

Leigh R Hochberg

List of Publications by Year in descending order

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124
papers

14,427
citations

50170

46
h-index

30010

103
g-index

142
all docs

142
docs citations

142
times ranked

9082
citing authors

#	ARTICLE	IF	CITATIONS
1	Neuronal ensemble control of prosthetic devices by a human with tetraplegia. <i>Nature</i> , 2006, 442, 164-171.	13.7	2,979
2	Reach and grasp by people with tetraplegia using a neurally controlled robotic arm. <i>Nature</i> , 2012, 485, 372-375.	13.7	2,186
3	Restoration of reaching and grasping movements through brain-controlled muscle stimulation in a person with tetraplegia: a proof-of-concept demonstration. <i>Lancet, The</i> , 2017, 389, 1821-1830.	6.3	632
4	Single-neuron dynamics in human focal epilepsy. <i>Nature Neuroscience</i> , 2011, 14, 635-641.	7.1	449
5	Neural control of cursor trajectory and click by a human with tetraplegia 1000 days after implant of an intracortical microelectrode array. <i>Journal of Neural Engineering</i> , 2011, 8, 025027.	1.8	429
6	High-performance brain-to-text communication via handwriting. <i>Nature</i> , 2021, 593, 249-254.	13.7	409
7	Inferring single-trial neural population dynamics using sequential auto-encoders. <i>Nature Methods</i> , 2018, 15, 805-815.	9.0	388
8	High performance communication by people with paralysis using an intracortical brain-computer interface. <i>ELife</i> , 2017, 6, .	2.8	367
9	Rapid fragmentation of neuronal networks at the onset of propofol-induced unconsciousness. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2012, 109, E3377-86.	3.3	366
10	Neural control of computer cursor velocity by decoding motor cortical spiking activity in humans with tetraplegia. <i>Journal of Neural Engineering</i> , 2008, 5, 455-476.	1.8	342
11	Clinical translation of a high-performance neural prosthesis. <i>Nature Medicine</i> , 2015, 21, 1142-1145.	15.2	269
12	Virtual typing by people with tetraplegia using a self-calibrating intracortical brain-computer interface. <i>Science Translational Medicine</i> , 2015, 7, 313ra179.	5.8	249
13	Early detection of consciousness in patients with acute severe traumatic brain injury. <i>Brain</i> , 2017, 140, 2399-2414.	3.7	244
14	Primary Motor Cortex Tuning to Intended Movement Kinematics in Humans with Tetraplegia. <i>Journal of Neuroscience</i> , 2008, 28, 1163-1178.	1.7	216
15	Collective dynamics in human and monkey sensorimotor cortex: predicting single neuron spikes. <i>Nature Neuroscience</i> , 2010, 13, 105-111.	7.1	202
16	Human seizures self-terminate across spatial scales via a critical transition. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2012, 109, 21116-21121.	3.3	182
17	Vagus nerve stimulation paired with rehabilitation for upper limb motor function after ischaemic stroke (VNS-REHAB): a randomised, blinded, pivotal, device trial. <i>Lancet, The</i> , 2021, 397, 1545-1553.	6.3	181
18	Intra-day signal instabilities affect decoding performance in an intracortical neural interface system. <i>Journal of Neural Engineering</i> , 2013, 10, 036004.	1.8	180

