John Paul Strachan

List of Publications by Year in Descending Order

93 papers	10,527 citations	46 h-index	98 g-index
98 ext. papers	12,972 ext. citations	12.2 avg, IF	6.44 L-index

#	Paper	IF	Citations
93	Prospects for Analog Circuits in Deep Networks **2022**, 49-61		
92	In-Memory Computing with Non-volatile Memristor CAM Circuits **2022**, 105-139		1
91	Tree-based machine learning performed in-memory with memristive analog CAM. *Nature Communications*, **2021**, 12, 5806	17.4	8
90	Redundancy and Analog Slicing for Precise In-Memory Machine Learning—Part II: Applications and Benchmark. *IEEE Transactions on Electron Devices*, **2021**, 68, 4379-4383	2.9	4
89	Redundancy and Analog Slicing for Precise In-Memory Machine Learning—Part I: Programming Techniques. *IEEE Transactions on Electron Devices*, **2021**, 68, 4373-4378	2.9	8
88	CMOS-integrated nanoscale memristive crossbars for CNN and optimization acceleration **2020**,		7
87	. *IEEE Transactions on Computers*, **2020**, 69, 1128-1142	2.5	18
86	Power-efficient combinatorial optimization using intrinsic noise in memristor Hopfield neural networks. *Nature Electronics*, **2020**, 3, 409-418	28.4	79
85	Analog content-addressable memories with memristors. *Nature Communications*, **2020**, 11, 1638	17.4	28
84	In-Memory Computing with Memristor Content Addressable Memories for Pattern Matching. *Advanced Materials*, **2020**, 32, e2003437	24	27
83	Memristor TCAMs Accelerate Regular Expression Matching for Network Intrusion Detection. *IEEE Nanotechnology Magazine*, **2019**, 18, 963-970	2.6	17
82	In situ training of feed-forward and recurrent convolutional memristor networks. *Nature Machine Intelligence*, **2019**, 1, 434-442	22.5	93
81	Low-Conductance and Multilevel CMOS-Integrated Nanoscale Oxide Memristors. *Advanced Electronic Materials*, **2019**, 5, 1800876	6.4	46
80	Reinforcement learning with analogue memristor arrays. *Nature Electronics*, **2019**, 2, 115-124	28.4	166
79	PUMA **2019**,		107
78	The Art and Science of Constructing a Memristor Model: Updated **2019**, 267-285		3
77	Redox-based memristive devices for new computing paradigm. *APL Materials*, **2019**, 7, 110903	5.7	28

76	**2019**,		1
75	Long short-term memory networks in memristor crossbar arrays. *Nature Machine Intelligence*, **2019**, 1, 49-57	22.5	176
74	Fully memristive neural networks for pattern classification with unsupervised learning. *Nature Electronics*, **2018**, 1, 137-145	28.4	511
73	The future of electronics based on memristive systems. *Nature Electronics*, **2018**, 1, 22-29	28.4	813
72	Memristor-Based Analog Computation and Neural Network Classification with a Dot Product Engine. *Advanced Materials*, **2018**, 30, 1705914	24	339
71	Computing In-Memory, Revisited **2018**,		4
70	Large Memristor Crossbars for Analog Computing **2018**,		6
69	Capacitive neural network with neuro-transistors. *Nature Communications*, **2018**, 9, 3208	17.4	132
68	Efficient and self-adaptive in-situ learning in multilayer memristor neural networks. *Nature Communications*, **2018**, 9, 2385	17.4	371
67	Analogue signal and image processing with large memristor crossbars. *Nature Electronics*, **2018**, 1, 52-59	28.4	550
66	Regular Expression Matching with Memristor TCAMs **2018**,		4
65	Hardware-Software Co-Design for an Analog-Digital Accelerator for Machine Learning **2018**,		10
64	Regular Expression Matching with Memristor TCAMs for Network Security **2018**,		2
63	Newton: Gravitating Towards the Physical Limits of Crossbar Acceleration. *IEEE Micro*, **2018**, 38, 41-49	1.8	25
62	In-Memory Computing with Memristor Arrays **2018**,		12
61	An efficient analog Hamming distance comparator realized with a unipolar memristor array: a showcase of physical computing. *Scientific Reports*, **2017**, 7, 40135	4.9	22
60	Oxygen migration during resistance switching and failure of hafnium oxide memristors. *Applied Physics Letters*, **2017**, 110, 103503	3.4	49
59	Temperature and field-dependent transport measurements in continuously tunable tantalum oxide memristors expose the dominant state variable. *Applied Physics Letters*, **2017**, 110, 123501	3.4	31

