Jianhua Joshua Yang

List of Publications by Year
in descending order

175 papers	31,814 citations	9775 73 h-index	7736 150 g-index
178 all docs	178 docs citations	178 times ranked	13710 citing authors

#	Article	IF	Citations
1	Memristive devices for computing. Nature Nanotechnology, 2013, 8, 13-24.	15.6	3,019
2	Memristive switching mechanism for metal/oxide/metal nanodevices. Nature Nanotechnology, 2008, 3, 429-433.	15.6	2,578
3	â€˜Memristiveâ€™ switches enable â€˜statefulâ€™ logic operations via material implication. Nature, 2010, 464, 873-876.	13.7	1,828
4	Memristors with diffusive dynamics as synaptic emulators for neuromorphic computing. Nature Materials, 2017, 16, 101-108.	13.3	1,655
5	Fully hardware-implemented memristor convolutional neural network. Nature, 2020, 577, 641-646.	13.7	1,198
6	Memristive crossbar arrays for brain-inspired computing. Nature Materials, 2019, 18, 309-323.	13.3	1,058
7	Analogue signal and image processing with large memristor crossbars. Nature Electronics, 2018, 1, 52-59.	13.1	879
8	Fully memristive neural networks for pattern classification with unsupervised learning. Nature Electronics, 2018, 1, 137-145.	13.1	787
9	The mechanism of electroforming of metal oxide memristive switches. Nanotechnology, 2009, 20, 215201.	1.3	699
10	Resistive switching materials forÂinformation processing. Nature Reviews Materials, 2020, 5, 173-195.	23.3	668
11	Memristorâ^'CMOS Hybrid Integrated Circuits for Reconfigurable Logic. Nano Letters, 2009, 9, 3640-3645.	4.5	628
12	Switching dynamics in titanium dioxide memristive devices. Journal of Applied Physics, 2009, 106, .	1.1	609
13	Efficient and self-adaptive in-situ learning in multilayer memristor neural networks. Nature Communications, 2018, 9, 2385.	5.8	575
14	High switching endurance in TaOx memristive devices. Applied Physics Letters, 2010, 97, .	1.5	543
15	Robust memristors based on layered two-dimensional materials. Nature Electronics, 2018, 1, 130-136.	13.1	539
16	Memristorâ€Based Analog Computation and Neural Network Classification with a Dot Product Engine. Advanced Materials, 2018, 30, 1705914.	11.1	517
17	Parallel programming of an ionic floating-gate memory array for scalable neuromorphic computing. Science, 2019, 364, 570-574.	6.0	484
18	Dot-product engine for neuromorphic computing. , 2016, , .		481

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19	Recommended Methods to Study Resistive Switching Devices. Advanced Electronic Materials, 2019, 5, 1800143.	2.6	452
20	Bridging Biological and Artificial Neural Networks with Emerging Neuromorphic Devices: Fundamentals, Progress, and Challenges. Advanced Materials, 2019, 31, e1902761.	11.1	418
21	Anatomy of a Nanoscale Conduction Channel Reveals the Mechanism of a Highâ€Performance Memristor. Advanced Materials, 2011, 23, 5633-5640.	11.1	393
22	Memristor crossbar arrays with 6-nm half-pitch and 2-nm critical dimension. Nature Nanotechnology, 2019, 14, 35-39.	15.6	381
23	Review of memristor devices in neuromorphic computing: materials sciences and device challenges. Journal Physics D: Applied Physics, 2018, 51, 503002.	1.3	326
24	Direct Identification of the Conducting Channels in a Functioning Memristive Device. Advanced Materials, 2010, 22, 3573-3577.	11.1	307
25	Emerging Memory Devices for Neuromorphic Computing. Advanced Materials Technologies, 2019, 4, 1800589.	3.0	307
26	An artificial nociceptor based on a diffusive memristor. Nature Communications, 2018, 9, 417.	5.8	295
27	Anatomy of Ag/Hafniaâ€Based Selectors with 10¹⁰ Nonlinearity. Advanced Materials, 2017, 29, 1604457.	11.1	292
28	Long short-term memory networks in memristor crossbar arrays. Nature Machine Intelligence, 2019, 1, 49-57.	8.3	288
29	A novel true random number generator based on a stochastic diffusive memristor. Nature Communications, 2017, 8, 882.	5.8	287
30	Understanding memristive switching via in situ characterization and device modeling. Nature Communications, 2019, 10, 3453.	5.8	275
31	Highâ€Speed and Lowâ€Energy Nitride Memristors. Advanced Functional Materials, 2016, 26, 5290-5296.	7.8	264
32	Reinforcement learning with analogue memristor arrays. Nature Electronics, 2019, 2, 115-124.	13.1	247
33	Flexible three-dimensional artificial synapse networks with correlated learning and trainable memory capability. Nature Communications, 2017, 8, 752.	5.8	245
34	Three-dimensional memristor circuits as complex neural networks. Nature Electronics, 2020, 3, 225-232.	13.1	242
35	Threshold Switching of Ag or Cu in Dielectrics: Materials, Mechanism, and Applications. Advanced Functional Materials, 2018, 28, 1704862.	7.8	239
36	An artificial spiking afferent nerve based on Mott memristors for neurorobotics. Nature Communications, 2020, 11, 51.	5.8	217