#	ARTICLE	IF	CITATIONS
19	Heterogeneous neuronal firing patterns during interictal epileptiform discharges in the human cortex. <i>Brain</i> , 2010, 133, 1668-1681.	3.7	168
20	Assistive technology and robotic control using motor cortex ensemble-based neural interface systems in humans with tetraplegia. <i>Journal of Physiology</i> , 2007, 579, 603-611.	1.3	166
21	Spatiotemporal dynamics of neocortical excitation and inhibition during human sleep. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2012, 109, 1731-1736.	3.3	166
22	Point-and-Click Cursor Control With an Intracortical Neural Interface System by Humans With Tetraplegia. <i>IEEE Transactions on Neural Systems and Rehabilitation Engineering</i> , 2011, 19, 193-203.	2.7	149
23	Speech-Specific Tuning of Neurons in Human Superior Temporal Gyrus. <i>Cerebral Cortex</i> , 2014, 24, 2679-2693.	1.6	121
24	Listening to Brain Microcircuits for Interfacing With External World—Progress in Wireless Implantable Microelectronic Neuroengineering Devices. <i>Proceedings of the IEEE</i> , 2010, 98, 375-388.	16.4	114
25	Large-scale neural recordings with single neuron resolution using Neuropixels probes in human cortex. <i>Nature Neuroscience</i> , 2022, 25, 252-263.	7.1	112
26	Sensors and Decoding for Intracortical Brain Computer Interfaces. <i>Annual Review of Biomedical Engineering</i> , 2013, 15, 383-405.	5.7	110
27	Cortical control of a tablet computer by people with paralysis. <i>PLoS ONE</i> , 2018, 13, e0204566.	1.1	108
28	Motor neuroprosthesis implanted with neurointerventional surgery improves capacity for activities of daily living tasks in severe paralysis: first in-human experience. <i>Journal of NeuroInterventional Surgery</i> , 2021, 13, 102-108.	2.0	106
29	Neuronal Ensemble Synchrony during Human Focal Seizures. <i>Journal of Neuroscience</i> , 2014, 34, 9927-9944.	1.7	103
30	Hand Knob Area of Premotor Cortex Represents the Whole Body in a Compositional Way. <i>Cell</i> , 2020, 181, 396-409.e26.	13.5	101
31	Sensors for brain-computer interfaces. <i>IEEE Engineering in Medicine and Biology Magazine</i> , 2006, 25, 32-38.	1.1	100
32	Rapid calibration of an intracortical brain-computer interface for people with tetraplegia. <i>Journal of Neural Engineering</i> , 2018, 15, 026007.	1.8	95
33	Reliability of directional information in unsorted spikes and local field potentials recorded in human motor cortex. <i>Journal of Neural Engineering</i> , 2014, 11, 046007.	1.8	92
34	Continuous neuronal ensemble control of simulated arm reaching by a human with tetraplegia. <i>Journal of Neural Engineering</i> , 2011, 8, 034003.	1.8	91
35	Stable long-term BCI-enabled communication in ALS and locked-in syndrome using LFP signals. <i>Journal of Neurophysiology</i> , 2018, 120, 343-360.	0.9	91
36	Efficient Decoding With Steady-State Kalman Filter in Neural Interface Systems. <i>IEEE Transactions on Neural Systems and Rehabilitation Engineering</i> , 2011, 19, 25-34.	2.7	88

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37	Neural Point-and-Click Communication by a Person With Incomplete Locked-In Syndrome. <i>Neurorehabilitation and Neural Repair</i> , 2015, 29, 462-471.	1.4	84
38	Advantages of closed-loop calibration in intracortical brain-computer interfaces for people with tetraplegia. <i>Journal of Neural Engineering</i> , 2013, 10, 046012.	1.8	83
39	Home Use of a Percutaneous Wireless Intracortical Brain-Computer Interface by Individuals With Tetraplegia. <i>IEEE Transactions on Biomedical Engineering</i> , 2021, 68, 2313-2325.	2.5	83
40	Review: Human Intracortical Recording and Neural Decoding for Brain-Computer Interfaces. <i>IEEE Transactions on Neural Systems and Rehabilitation Engineering</i> , 2017, 25, 1687-1696.	2.7	80
41	The Emergence of Single Neurons in Clinical Neurology. <i>Neuron</i> , 2015, 86, 79-91.	3.8	74
42	Corticospinal Tract Injury Estimated From Acute Stroke Imaging Predicts Upper Extremity Motor Recovery After Stroke. <i>Stroke</i> , 2019, 50, 3569-3577.	1.0	70
43	Power-saving design opportunities for wireless intracortical brain-computer interfaces. <i>Nature Biomedical Engineering</i> , 2020, 4, 984-996.	11.6	66
44	Evolving Applications, Technological Challenges and Future Opportunities in Neuromodulation: Proceedings of the Fifth Annual Deep Brain Stimulation Think Tank. <i>Frontiers in Neuroscience</i> , 2017, 11, 734.	1.4	65
45	Neural ensemble dynamics in dorsal motor cortex during speech in people with paralysis. <i>ELife</i> , 2019, 8, .	2.8	64
46	Neural population dynamics in human motor cortex during movements in people with ALS. <i>ELife</i> , 2015, 4, e07436.	2.8	60
47	Decoding spoken English from intracortical electrode arrays in dorsal precentral gyrus. <i>Journal of Neural Engineering</i> , 2020, 17, 066007.	1.8	52
48	Intact Brain Network Function in an Unresponsive Patient with COVID-19. <i>Annals of Neurology</i> , 2020, 88, 851-854.	2.8	47
49	The neuroethics of disorders of consciousness: a brief history of evolving ideas. <i>Brain</i> , 2021, 144, 3291-3310.	3.7	44
50	An assistive decision-and-control architecture for force-sensitive hand-arm systems driven by human-machine interfaces. <i>International Journal of Robotics Research</i> , 2015, 34, 763-780.	5.8	43
51	Personalized Connectome Mapping to Guide Targeted Therapy and Promote Recovery of Consciousness in the Intensive Care Unit. <i>Neurocritical Care</i> , 2020, 33, 364-375.	1.2	42
52	Microscale spatiotemporal dynamics during neocortical propagation of human focal seizures. <i>NeuroImage</i> , 2015, 122, 114-130.	2.1	41
53	Feedback control policies employed by people using intracortical brain-computer interfaces. <i>Journal of Neural Engineering</i> , 2017, 14, 016001.	1.8	41
54	Prediction of Imagined Single-Joint Movements in a Person With High-Level Tetraplegia. <i>IEEE Transactions on Biomedical Engineering</i> , 2012, 59, 2755-2765.	2.5	39