58	. *IEEE Consumer Electronics Magazine*, **2017**, 6, 94-103	3.2	17
57	Volatile HRS asymmetry and subloops in resistive switching oxides. *Nanoscale*, **2017**, 9, 14414-14422	7.7	8
56	Physical origins of current and temperature controlled negative differential resistances in NbO. *Nature Communications*, **2017**, 8, 658	17.4	94
55	Chaotic dynamics in nanoscale NbO Mott memristors for analogue computing. *Nature*, **2017**, 548, 318-321	50.4	296
54	Rescuing Memristor-based Neuromorphic Design with High Defects **2017**,		88
53	Memristors with diffusive dynamics as synaptic emulators for neuromorphic computing. *Nature Materials*, **2017**, 16, 101-108	27	1201
52	Spatially uniform resistance switching of low current, high endurance titanium-niobium-oxide memristors. *Nanoscale*, **2017**, 9, 1793-1798	7.7	18
51	Generalize or Die: Operating Systems Support for Memristor-Based Accelerators **2017**,		6
50	Dot-product engine for neuromorphic computing **2016**,		303
49	Conduction Channel Formation and Dissolution Due to Oxygen Thermophoresis/Diffusion in Hafnium Oxide Memristors. *ACS Nano*, **2016**, 10, 11205-11210	16.7	75
48	Valence Change Observed by Nanospectroscopy and Spectromicroscopy **2016**, 437-456		1
47	Accelerating Discrete Fourier Transforms with dot-product engine **2016**,		5
46	ISAAC: A Convolutional Neural Network Accelerator with In-Situ Analog Arithmetic in Crossbars **2016**,		147
45	Direct Observation of Localized Radial Oxygen Migration in Functioning Tantalum Oxide Memristors. *Advanced Materials*, **2016**, 28, 2772-6	24	80
44	High-Speed and Low-Energy Nitride Memristors. *Advanced Functional Materials*, **2016**, 26, 5290-5296	15.6	177
43	Dot-product engine as computing memory to accelerate machine learning algorithms **2016**,		18
42	ISAAC. *Computer Architecture News*, **2016**, 44, 14-26		570
41	Voltage divider effect for the improvement of variability and endurance of TaO(x) memristor. *Scientific Reports*, **2016**, 6, 20085	4.9	70

40	The phase transition in VO2 probed using x-ray, visible and infrared radiations. *Applied Physics Letters*, **2016**, 108, 073102	3.4	20
39	History Erase Effect in a Non-Volatile Memristor. *IEEE Transactions on Circuits and Systems I: Regular Papers*, **2016**, 63, 389-400	3.9	39
38	Repeatable, accurate, and high speed multi-level programming of memristor 1T1R arrays for power efficient analog computing applications. *Nanotechnology*, **2016**, 27, 365202	3.4	84
37	In-operando synchronous time-multiplexed O K-edge x-ray absorption spectromicroscopy of functioning tantalum oxide memristors. *Journal of Applied Physics*, **2015**, 118, 034502	2.5	23
36	Sequential electronic and structural transitions in VO2 observed using X-ray absorption spectromicroscopy. *Advanced Materials*, **2014**, 26, 7505-9	24	67
35	Physics-based memristor models **2013**,		21
34	Memristive Devices for Computing: Mechanisms, Applications and Challenges. *ECS Transactions*, **2013**, 58, 9-14	1	6
33	Electrical performance and scalability of Pt dispersed SiO2 nanometallic resistance switch. *Nano Letters*, **2013**, 13, 3213-7	11.5	146
32	Memristor structures for high scalability: Non-linear and symmetric devices utilizing fabrication friendly materials and processes. *Microelectronic Engineering*, **2013**, 103, 66-69	2.5	19
31	State Dynamics and Modeling of Tantalum Oxide Memristors. *IEEE Transactions on Electron Devices*, **2013**, 60, 2194-2202	2.9	120
30	Local temperature redistribution and structural transition during joule-heating-driven conductance switching in VO2. *Advanced Materials*, **2013**, 25, 6128-32	24	139
29	Band offsets in transition-metal oxide heterostructures. *Journal Physics D: Applied Physics*, **2013**, 46, 295303		10
28	Characterization of electroforming-free titanium dioxide memristors. *Beilstein Journal of Nanotechnology*, **2013**, 4, 467-73	3	54
27	Engineering nonlinearity into memristors for passive crossbar applications. *Applied Physics Letters*, **2012**, 100, 113501	3.4	162
26	Continuous electrical tuning of the chemical composition of TaO(x)-based memristors. *ACS Nano*, **2012**, 6, 2312-8	16.7	100
25	Designing memristors: Physics, materials science and engineering **2012**,		1
24	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	2.6	47
23	Measuring the switching dynamics and energy efficiency of tantalum oxide memristors. *Nanotechnology*, **2011**, 22, 505402	3.4	85

