John Paul Strachan

List of Publications by Year
in descending order

97 papers	15,653 citations	41323 49 h-index	85498 71 g-index
98 all docs	98 docs citations	98 times ranked	8760 citing authors

#	Article	IF	Citations
1	Memristors with diffusive dynamics as synaptic emulators for neuromorphic computing. Nature Materials, 2017, 16, 101-108.	13.3	1,655
2	The future of electronics based on memristive systems. Nature Electronics, 2018, 1, 22-29.	13.1	1,369
3	ISAAC. Computer Architecture News, 2016, 44, 14-26.	2.5	1,031
4	Analogue signal and image processing with large memristor crossbars. Nature Electronics, 2018, 1, 52-59.	13.1	879
5	Fully memristive neural networks for pattern classification with unsupervised learning. Nature Electronics, 2018, 1, 137-145.	13.1	787
6	Sub-nanosecond switching of a tantalum oxide memristor. Nanotechnology, 2011, 22, 485203.	1.3	596
7	Efficient and self-adaptive in-situ learning in multilayer memristor neural networks. Nature Communications, 2018, 9, 2385.	5.8	575
8	High switching endurance in TaOx memristive devices. Applied Physics Letters, 2010, 97, .	1.5	543
9	Memristorâ€Based Analog Computation and Neural Network Classification with a Dot Product Engine. Advanced Materials, 2018, 30, 1705914.	11.1	517
10	Dot-product engine for neuromorphic computing. , 2016, , .		481
11	Chaotic dynamics in nanoscale NbO2 Mott memristors for analogue computing. Nature, 2017, 548, 318-321.	13.7	427
12	Anatomy of a Nanoscale Conduction Channel Reveals the Mechanism of a Highâ€Performance Memristor. Advanced Materials, 2011, 23, 5633-5640.	11.1	393
13	Direct Identification of the Conducting Channels in a Functioning Memristive Device. Advanced Materials, 2010, 22, 3573-3577.	11.1	307
14	Long short-term memory networks in memristor crossbar arrays. Nature Machine Intelligence, 2019, 1, 49-57.	8.3	288
15	ISAAC: A Convolutional Neural Network Accelerator with In-Situ Analog Arithmetic in Crossbars. , 2016, , .		268
16	Highâ€Speed and Lowâ€Energy Nitride Memristors. Advanced Functional Materials, 2016, 26, 5290-5296.	7.8	264
17	Reinforcement learning with analogue memristor arrays. Nature Electronics, 2019, 2, 115-124.	13.1	247
18	PUMA. , 2019, , .		242

#	ARTICLE	IF	CITATIONS
19	2022 roadmap on neuromorphic computing and engineering. Neuromorphic Computing and Engineering, 2022, 2, 022501.	2.8	217
20	In situ training of feed-forward and recurrent convolutional memristor networks. Nature Machine Intelligence, 2019, 1, 434-442.	8.3	201
21	Capacitive neural network with neuro-transistors. Nature Communications, 2018, 9, 3208.	5.8	199
22	Power-efficient combinatorial optimization using intrinsic noise in memristor Hopfield neural networks. Nature Electronics, 2020, 3, 409-418.	13.1	196
23	State Dynamics and Modeling of Tantalum Oxide Memristors. IEEE Transactions on Electron Devices, 2013, 60, 2194-2202.	1.6	183
24	Engineering nonlinearity into memristors for passive crossbar applications. Applied Physics Letters, 2012, 100, .	1.5	179
25	Electrical Performance and Scalability of Pt Dispersed SiO₂ Nanometallic Resistance Switch. Nano Letters, 2013, 13, 3213-3217.	4.5	175
26	Local Temperature Redistribution and Structural Transition During Jouleâ€Heatingâ€Driven Conductance Switching in VO₂. Advanced Materials, 2013, 25, 6128-6132.	11.1	173
27	Rescuing Memristor-based Neuromorphic Design with High Defects. , 2017, , .		158
28	Time-Resolved Imaging of Spin Transfer Switching: Beyond the Macrospin Concept. Physical Review Letters, 2006, 96, 217202.	2.9	156
29	Dynamical memristors for higher-complexity neuromorphic computing. Nature Reviews Materials, 2022, 7, 575-591.	23.3	155
30	Metal/TiO2 interfaces for memristive switches. Applied Physics A: Materials Science and Processing, 2011, 102, 785-789.	1.1	138
31	Physical origins of current and temperature controlled negative differential resistances in NbO2. Nature Communications, 2017, 8, 658.	5.8	133
32	Repeatable, accurate, and high speed multi-level programming of memristor 1T1R arrays for power efficient analog computing applications. Nanotechnology, 2016, 27, 365202.	1.3	130
33	Continuous Electrical Tuning of the Chemical Composition of TaO_{<i>x</i>}-Based Memristors. ACS Nano, 2012, 6, 2312-2318.	7.3	119
34	Diffusion of Adhesion Layer Metals Controls Nanoscale Memristive Switching. Advanced Materials, 2010, 22, 4034-4038.	11.1	104
35	The switching location of a bipolar memristor: chemical, thermal and structural mapping. Nanotechnology, 2011, 22, 254015.	1.3	101
36	Measuring the switching dynamics and energy efficiency of tantalum oxide memristors. Nanotechnology, 2011, 22, 505402.	1.3	99