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37	Brain-inspired computing with memristors: Challenges in devices, circuits, and systems. Applied Physics Reviews, 2020, 7, .	5.5	217
38	2022 roadmap on neuromorphic computing and engineering. Neuromorphic Computing and Engineering, 2022, 2, 022501.	2.8	217
39	A Family of Electronically Reconfigurable Nanodevices. Advanced Materials, 2009, 21, 3754-3758.	11.1	213
40	Gate-tunable van der Waals heterostructure for reconfigurable neural network vision sensor. Science Advances, 2020, 6, eaba6173.	4.7	202
41	In situ training of feed-forward and recurrent convolutional memristor networks. Nature Machine Intelligence, 2019, 1, 434-442.	8.3	201
42	Capacitive neural network with neuro-transistors. Nature Communications, 2018, 9, 3208.	5.8	199
43	Power-efficient combinatorial optimization using intrinsic noise in memristor Hopfield neural networks. Nature Electronics, 2020, 3, 409-418.	13.1	196
44	State Dynamics and Modeling of Tantalum Oxide Memristors. IEEE Transactions on Electron Devices, 2013, 60, 2194-2202.	1.6	183
45	Engineering nonlinearity into memristors for passive crossbar applications. Applied Physics Letters, 2012, 100, .	1.5	179
46	Sub-10 nm Ta Channel Responsible for Superior Performance of a HfO2 Memristor. Scientific Reports, 2016, 6, 28525.	1.6	177
47	Electrical Performance and Scalability of Pt Dispersed SiO₂ Nanometallic Resistance Switch. Nano Letters, 2013, 13, 3213-3217.	4.5	175
48	Low-Power, Self-Rectifying, and Forming-Free Memristor with an Asymmetric Programing Voltage for a High-Density Crossbar Application. Nano Letters, 2016, 16, 6724-6732.	4.5	171
49	Emerging non-volatile memories. , 2011, , .		165
50	CMOS-integrated memristive non-volatile computing-in-memory for AI edge processors. Nature Electronics, 2019, 2, 420-428.	13.1	161
51	Silicon Oxide (SiO<i>_x</i>): A Promising Material for Resistance Switching?. Advanced Materials, 2018, 30, e1801187.	11.1	156
52	Three-dimensional crossbar arrays of self-rectifying Si/SiO2/Si memristors. Nature Communications, 2017, 8, 15666.	5.8	153
53	Reservoir Computing Using Diffusive Memristors. Advanced Intelligent Systems, 2019, 1, 1900084.	3.3	147
54	Bioinspired bio-voltage memristors. Nature Communications, 2020, 11, 1861.	5.8	144