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55	Unexpected Recovery of Function After Severe Traumatic Brain Injury: The Limits of Early Neuroimaging-Based Outcome Prediction. <i>Neurocritical Care</i> , 2013, 19, 364-375.	1.2	37
56	Replay of Learned Neural Firing Sequences during Rest in Human Motor Cortex. <i>Cell Reports</i> , 2020, 31, 107581.	2.9	37
57	Applications of brain-computer interfaces to the control of robotic and prosthetic arms. <i>Handbook of Clinical Neurology</i> / Edited By P J Vinken and G W Bruyn, 2020, 168, 87-99.	1.0	37
58	Feasibility of an EEG-based brain-computer interface in the intensive care unit. <i>Clinical Neurophysiology</i> , 2018, 129, 1519-1525.	0.7	33
59	Horizons in Prosthesis Development for the Restoration of Limb Function. <i>Journal of the American Academy of Orthopaedic Surgeons</i> , The, 2006, 14, S198-S204.	1.1	33
60	Non-causal spike filtering improves decoding of movement intention for intracortical BCIs. <i>Journal of Neuroscience Methods</i> , 2014, 236, 58-67.	1.3	28
61	BCI decoder performance comparison of an LSTM recurrent neural network and a Kalman filter in retrospective simulation. , 2019, , .		28
62	Principled BCI Decoder Design and Parameter Selection Using a Feedback Control Model. <i>Scientific Reports</i> , 2019, 9, 8881.	1.6	28
63	Learned Motor Patterns Are Replayed in Human Motor Cortex during Sleep. <i>Journal of Neuroscience</i> , 2022, 42, 5007-5020.	1.7	27
64	Signal processing methods for reducing artifacts in microelectrode brain recordings caused by functional electrical stimulation. <i>Journal of Neural Engineering</i> , 2018, 15, 026014.	1.8	26
65	Multi-state decoding of point-and-click control signals from motor cortical activity in a human with tetraplegia. , 2007, , .		24
66	Watch, Imagine, Attempt: Motor Cortex Single-Unit Activity Reveals Context-Dependent Movement Encoding in Humans With Tetraplegia. <i>Frontiers in Human Neuroscience</i> , 2018, 12, 450.	1.0	24
67	Somatosensory responses in a human motor cortex. <i>Journal of Neurophysiology</i> , 2013, 109, 2192-2204.	0.9	22
68	Speech-related dorsal motor cortex activity does not interfere with iBCI cursor control. <i>Journal of Neural Engineering</i> , 2020, 17, 016049.	1.8	21
69	Turning Thought into Action. <i>New England Journal of Medicine</i> , 2008, 359, 1175-1177.	13.9	20
70	Robust Closed-Loop Control of a Cursor in a Person with Tetraplegia using Gaussian Process Regression. <i>Neural Computation</i> , 2018, 30, 2986-3008.	1.3	20
71	Early Detection of Human Epileptic Seizures Based on Intracortical Microelectrode Array Signals. <i>IEEE Transactions on Biomedical Engineering</i> , 2020, 67, 817-831.	2.5	20
72	A Comparison of Intention Estimation Methods for Decoder Calibration in Intracortical Brain-Computer Interfaces. <i>IEEE Transactions on Biomedical Engineering</i> , 2018, 65, 2066-2078.	2.5	19