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37	Conduction Channel Formation and Dissolution Due to Oxygen Thermophoresis/Diffusion in Hafnium Oxide Memristors. ACS Nano, 2016, 10, 11205-11210.	7.3	97
38	Voltage divider effect for the improvement of variability and endurance of TaOx memristor. Scientific Reports, 2016, 6, 20085.	1.6	93
39	Direct Observation of Localized Radial Oxygen Migration in Functioning Tantalum Oxide Memristors. Advanced Materials, 2016, 28, 2772-2776.	11.1	92
40	Analog content-addressable memories with memristors. Nature Communications, 2020, 11, 1638.	5.8	86
41	Spectromicroscopy of tantalum oxide memristors. Applied Physics Letters, 2011, 98, .	1.5	85
42	Sequential Electronic and Structural Transitions in VO₂ Observed Using Xâ€ray Absorption Spectromicroscopy. Advanced Materials, 2014, 26, 7505-7509.	11.1	77
43	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
44	Lowâ€Conductance and Multilevel CMOSâ€Integrated Nanoscale Oxide Memristors. Advanced Electronic Materials, 2019, 5, 1800876.	2.6	67
45	Dopant Control by Atomic Layer Deposition in Oxide Films for Memristive Switches. Chemistry of Materials, 2011, 23, 123-125.	3.2	65
46	Oxygen migration during resistance switching and failure of hafnium oxide memristors. Applied Physics Letters, 2017, 110, .	1.5	64
47	Characterization of electroforming-free titanium dioxide memristors. Beilstein Journal of Nanotechnology, 2013, 4, 467-473.	1.5	60
48	History Erase Effect in a Non-Volatile Memristor. IEEE Transactions on Circuits and Systems I: Regular Papers, 2016, 63, 389-400.	3.5	60
49	Structural and chemical characterization of TiO2memristive devices by spatially-resolved NEXAFS. Nanotechnology, 2009, 20, 485701.	1.3	58
50	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
51	Hybrid CMOS/memristor circuits. , 2010, , .		57
52	Redox-based memristive devices for new computing paradigm. APL Materials, 2019, 7, 110903.	2.2	55
53	Inâ€Memory Computing with Memristor Content Addressable Memories for Pattern Matching. Advanced Materials, 2020, 32, e2003437.	11.1	54
54	PANTHER: A Programmable Architecture for Neural Network Training Harnessing Energy-Efficient ReRAM. IEEE Transactions on Computers, 2020, 69, 1128-1142.	2.4	54