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55	Power-efficient neural network with artificial dendrites. Nature Nanotechnology, 2020, 15, 776-782.	15.6	141
56	Metal/TiO2 interfaces for memristive switches. Applied Physics A: Materials Science and Processing, 2011, 102, 785-789.	1.1	138
57	Standards for the Characterization of Endurance in Resistive Switching Devices. ACS Nano, 2021, 15, 17214-17231.	7.3	128
58	Continuous Electrical Tuning of the Chemical Composition of TaO_{<i>x</i>}-Based Memristors. ACS Nano, 2012, 6, 2312-2318.	7.3	119
59	Mimicking Classical Conditioning Based on a Single Flexible Memristor. Advanced Materials, 2017, 29, 1602890.	11.1	119
60	Metal oxide memories based on thermochemical and valence change mechanisms. MRS Bulletin, 2012, 37, 131-137.	1.7	114
61	Diffusion of Adhesion Layer Metals Controls Nanoscale Memristive Switching. Advanced Materials, 2010, 22, 4034-4038.	11.1	104
62	Roadmap on emerging hardware and technology for machine learning. Nanotechnology, 2021, 32, 012002.	1.3	104
63	Coexistence of Memristance and Negative Differential Resistance in a Nanoscale Metalâ€Oxideâ€Metal System. Advanced Materials, 2011, 23, 1730-1733.	11.1	103
64	The switching location of a bipolar memristor: chemical, thermal and structural mapping. Nanotechnology, 2011, 22, 254015.	1.3	101
65	Self-Aligned Memristor Cross-Point Arrays Fabricated with One Nanoimprint Lithography Step. Nano Letters, 2010, 10, 2909-2914.	4.5	98
66	Trilayer Tunnel Selectors for Memristor Memory Cells. Advanced Materials, 2016, 28, 356-362.	11.1	96
67	Quantized conductance coincides with state instability and excess noise in tantalum oxide memristors. Nature Communications, 2016, 7, 11142.	5.8	95
68	Voltage divider effect for the improvement of variability and endurance of TaOx memristor. Scientific Reports, 2016, 6, 20085.	1.6	93
69	Artificial Neural Network (ANN) to Spiking Neural Network (SNN) Converters Based on Diffusive Memristors. Advanced Electronic Materials, 2019, 5, 1900060.	2.6	92
70	Electrical transport and thermometry of electroformed titanium dioxide memristive switches. Journal of Applied Physics, 2009, 106, .	1.1	87
71	Spectromicroscopy of tantalum oxide memristors. Applied Physics Letters, 2011, 98, .	1.5	85
72	A Compact Memristor-Based Dynamic Synapse for Spiking Neural Networks. IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 2017, 36, 1353-1366.	1.9	81

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73	Low-Voltage, CMOS-Free Synaptic Memory Based on Li<i>_X</i>TiO₂ Redox Transistors. ACS Applied Materials & Interfaces, 2019, 11, 38982-38992.	4.0	78
74	Synaptic electronics and neuromorphic computing. Science China Information Sciences, 2016, 59, 1.	2.7	76
75	Feedback write scheme for memristive switching devices. Applied Physics A: Materials Science and Processing, 2011, 102, 973-982.	1.1	75
76	Truly Electroformingâ€Free and Lowâ€Energy Memristors with Preconditioned Conductive Tunneling Paths. Advanced Functional Materials, 2017, 27, 1702010.	7.8	75
77	Twoâ€•and Threeâ€Terminal Resistive Switches: Nanometerâ€Scale Memristors and Memistors. Advanced Functional Materials, 2011, 21, 2660-2665.	7.8	74
78	Observation of two resistance switching modes in TiO₂memristive devices electroformed at low current. Nanotechnology, 2011, 22, 254007.	1.3	71
79	Morphological and electrical changes in TiO₂ memristive devices induced by electroforming and switching. Physica Status Solidi - Rapid Research Letters, 2010, 4, 16-18.	1.2	67
80	Radiation Hardness of ${m TiO}_{2}$ Memristive Junctions. IEEE Transactions on Nuclear Science, 2010, 57, 1640-1643.	1.2	67
81	A physical model of switching dynamics in tantalum oxide memristive devices. Applied Physics Letters, 2013, 102, 223502.	1.5	66
82	Dopant Control by Atomic Layer Deposition in Oxide Films for Memristive Switches. Chemistry of Materials, 2011, 23, 123-125.	3.2	65
83	Nitride memristors. Applied Physics A: Materials Science and Processing, 2012, 109, 1-4.	1.1	63
84	A provable key destruction scheme based on memristive crossbar arrays. Nature Electronics, 2018, 1, 548-554.	13.1	61
85	Characterization of electroforming-free titanium dioxide memristors. Beilstein Journal of Nanotechnology, 2013, 4, 467-473.	1.5	60
86	A Lowâ€Current and Analog Memristor with Ru as Mobile Species. Advanced Materials, 2020, 32, e1904599.	11.1	59
87	Structural and chemical characterization of TiO2memristive devices by spatially-resolved NEXAFS. Nanotechnology, 2009, 20, 485701.	1.3	58
88	Electronic structure and transport measurements of amorphous transition-metal oxides: observation of Fermi glass behavior. Applied Physics A: Materials Science and Processing, 2012, 107, 1-11.	1.1	58
89	Hybrid CMOS/memristor circuits. , 2010, , .		57
90	Memristive devices in computing system. ACM Journal on Emerging Technologies in Computing Systems, 2013, 9, 1-20.	1.8	57