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73	Locked in, but not out?. <i>Neurology</i> , 2014, 82, 1852-1853.	1.5	17
74	Adaptive Offset Correction for Intracortical Brain-Computer Interfaces. <i>IEEE Transactions on Neural Systems and Rehabilitation Engineering</i> , 2014, 22, 239-248.	2.7	17
75	Inhibitory single neuron control of seizures and epileptic traveling waves in humans. <i>BMC Neuroscience</i> , 2014, 15, .	0.8	17
76	Retrospectively supervised click decoder calibration for self-calibrating point-and-click brain-computer interfaces. <i>Journal of Physiology (Paris)</i> , 2016, 110, 382-391.	2.1	17
77	BCI Users and Their Needs. , 2012, , 317-324.		16
78	Decoding Speech from Intracortical Multielectrode Arrays in Dorsal Arm/Hand Areas of Human Motor Cortex. , 2018, 2018, 93-97.		16
79	Cognitive Demands Influence Upper Extremity Motor Performance During Recovery From Acute Stroke. <i>Neurology</i> , 2021, 96, e2576-e2586.	1.5	16
80	Neural Representation of Observed, Imagined, and Attempted Grasping Force in Motor Cortex of Individuals with Chronic Tetraplegia. <i>Scientific Reports</i> , 2020, 10, 1429.	1.6	16
81	Continuous Control of the DLR Light-Weight Robot III by a Human with Tetraplegia Using the BrainGate2 Neural Interface System. <i>Springer Tracts in Advanced Robotics</i> , 2014, , 125-136.	0.3	15
82	Closed-loop cortical control of virtual reach and posture using Cartesian and joint velocity commands. <i>Journal of Neural Engineering</i> , 2019, 16, 026011.	1.8	14
83	The Discriminative Kalman Filter for Bayesian Filtering with Nonlinear and Nongaussian Observation Models. <i>Neural Computation</i> , 2020, 32, 969-1017.	1.3	13
84	Association of Modified Rankin Scale With Recovery Phenotypes in Patients With Upper Extremity Weakness After Stroke. <i>Neurology</i> , 2022, 98, .	1.5	13
85	Modulation Depth Estimation and Variable Selection in State-Space Models for Neural Interfaces. <i>IEEE Transactions on Biomedical Engineering</i> , 2015, 62, 570-581.	2.5	12
86	Feasibility of Automatic Error Detect-and-Undo System in Human Intracortical Brain-Computer Interfaces. <i>IEEE Transactions on Biomedical Engineering</i> , 2018, 65, 1771-1784.	2.5	12
87	Volitional control of single-electrode high gamma local field potentials by people with paralysis. <i>Journal of Neurophysiology</i> , 2019, 121, 1428-1450.	0.9	12
88	Auditory cues reveal intended movement information in middle frontal gyrus neuronal ensemble activity of a person with tetraplegia. <i>Scientific Reports</i> , 2021, 11, 98.	1.6	12
89	Implanted Neural Interfaces: Ethics in Treatment and Research. , 2013, , 235-250.		12
90	Brain-Computer Interfaces in Neurorecovery and Neurorehabilitation. <i>Seminars in Neurology</i> , 2021, 41, 206-216.	0.5	11