22	Sub-nanosecond switching of a tantalum oxide memristor. *Nanotechnology*, **2011**, 22, 485203	3.4	506
21	Dopant Control by Atomic Layer Deposition in Oxide Films for Memristive Switches. *Chemistry of Materials*, **2011**, 23, 123-125	9.6	56
20	CMOS interface circuits for reading and writing memristor crossbar array **2011**,		38
19	The switching location of a bipolar memristor: chemical, thermal and structural mapping. *Nanotechnology*, **2011**, 22, 254015	3.4	82
18	Metal/TiO2 interfaces for memristive switches. *Applied Physics A: Materials Science and Processing*, **2011**, 102, 785-789	2.6	128
17	Anatomy of a nanoscale conduction channel reveals the mechanism of a high-performance memristor. *Advanced Materials*, **2011**, 23, 5633-40	24	338
16	Spectromicroscopy of tantalum oxide memristors. *Applied Physics Letters*, **2011**, 98, 242114	3.4	77
15	Hybrid CMOS/memristor circuits **2010**,		39
14	High switching endurance in TaOx memristive devices. *Applied Physics Letters*, **2010**, 97, 232102	3.4	467
13	Morphological and electrical changes in TiO2 memristive devices induced by electroforming and switching. *Physica Status Solidi - Rapid Research Letters*, **2010**, 4, 16-18	2.5	59
12	Direct identification of the conducting channels in a functioning memristive device. *Advanced Materials*, **2010**, 22, 3573-7	24	278
11	Diffusion of adhesion layer metals controls nanoscale memristive switching. *Advanced Materials*, **2010**, 22, 4034-8	24	95
10	Time-resolved x-ray imaging of magnetization dynamics in spin-transfer torque devices. *Physical Review B*, **2009**, 80,	3.3	7
9	Structural and chemical characterization of TiO2 memristive devices by spatially-resolved NEXAFS. *Nanotechnology*, **2009**, 20, 485701	3.4	52
8	Force modulation of tunnel gaps in metal oxide memristive nanoswitches. *Applied Physics Letters*, **2009**, 95, 113503	3.4	36
7	Direct observation of spin-torque driven magnetization reversal through nonuniform modes. *Physical Review Letters*, **2008**, 100, 247201	7.4	36
6	Software defined photon counting system for time resolved x-ray experiments. *Review of Scientific Instruments*, **2007**, 78, 014702	1.7	34
5	Synchronized and configurable source of electrical pulses for x-ray pump-probe experiments. *Review of Scientific Instruments*, **2007**, 78, 054703	1.7	6

4	Time-resolved imaging of spin transfer switching: beyond the macrospin concept. *Physical Review Letters*, **2006**, 96, 217202	7.4	138
3	2022 roadmap on neuromorphic computing and engineering. *Neuromorphic Computing and Engineering*,		24
2	Differentiable Content Addressable Memory with Memristors. *Advanced Electronic Materials*,2101198	6.4	
1	Dynamical memristors for higher-complexity neuromorphic computing. *Nature Reviews Materials*,	73.3	15