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91	Mott-transition-based RRAM. Materials Today, 2019, 28, 63-80.	8.3	56
92	Nanoscale diffusive memristor crossbars as physical unclonable functions. Nanoscale, 2018, 10, 2721-2726.	2.8	52
93	A Memristor with Low Switching Current and Voltage for 1S1R Integration and Array Operation. Advanced Electronic Materials, 2020, 6, 1901411.	2.6	51
94	Enabling selectivity and fast recovery of ZnO nanowire gas sensors through resistive switching. Sensors and Actuators B: Chemical, 2017, 238, 357-363.	4.0	50
95	Integration and Co-design of Memristive Devices and Algorithms for Artificial Intelligence. IScience, 2020, 23, 101809.	1.9	49
96	Nonlinearity in Memristors for Neuromorphic Dynamic Systems. Small Science, 2022, 2, 2100049.	5.8	46
97	A compact modeling of TiO2-TiO2â€“<i>x</i> memristor. Applied Physics Letters, 2013, 102, .	1.5	40
98	Force modulation of tunnel gaps in metal oxide memristive nanoswitches. Applied Physics Letters, 2009, 95, 113503.	1.5	38
99	A fully hardware-based memristive multilayer neural network. Science Advances, 2021, 7, eabj4801.	4.7	37
100	Electrochemical metallization switching with a platinum group metal in different oxides. Nanoscale, 2016, 8, 14023-14030.	2.8	35
101	Battery-like artificial synapses. Nature Materials, 2017, 16, 396-397.	13.3	35
102	Characteristics and transport mechanisms of triple switching regimes of TaOx memristor. Applied Physics Letters, 2017, 110, .	1.5	35
103	Oxide and Carbide Formation at Titanium/Organic Monolayer Interfaces. Journal of the American Chemical Society, 2008, 130, 4041-4047.	6.6	34
104	Low Variability Resistorâ€“Memristor Circuit Masking the Actual Memristor States. Advanced Electronic Materials, 2015, 1, 1500095.	2.6	34
105	An investigation of phase transformation behavior in sputter-deposited PtMn thin films. Jom, 2006, 58, 50-54.	0.9	33
106	Electrode-material dependent switching in TaO_{<i>x</i>}memristors. Semiconductor Science and Technology, 2014, 29, 104003.	1.0	27
107	An efficient analog Hamming distance comparator realized with a unipolar memristor array: a showcase of physical computing. Scientific Reports, 2017, 7, 40135.	1.6	27
108	Impact of geometry on the performance of memristive nanodevices. Nanotechnology, 2011, 22, 254026.	1.3	26

