739-2751.	4.4	0