Chet T. Moritz, PhD

Curriculum Vitae

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Education

Undergraduate

1995-1998 Bachelor of Science, Zoology, University of Washington, Seattle, WA

Graduate

1999-2003 Doctor of Philosophy, Integrative Biology, University of California, Berkeley, CA

Postgraduate Training

2003-2004 Postdoctoral Fellow, Integrative Physiology, University of Colorado, Boulder, CO
2004-2008 Senior Fellow, Physiology & Biophysics, University of Washington, Seattle, WA

Faculty Positions Held

2009-2010 Research Assistant Professor, Department of Physiology & Biophysics, University of Washington, Seattle, WA
2010-2014 Assistant Professor, Rehabilitation Medicine, University of Washington, Seattle, WA
2010-2014 Assistant Professor (joint), Department of Physiology & Biophysics, University of Washington, Seattle, WA
2010-present Graduate Faculty, Neuroscience Graduate Program, University of Washington, Seattle, WA
2014-2018 Associate Professor (adjunct), Department of Electrical Engineering, University of Washington, Seattle, WA
2014-present Associate Professor (joint), Rehabilitation Medicine, University of Washington, Seattle, WA
2014-present Associate Professor (joint), Department of Physiology & Biophysics, University of Washington, Seattle, WA
2018-present Associate Professor, Electrical Engineering, University of Washington, Seattle, WA

Hospital Positions Held – N/A

Honors

1995-1998 Washington Scholar: four-year undergraduate tuition waiver
1998 Graduated *Cum Laude* from University of Washington Honors Program
2001 Outstanding Graduate Student Instructor, University of California, Berkeley
2003 American Society of Biomechanics President's Award
2008 Manuscript selected as one of top scientific advances by editors of *Nature*
2009 American Heart & Stroke Association Scientist Development Grant recipient
2009 National Institutes of Health EUREKA Award recipient
2010 Recognized at UW School of Medicine Distinguished Faculty Celebration
2012 DARPA Young Faculty Award
2013-2018 Allen Distinguished Investigator
2015- International Research Consortium on Spinal Cord Injury, Christopher & Dana Reeve Foundation

Board Certification – N/A

Current License to Practice – N/A

Professional Organizations

2002-2010 American Society of Biomechanics
2003-present Society for Neuroscience
2005-2014 American Physiological Society

Teaching Responsibilities, University of Washington, Seattle, WA

2006 PBIO 520A, Introduction to Matlab for Scientists, 1 credit (Autumn)
Responsible for course design, all lectures & grading

2009 BIOL 497B, Muscle Physiology and Movement, 3 credits (Winter)
Responsible for course design, coordination, and all lectures and exams

2010 BIOL 464, Muscle Physiology and Movement, 3 credits (Summer & Autumn)
Responsible for course design, coordination, and all lectures and exams

2010 REHAB 562: Graduate Seminar (Spring)
Present 1 guest lecture on Future Treatments for paralysis

2010-present NBIO 402, Disorders of the Nervous System, 3 credits (Annually in Winter)
Present 3 guest lectures annually (~10% of lectures)

2011 REHAB 521, Pathophysiology for Rehabilitation, 3 credits (Spring)
Present 4 lectures (all in-person lectures in this primarily online course)

2011-2,17-8 REHAB 503, Geriatrics, 3 credits (Spring)
Present 1 Guest lecture on exercise physiology and aging

2012 EE599: Graduate Seminar in Brian-computer interface (BCI) (Spring)
Present 1 guest lecture on BCIs to restore and regenerate motor function

2012-present REHAB 525, Exercise Physiology for Rehabilitation, 4 credits (each Spring)
Responsible for course design, all lectures and assessments

2012-present REHAB 562: Graduate Seminar in Neuroscience (Bi-annually in Spring)
Present 1-3 guest lectures on motor control, neuroplasticity, & neurotechnology

2014-present REHAB 520: Presentation Skills for graduate students (Bi-annually in Winter)
Present 1 guest lecture on effective presentations for research and teaching

2014-present NBIO 490: Seminar course in computational neuroscience (Bi-annually in Winter). Present one guest lecture on Brain Computer Interfaces.

