Steven H Collins

List of Publications by Year
in descending order

62 papers	6,291 citations	186265 28 h-index	206112 48 g-index
71 all docs	71 docs citations	71 times ranked	3898 citing authors

#	Article	IF	Citations
1	Efficient Bipedal Robots Based on Passive-Dynamic Walkers. Science, 2005, 307, 1082-1085.	12.6	1,624
2	Reducing the energy cost of human walking using an unpowered exoskeleton. Nature, 2015, 522, 212-215.	27.8	732
3	Human-in-the-loop optimization of exoskeleton assistance during walking. Science, 2017, 356, 1280-1284.	12.6	616
4	Combating COVID-19â€"The role of robotics in managing public health and infectious diseases. Science Robotics, 2020, 5, .	17.6	393
5	Dynamic arm swinging in human walking. Proceedings of the Royal Society B: Biological Sciences, 2009, 276, 3679-3688.	2.6	295
6	An experimental comparison of the relative benefits of work and torque assistance in ankle exoskeletons. Journal of Applied Physiology, 2015, 119, 541-557.	2.5	164
7	Recycling Energy to Restore Impaired Ankle Function during Human Walking. PLoS ONE, 2010, 5, e9307.	2.5	163
8	The effect of prosthetic foot push-off on mechanical loading associated with knee osteoarthritis in lower extremity amputees. Gait and Posture, 2011, 34, 502-507.	1.4	137
9	A Universal Ankleâ€"Foot Prosthesis Emulator for Human Locomotion Experiments. Journal of Biomechanical Engineering, 2014, 136, 035002.	1.3	118
10	Systematic Variation of Prosthetic Foot Spring Affects Center-of-Mass Mechanics and Metabolic Cost During Walking. IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2011, 19, 411-419.	4.9	115
11	Two Independent Contributions to Step Variability during Over-Ground Human Walking. PLoS ONE, 2013, 8, e73597.	2.5	101
12	Improving the energy economy of human running with powered and unpowered ankle exoskeleton assistance. Science Robotics, 2020, 5, .	17.6	100
13	A simple method for calibrating force plates and force treadmills using an instrumented pole. Gait and Posture, 2009, 29, 59-64.	1.4	86
14	Increasing ankle push-off work with a powered prosthesis does not necessarily reduce metabolic rate for transtibial amputees. Journal of Biomechanics, 2016, 49, 3452-3459.	2.1	86
15	The effects of a controlled energy storage and return prototype prosthetic foot on transtibial amputee ambulation. Human Movement Science, 2012, 31, 918-931.	1.4	80
16	Prosthetic ankle push-off work reduces metabolic rate but not collision work in non-amputee walking. Scientific Reports, 2014, 4, 7213.	3.3	80
17	Design of two lightweight, high-bandwidth torque-controlled ankle exoskeletons. , 2015, , .		80
18	A lightweight, low-power electroadhesive clutch and spring for exoskeleton actuation. , 2016, , .		79

#	Article	IF	Citations
19	The influence of push-off timing in a robotic ankle-foot prosthesis on the energetics and mechanics of walking. Journal of NeuroEngineering and Rehabilitation, 2015, 12, 21.	4.6	76
20	Experimental comparison of torque control methods on an ankle exoskeleton during human walking. , 2015, , .		75
21	Muscle-tendon mechanics explain unexpected effects of exoskeleton assistance on metabolic rate during walking. Journal of Experimental Biology, 2017, 220, 2082-2095.	1.7	73
22	Once-per-step control of ankle-foot prosthesis push-off work reduces effort associated with balance during walking. Journal of NeuroEngineering and Rehabilitation, 2015, 12, 43.	4.6	71
23	How adaptation, training, and customization contribute to benefits from exoskeleton assistance. Science Robotics, 2021, 6, eabf1078.	17.6	65
24	A hipâ€"kneeâ€"ankle exoskeleton emulator for studying gait assistance. International Journal of Robotics Research, 2021, 40, 722-746.	8.5	63
25	The effects of electroadhesive clutch design parameters on performance characteristics. Journal of Intelligent Material Systems and Structures, 2018, 29, 3804-3828.	2.5	56
26	Muscle recruitment and coordination with an ankle exoskeleton. Journal of Biomechanics, 2017, 59, 50-58.	2.1	53
27	Once-Per-Step Control of Ankle Push-Off Work Improves Balance in a Three-Dimensional Simulation of Bipedal Walking. IEEE Transactions on Robotics, 2017, 33, 406-418.	10.3	50
28	Heuristic-Based Ankle Exoskeleton Control for Co-Adaptive Assistance of Human Locomotion. IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2019, 27, 2059-2069.	4.9	49
29	Ankle fixation need not increase the energetic cost of human walking. Gait and Posture, 2008, 28, 427-433.	1.4	41
30	Optimizing Exoskeleton Assistance for Faster Self-Selected Walking. IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2021, 29, 786-795.	4.9	41
31	Sensing leg movement enhances wearable monitoring of energy expenditure. Nature Communications, 2021, 12, 4312.	12.8	33
32	Design of a lightweight, tethered, torque-controlled knee exoskeleton. , 2017, 2017, 1646-1653.		32
33	Step-to-Step Ankle Inversion/Eversion Torque Modulation Can Reduce Effort Associated with Balance. Frontiers in Neurorobotics, 2017, 11, 62.	2.8	27
34	An Ankleâ€"Foot Prosthesis Emulator With Control of Plantarflexion and Inversionâ€"Eversion Torque. IEEE Transactions on Robotics, 2018, 34, 1183-1194.	10.3	25
35	Comparing optimized exoskeleton assistance of the hip, knee, and ankle in single and multi-joint configurations. Wearable Technologies, 2021, 2, .	3.1	25
36	Design of a Hip Exoskeleton With Actuation in Frontal and Sagittal Planes. IEEE Transactions on Medical Robotics and Bionics, 2021, 3, 773-782.	3.2	24