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109	In-Memory Computing with Memristor Arrays. , 2018, , .		26
110	A niobium oxide-tantalum oxide selector-memristor self-aligned nanostack. Applied Physics Letters, 2017, 110, .	1.5	25
111	Memristor structures for high scalability: Non-linear and symmetric devices utilizing fabrication friendly materials and processes. Microelectronic Engineering, 2013, 103, 66-69.	1.1	23
112	Low voltage two-state-variable memristor model of vacancy-drift resistive switches. Applied Physics A: Materials Science and Processing, 2015, 119, 1-9.	1.1	22
113	Over 70% tunneling magnetoresistance at room temperature for a CoFe and AlOx based magnetic tunnel junction. Applied Physics Letters, 2006, 89, 202502.	1.5	21
114	Inducing tunable switching behavior in a single memristor. Applied Materials Today, 2018, 11, 280-290.	2.3	21
115	Thermally induced crystallization in NbO2 thin films. Scientific Reports, 2016, 6, 34294.	1.6	20
116	A Dynamical Compact Model of Diffusive and Drift Memristors for Neuromorphic Computing. Advanced Electronic Materials, 2022, 8, 2100696.	2.6	19
117	Artificial neural networks based on memristive devices. Science China Information Sciences, 2018, 61, 1.	2.7	18
118	Timing Selector: Using Transient Switching Dynamics to Solve the Sneak Path Issue of Crossbar Arrays. Small Science, 2022, 2, 2100072.	5.8	18
119	The formation of amorphous alloy oxides as barriers used in magnetic tunnel junctions. Journal of Applied Physics, 2005, 98, 074508.	1.1	17
120	An energy-efficient and high-throughput bitwise CNN on sneak-path-free digital ReRAM crossbar. , 2017, , .		17
121	Pulse-Width Modulation based Dot-Product Engine for Neuromorphic Computing System using Memristor Crossbar Array. , 2018, , .		17
122	Experimental Demonstration of Conversion-Based SNNs with 1T1R Mott Neurons for Neuromorphic Inference. , 2019, , .		17
123	A Survey on Architecture Advances Enabled by Emerging Beyond-CMOS Technologies. IEEE Design and Test, 2019, 36, 46-68.	1.1	16
124	Large Memristor Crossbars for Analog Computing. , 2018, , .		14
125	A neuromorphic ASIC design using one-selector-one-memristor crossbar. , 2016, , .		13
126	A selector device based on grapheneâ€“oxide heterostructures for memristor crossbar applications. Applied Physics A: Materials Science and Processing, 2015, 120, 403-407.	1.1	11

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127	Oxidation of tunnel barrier metals in magnetic tunnel junctions. Journal of Applied Physics, 2005, 97, 10C918.	1.1	10
128	Growth and physical property of epitaxial Co70Fe30 thin film on Si substrate via TiN buffer. Applied Physics Letters, 2008, 92, 022504.	1.5	10
129	Band offsets in transition-metal oxide heterostructures. Journal Physics D: Applied Physics, 2013, 46, 295303.	1.3	10
130	Cyclical sensing integrate-and-fire circuit for memristor array based neuromorphic computing. , 2016, , .		10
131	Threshold Switching: Threshold Switching of Ag or Cu in Dielectrics: Materials, Mechanism, and Applications (Adv. Funct. Mater. 6/2018). Advanced Functional Materials, 2018, 28, 1870036.	7.8	10
132	Engineering Tunneling Selector to Achieve High Non-linearity for 1S1R Integration. Frontiers in Nanotechnology, 2021, 3, .	2.4	10
133	Efficient AI with MRAM. Nature Electronics, 2022, 5, 67-68.	13.1	9
134	Origin of the dependence of magnetoresistance on the composition of Co100â^'xFex electrodes in magnetic tunnel junctions. Journal of Applied Physics, 2008, 103, 056102.	1.1	8
135	On the integration of memristors with CMOS using nanoimprint lithography. Proceedings of SPIE, 2009, , .	0.8	8
136	Reset switching statistics of TaOx-based Memristor. Journal of Electroceramics, 2017, 39, 132-136.	0.8	8
137	Compositional effect of bcc Co100â^'x Fe x electrodes onÂmagnetoresistance in AlO x -based magnetic tunnel junctions. Applied Physics A: Materials Science and Processing, 2010, 98, 707-710.	1.1	7
138	Progress in CMOS-memristor integration. , 2011, , .		7
139	Crystal structure effect of ferromagnetic electrode on tunneling magnetoresistance. Acta Materialia, 2008, 56, 1491-1495.	3.8	6
140	Origin of inverse tunneling magnetoresistance in a symmetric junction revealed by delaminating the buried electronic interface. Applied Physics Letters, 2009, 95, 233117.	1.5	6
141	Memristive Devices for Computing: Mechanisms, Applications and Challenges. ECS Transactions, 2013, 58, 9-14.	0.3	6
142	Learning with Resistive Switching Neural Networks. , 2019, , .		6
143	Corrigendum on 'The mechanism of electroforming of metal oxide memristive switches'. Nanotechnology, 2010, 21, 339803-339803.	1.3	5
144	Memristor-CMOS Analog Coprocessor for Acceleration of High-Performance Computing Applications. ACM Journal on Emerging Technologies in Computing Systems, 2018, 14, 1-30.	1.8	5