2014-present BIOENG 499: Neural Engineering (Annually in Fall or Winter)
Present 1 guest lecture on neuroprosthetics to undergrad/graduate students

2015-present REHAB 558: Research Methods in Rehabilitation (Bi-annually Winter)
Present 1 guest lecture on physiology studies in rehabilitation

Trainees Mentored in Research Laboratory

Post-doctoral fellows (4)

2010-2012 Dianne Rios, PhD (co-mentor with Sarah McCoy)
2012-present Sarah Mondello, PhD (co-mentor with Phil Horner)
2014-2017 Ivana Milovanovic, PhD
2014-2017 Tom Richner, PhD (co-mentor with Adrienne Fairhall)

PhD students (7)

2011-2012 Elena Donoso-Brown (Rehabilitation Sciences, co-mentor with Sally McCoy)
2011-2014 Charlie Matlack (Electrical Engineering, co-mentor with Howard Chizeck)
2012-2017 Aiva Ievins (Neurobiology & Behavior; co-mentor with Phil Horner)
2012-2015 Torey Gilberston (Rehabilitation Sciences, co-mentor with Sally McCoy)
2014-present David Bjånes (Electrical Engineering)
2015-present Fatma Inanici, MD (Rehabilitation Sciences)
2016-present Soshi Samejima (Rehabilitation Sciences)

Medical Residents (3)

2009-2013 Alik Widge, MD PhD (Psychiatry)
2013-2106 Ryan Solinsky, MD (PM&R)
2016-2018 Josh Abecassis, MD (Neurosurgery)

Medical Students (3)

2012 Curt Lindley (UW School of Medicine)
2011-2012 Behnum Habibi (Case Western Reserve School of Medicine)
2016 Courtnie Paschall (UW MSTP)

Physical Therapy Students (10)

2010-2012 Karli Gutman (UW DPT Program)
2011-2013 Katherine Miller (UW DPT Program)
2012 Julia Selander (UW DPT Program)
2015-2016 Kyle Mark (UW DPT Program)
2017- Jonathan Abarca (UW DPT Program)
2017- Perry Hicks (UW DPT Program)
2017- Caroline Ko (UW DPT Program)
2017- Rachel Morin (UW DPT Program)
2017- Melissa Ling (UW DPT Program)
2017- Aileen Isakhavora (UW DPT Program)

Undergraduate Students (34)

2009-2012 Eric Secrist (UW Biology)
2010-2011 Peter Kim (UW Biology)
2010-2011 Ryan Miller (UW Biology)
2011-2012 Nathaniel Cook (UW Biology)
2011-2012 Anand Kaul (UW Molecular & Cell Biology)

2011-2012 Tia Secasiu (UW Molecular & Cell Biology)
2011-2012 William Wright (UW Bioengineering Capstone project)
2012 Frances Cho (Columbia Neuroscience – Summer CSNE REU)
2012 Danielle Lockwood (Arizona Bioengineering Summer CSNE REU)
2012-2017 Jan Jimenez (UW Freshman undeclared)
2012-2013 David Boe (UW Neurobiology)
2012-2015 Ryan Carlson (UW Biology)
2012-2016 Comron Ganji (UW Biology)
2012-2016 Alice Bosma-Moody (UW Bioengineering and Neurobiology)
2013 Jonathan DeShields (Morehouse Senior – Summer CSNE REU)
2013 Ebone Monk (Spellman College Junior – Summer CSNE REU)
2013-2016 Reni Magbagbeola (UW Physics/Biophysics)
2013-2014 Chloe Stiggelbout (UW Biology)
2014 Anna Johnson (UW Biology)
2014 Samuel Dreyer (Northwestern Univ. Junior – Summer CSNE REV)
2014-2016 Cooper Mellema (UW Neurobiology/Computational Neuroscience)
2014-2016 Oliver Stanley (UW Bioengineering and Neurobiology)
2015-2016 Anna Pendelton (UW Freshman – pre-major)
2016-present Annamarie Lahti (UW Freshman – pre-major)
2016-2017 Ryan Kelly (UW pre-engineering)
2016-2017 Josephine (Josie) D'Angelo (UW Neurobiology)
2016-2017 Chelsea Eduarte Nayan (UW Neurobiology)
2016-present Ben Pedigo (UW Bioengineering)
2016-present Jess Feeman (UW Bioengineering)
2017 Laura Sandoval (San Diego State University – Summer CSNE REV)
2017-present Victoria Dahl (UW Undergraduate – pre-major)
2018-present Jasmeet Khera (UW Undergraduate – Bioengineering pre-major)
2018-present Madison Bravo (UW Undergraduate – Neurobiology major)
2018-present Nick Tolley (UW Undergraduate – Neurobiology and Biochemistry major)
2018-present Sanjana Kanumuri (UW Undergraduate – pre- major)