#	Article	IF	Citations
37	Rapid energy expenditure estimation for ankle assisted and inclined loaded walking. Journal of NeuroEngineering and Rehabilitation, 2019, 16, 67.	4.6	23
38	An experimental robotic testbed for accelerated development of ankle prostheses. , 2013, , .		22
39	An ankle-foot prosthesis emulator with control of plantarflexion and inversion-eversion torque. , 2015, , .		22
40	An Ankle-Foot Prosthesis Emulator Capable of Modulating Center of Pressure. IEEE Transactions on Biomedical Engineering, 2020, 67, 166-176.	4.2	22
41	General variability leads to specific adaptation toward optimal movement policies. Current Biology, 2022, 32, 2222-2232.e5.	3.9	22
42	The Passive Series Stiffness That Optimizes Torque Tracking for a Lower-Limb Exoskeleton in Human Walking. Frontiers in Neurorobotics, 2017, 11, 68.	2.8	21
43	Testing Simulated Assistance Strategies on a Hip-Knee-Ankle Exoskeleton: a Case Study. , 2020, , .		20
44	Optimized hipâ€"kneeâ€"ankle exoskeleton assistance at a range of walking speeds. Journal of NeuroEngineering and Rehabilitation, 2021, 18, 152.	4.6	19
45	Torque Control in Legged Locomotion âŽ âŽSupplementary document of this chapter is located at https://www.andrew.cmu.edu/user/shc17/Zhang_2016_BLLâ€"SuppMat.pdf.. , 2017, , 347-400.		18
46	Using force data to self-pace an instrumented treadmill and measure self-selected walking speed. Journal of NeuroEngineering and Rehabilitation, 2020, 17, 68.	4.6	18
47	Shortcomings of human-in-the-loop optimization of an ankle-foot prosthesis emulator: a case series. Royal Society Open Science, 2021, 8, 202020.	2.4	17
48	Informing ankle-foot prosthesis prescription through haptic emulation of candidate devices. , 2015, 2015, 6445-6450.		14
49	Design of Lower-Limb Exoskeletons and Emulator Systems. , 2020, , 251-274.		14
50	The Effects of Prosthesis Inversion/Eversion Stiffness on Balance-Related Variability During Level Walking: A Pilot Study. Journal of Biomechanical Engineering, 2020, 142, .	1.3	14
51	Optimized hip-knee-ankle exoskeleton assistance reduces the metabolic cost of walking with worn loads. Journal of NeuroEngineering and Rehabilitation, 2021, 18, 161.	4.6	13
52	Stabilization of a three-dimensional limit cycle walking model through step-to-step ankle control. , 2013, 2013, 6650437.		11
53	Self-selected step length asymmetry is not explained by energy cost minimization in individuals with chronic stroke. Journal of NeuroEngineering and Rehabilitation, 2020, 17, 119.	4.6	10
54	The Iterative Learning Gain That Optimizes Real-Time Torque Tracking for Ankle Exoskeletons in Human Walking Under Gait Variations. Frontiers in Neurorobotics, 2021, 15, 653409.	2.8	10

#	Article	IF	Citations
55	Lower limb active prosthetic systemsâ€"overview. , 2020, , 469-486.		8
56	Teleoperation of an Ankle-Foot Prosthesis With a Wrist Exoskeleton. IEEE Transactions on Biomedical Engineering, 2021, 68, 1714-1725.	4.2	8
57	Characterizing the relationship between peak assistance torque and metabolic cost reduction during running with ankle exoskeletons. Journal of NeuroEngineering and Rehabilitation, 2022, 19, 46.	4.6	8
58	The effects of ground-irregularity-cancelling prosthesis control on balance over uneven surfaces. Royal Society Open Science, 2021, 8, 201235.	2.4	5
59	The energy cost of split-belt walking for a variety of belt speed combinations. Journal of Biomechanics, 2022, 132, 110905.	2.1	4
60	What do walking humans want from mechatronics?. , 2013, , .		3
61	Five years of <i>Science Robotics</i>. Science Robotics, 2021, 6, eabn2720.	17.6	2
62	Human Perception of Wrist Torque Magnitude During Upper and Lower Extremity Movement. , 2021, , .		0