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145	Epitaxial Growth and Surface Roughness Control of Ferromagnetic Thin Films on Si by Sputter Deposition. Journal of Electronic Materials, 2008, 37, 355-360.	1.0	4
146	A replacement of high-<i>k</i> process for CMOS transistor by atomic layer deposition. Semiconductor Science and Technology, 2013, 28, 082003.	1.0	4
147	Data related to the nanoscale structural and compositional evolution in resistance change memories. Data in Brief, 2018, 21, 18-24.	0.5	4
148	Unconventional computing with diffusive memristors. , 2018, , .		4
149	RRAM/memristor for computing. , 2019, , 539-583.		4
150	Selective oxidation of an individual layer in a magnetic tunnel junction through the use of thermodynamic control. Applied Physics Letters, 2005, 87, 061901.	1.5	3
151	Thermal expansion coefficients of rare earth metal disilicides and their influence on the growth of disilicide nanowires. Applied Physics A: Materials Science and Processing, 2006, 82, 39-42.	1.1	3
152	New materials for memristive switching. , 2014, , .		3
153	The secret order of disorder. Nature Materials, 2021, , .	13.3	3
154	Thickness determination of ultrathin oxide films and its application in magnetic tunnel junctions. Journal of Electronic Materials, 2006, 35, 2142-2146.	1.0	2
155	Effect of tetragonal lattice distortion of Co70Fe30 on the tunneling magnetoresistance of AlO x based magnetic tunnel junction. Applied Physics A: Materials Science and Processing, 2009, 97, 73-77.	1.1	2
156	Inverse TMR in a nominally symmetric CoFe/AlOx/CoFe junction induced by interfacial Fe3O4 investigated by STEM-EELS. Journal of Magnetism and Magnetic Materials, 2012, 324, 1837-1844.	1.0	2
157	A compact model for selectors based on metal doped electrolyte. Applied Physics A: Materials Science and Processing, 2018, 124, 1.	1.1	2
158	Scalable 3D Ta:SiO x Memristive Devices. Advanced Electronic Materials, 2019, 5, 1800958.	2.6	2
159	Non-volatile memory based on nanostructures. Nanotechnology, 2011, 22, 250201-250201.	1.3	1
160	Oxide based memristive devices. , 2012, , .		1
161	Designing memristors: Physics, materials science and engineering. , 2012, , .		1
162	Structural and Chemical Analysis of Nanoscale Resistive Switching Devices: Assessment on Nonlinear Properties. Materials Research Society Symposia Proceedings, 2015, 1805, 1.	0.1	1

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163	Built-in selectors self-assembled into memristors. , 2016, , .		1
164	Correction: Electrochemical metallization switching with a platinum group metal in different oxides. Nanoscale, 2016, 8, 11766-11766.	2.8	1
165	In-situ TEM Characterization of Ultra-robust Memristors Based on Fully Layered Two-dimensional Materials. Microscopy and Microanalysis, 2018, 24, 1886-1887.	0.2	1
166	Oxide Based Memristive Nanodevices. , 2014, , 219-256.		1
167	Ta/HfO2-based Memristor and Crossbar Arrays for In-Memory Computing. , 2022, , 167-188.		1
168	A heterogeneous computing system with memristor-based neuromorphic accelerators. , 2014, , .		0
169	TEM and EELS Study on TaOx-based Nanoscale Resistive Switching Devices. Materials Research Society Symposia Proceedings, 2015, 1805, 1.	0.1	0
170	Memristor-CMOS Analog Co-Processor for Acceleration of High Performance Computing Applications. , 2018, , .		0
171	Neuronal realizations based on memristive devices. , 2020, , 407-426.		0
172	All Hardware-Based Two-Layer Perceptron Implemented in Memristor Crossbar Arrays. , 2021, , .		0
173	Reset Switching Statistics of TaOx-Based Memristor. Kluwer International Series in Electronic Materials: Science and Technology, 2022, , 187-195.	0.3	0
174	Memristive devices and arrays for neuromorphic computing. , 2020, , .		0
175	Timing Selector: using transient switching dynamics to solve the sneak path issue of crossbar arrays. , 2022, , .		0