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91	Reprint of "Non-causal spike filtering improves decoding of movement intention for intracortical BCIs". Journal of Neuroscience Methods, 2015, 244, 94-103.	1.3	10
92	Signal-independent noise in intracortical brain-computer interfaces causes movement time properties inconsistent with Fitts' law. Journal of Neural Engineering, 2017, 14, 026010.	1.8	9
93	The Neural Representation of Force across Grasp Types in Motor Cortex of Humans with Tetraplegia. ENeuro, 2021, 8, ENEURO.0231-20.2020.	0.9	9
94	Arm Motor Recovery After Ischemic Stroke: A Focus on Clinically Distinct Trajectory Groups. Journal of Neurologic Physical Therapy, 2021, 45, 70-78.	0.7	9
95	Mixing decoded cursor velocity and position from an offline Kalman filter improves cursor control in people with tetraplegia. , 2013, , .		8
96	Brain-machine interface cursor position only weakly affects monkey and human motor cortical activity in the absence of arm movements. Scientific Reports, 2018, 8, 16357.	1.6	8
97	Intracortical neural activity distal to seizure-onset-areas predicts human focal seizures. PLoS ONE, 2019, 14, e0211847.	1.1	8
98	Responsive neurostimulation for focal motor status epilepticus. Annals of Clinical and Translational Neurology, 2021, 8, 1353-1361.	1.7	8
99	Early detection of human epileptic seizures based on intracortical local field potentials. , 2013, , 323-326.		7
100	Intuitive prosthetic limb control. Lancet, The, 2007, 369, 345-346.	6.3	6
101	Early detection of human focal seizures based on cortical multiunit activity. , 2014, 2014, 5796-9.		6
102	Predicting seizures from local field potentials recorded via intracortical microelectrode arrays. , 2016, 2016, 6353-6356.		6
103	Trends in BCI Research I: Brain-Computer Interfaces for Assessment of Patients with Locked-in Syndrome or Disorders of Consciousness. Springer Briefs in Electrical and Computer Engineering, 2017, , 105-125.	0.3	6
104	Effects of Peripheral Haptic Feedback on Intracortical Brain-Computer Interface Control and Associated Sensory Responses in Motor Cortex. IEEE Transactions on Haptics, 2021, 14, 762-775.	1.8	5
105	Braingate: Turning Thought into Action"First Experience with a Human Neuromotor Prosthesis. Neurosurgery, 2005, 57, 425-425.	0.6	4
106	Initial Surgical Experience with an Intracortical Microelectrode Array for Brain-computer Interface Applications. Neurosurgery, 2006, 59, 481.	0.6	4
107	Adaptive parametric spectral estimation with Kalman smoothing for online early seizure detection. , 2013, , 1410-1413.		3
108	Intracranial brain-computer interfaces for communication and control. , 2014, , 577-585.		3

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109	A useful communication in brain-computer interfaces. <i>Neurology</i> , 2018, 91, 109-110.	1.5	3
110	Designing a Neural Interface System to Restore Mobility. , 2009, , 229-242.		3
111	Application of system identification methods for decoding imagined single-joint movements in an individual with high tetraplegia. , 2010, 2010, 2678-81.		2
112	Towards the optimal design of an assistive communication interface with neural input. , 2012, , .		2
113	Development of a Manually Operated Communication System (MOCS) for patients in intensive care units. <i>AAC: Augmentative and Alternative Communication</i> , 2021, 37, 261-273.	0.8	2
114	Intracortical Brain-Computer Interfaces for the Restoration of Communication and Mobility. <i>Biophysical Journal</i> , 2013, 104, 376a.	0.2	1
115	194â€fHigh Performance Computer Cursor Control Using Neuronal Ensemble Recordings From the Motor Cortex of a Person With ALS. <i>Neurosurgery</i> , 2013, 60, 184.	0.6	1
116	Freedom of Speech. <i>New England Journal of Medicine</i> , 2021, 385, 278-279.	13.9	1
117	Next-generation BCIs: Brain-to-text Communication via Attempted Handwriting. , 2022, , .		1
118	West Nile Encephalitis in Massachusetts. <i>New England Journal of Medicine</i> , 2002, 346, 1030-1031.	13.9	0
119	Hyperacute stent placement in acute cervical internal carotid artery occlusions: the potential role of magnetic resonance imaging. <i>Journal of NeuroInterventional Surgery</i> , 2009, 1, 171-174.	2.0	0
120	Electrical stimulation approaches to stroke recovery. , 0, , 247-258.		0
121	Investigation of the Neural Dynamics of Human Motor Learning Using an Intracortical Brain Computer Interface. <i>Archives of Physical Medicine and Rehabilitation</i> , 2017, 98, e163.	0.5	0
122	Acute Stroke. , 2010, , 414-417.		0
123	Auditory-Reliant Intracortical Brain Computer Interfaces for Effector Control by a Person with Tetraplegia. <i>Communications in Computer and Information Science</i> , 2020, , 102-109.	0.4	0
124	Restoring Functional Reach-to-Grasp in a Person with Chronic Tetraplegia Using Implanted Functional Electrical Stimulation and Intracortical Brain-Computer Interfaces. <i>Springer Briefs in Electrical and Computer Engineering</i> , 2020, , 35-45.	0.3	0