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55	Newton: Gravitating Towards the Physical Limits of Crossbar Acceleration. IEEE Micro, 2018, 38, 41-49.	1.8	44
56	Tree-based machine learning performed in-memory with memristive analog CAM. Nature Communications, 2021, 12, 5806.	5.8	44
57	CMOS interface circuits for reading and writing memristor crossbar array. , 2011, , .		42
58	Direct Observation of Spin-Torque Driven Magnetization Reversal through Nonuniform Modes. Physical Review Letters, 2008, 100, 247201.	2.9	41
59	Software defined photon counting system for time resolved x-ray experiments. Review of Scientific Instruments, 2007, 78, 014702.	0.6	39
60	Force modulation of tunnel gaps in metal oxide memristive nanoswitches. Applied Physics Letters, 2009, 95, 113503.	1.5	38
61	Temperature and field-dependent transport measurements in continuously tunable tantalum oxide memristors expose the dominant state variable. Applied Physics Letters, 2017, 110, .	1.5	38
62	Looking Ahead for Resistive Memory Technology: A broad perspective on ReRAM technology for future storage and computing. IEEE Consumer Electronics Magazine, 2017, 6, 94-103.	2.3	31
63	Memristor TCAMs Accelerate Regular Expression Matching for Network Intrusion Detection. IEEE Nanotechnology Magazine, 2019, 18, 963-970.	1.1	30
64	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
65	Physics-based memristor models. , 2013, , .		26
66	Dot-product engine as computing memory to accelerate machine learning algorithms. , 2016, , .		26
67	In-Memory Computing with Memristor Arrays. , 2018, , .		26
68	In-operando synchronous time-multiplexed O K-edge x-ray absorption spectromicroscopy of functioning tantalum oxide memristors. Journal of Applied Physics, 2015, 118, .	1.1	25
69	The phase transition in VO2 probed using x-ray, visible and infrared radiations. Applied Physics Letters, 2016, 108, .	1.5	25
70	Spatially uniform resistance switching of low current, high endurance titaniumâ€“niobium-oxide memristors. Nanoscale, 2017, 9, 1793-1798.	2.8	25
71	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
72	Hardware-Software Co-Design for an Analog-Digital Accelerator for Machine Learning. , 2018, , .		20

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73	Redundancy and Analog Slicing for Precise In-Memory Machine Learningâ€"Part I: Programming Techniques. IEEE Transactions on Electron Devices, 2021, 68, 4373-4378.	1.6	16
74	CMOS-integrated nanoscale memristive crossbars for CNN and optimization acceleration. , 2020, , .		15
75	Large Memristor Crossbars for Analog Computing. , 2018, , .		14
76	Volatile HRS asymmetry and subloops in resistive switching oxides. Nanoscale, 2017, 9, 14414-14422.	2.8	11
77	Band offsets in transition-metal oxide heterostructures. Journal Physics D: Applied Physics, 2013, 46, 295303.	1.3	10
78	Time-resolved x-ray imaging of magnetization dynamics in spin-transfer torque devices. Physical Review B, 2009, 80, .	1.1	8
79	Accelerating Discrete Fourier Transforms with dot-product engine. , 2016, , .		8
80	Regular Expression Matching with Memristor TCAMs. , 2018, , .		8
81	Regular Expression Matching with Memristor TCAMs for Network Security. , 2018, , .		8
82	Computing In-Memory, Revisited. , 2018, , .		8
83	Redundancy and Analog Slicing for Precise In-Memory Machine Learningâ€"Part II: Applications and Benchmark. IEEE Transactions on Electron Devices, 2021, 68, 4379-4383.	1.6	8
84	Generalize or Die: Operating Systems Support for Memristor-Based Accelerators. , 2017, , .		7
85	Synchronized and configurable source of electrical pulses for x-ray pump-probe experiments. Review of Scientific Instruments, 2007, 78, 054703.	0.6	6
86	Memristive Devices for Computing: Mechanisms, Applications and Challenges. ECS Transactions, 2013, 58, 9-14.	0.3	6
87	The Art and Science of Constructing a Memristor Model: Updated. , 2019, , 267-285.		3
88	Differentiable Content Addressable Memory with Memristors. Advanced Electronic Materials, 2022, 8, .	2.6	3
89	In-Memory Computing with Non-volatile Memristor CAM Circuits. , 2022, , 105-139.		2
90	Oxide based memristive devices. , 2012, , .		1

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91	Designing memristors: Physics, materials science and engineering. , 2012, , .		1
92	Future Computing Systems (FCS) to Support "Understanding" Capability. , 2019, , .		1
93	Fast Ising solvers based on oscillator networks. Nature Electronics, 2021, 4, 458-459.	13.1	1
94	Prospects for Analog Circuits in Deep Networks. , 2022, , 49-61.		1
95	FPGA Demonstrator of a Programmable Ultra-Efficient Memristor-Based Machine Learning Inference Accelerator. , 2019, , .		0
96	Fading Memory Effects in a Memristor for Cellular Nanoscale Network Applications. , 2016, , .		0
97	Defect tolerant in-memory analog computing with CMOS-integrated nanoscale crossbars: Invited. , 2021, , .		0