<u>High School Students</u> (7)

2010-2011 Eliza Baird-Daniel
2014-2015 Saddie Morris
2015 Lily Orith-Smith (Summer CSNE YSP student)
2015 Lucas Fiebig (Summer CSNE YSP student)
2016 Emily Boetschen (Summer CSNE YSP student)
2016 Amanda Nguyen (Summer CSNE YSP student)
2016 Thien Nguyen (Summer CSNE YSP student)

<u>Middle and High School Teachers</u> (4)

2015 Alison Farrell (Summer CSNE Research Experience for Teachers - RET)
2015 Benjamin Hart (Summer CSNE Research Experience for Teachers - RET)

2017	Adam King (Summer CSNE Research Experience for Teachers - RET)
2017	Laura Moore (Summer CSNE Research Experience for Teachers - RET)

Editorial Responsibilities

2009-present	Review Editor; Frontiers in Neuroprosthetics journal
2013-present	Associate Editor, Brain-Computer Interfaces Journal

Special National Responsibilities

Center Leadership

2011-2013	Testbed Leader, NSF ERC in Sensorimotor Neural Engineering. University of Washington, Seattle, WA
2014-2017	Deputy Director, NSF ERC in Sensorimotor Neural Engineering. University of Washington, Seattle, WA
2017-2018	Co-Director, NSF ERC in Sensorimotor Neural Engineering. University of Washington, Seattle, WA
2018-present	Co-Director, NSF ERC in Neurotechnology. University of Washington, Seattle, WA
2017	Innovation Theme Leader, Cleveland Neural Engineering Workshop (ClevelandNEW), Cleveland, OH

Grant reviewer

2009-2010	NIH study section ad-hoc member: ZRG1-F02B Sensory, Motor & Cognitive Neuroscience Fellowship Section
2011	NIH study section: ZHD1 DSR-K 52 Controller Development for Upper Limb Movement
2010	US-Israel Bi-national Science Foundation
2010-2017	Wings for Life – Spinal Cord Research Foundation
2012	NSF Division of Information and Intelligent Systems, Ad hoc reviewer
2013	NIH/NIBIB study section ad-hoc member: ZEB1 OSR-E(01) K-Award panel
2013	NIH/NINDS EUREKA Review panel: ZNS1 SRB N(04)
2014	NIH/NIBIB Training grant study section: ZEB1 OSR-F (J1) S R25-T32 panel
2015	NSF EPSCoR Track-2 (RII Track-2 FEC) Ad hoc reviewer
2015	Craig H. Neilsen Foundation SCIRTS LOI review panel
2015	NSF Science and Technology Center (STC) site visit panel chair
2015	DOD/CDMRP Peer Reviewed Medical Research program (PRMRP) Clinical Trial Award
2017	UC Irvine's Institute for Clinical and Translational Science grant review panel
2017	Dept. of Veterans Affairs, Rehabilitation Research & Development service Small Projects in Rehabilitation (SPiRE) Research program
2017	Paralyzed Veterans of America (PVA) Clinical Grant Review Panel
2017	Hong Kong Research Grants Council Reviewer

Conference Organization

2014	Co-organizer: New Perspectives on Neuroengineering and Neurotechnologies. NSF-DFG (German National Science Foundation) conference at NSF headquarters in Washington, DC (Nov 2014)

Referee (34 Journals 2004-present)

Nature
Nature Neuroscience
Nature Communications
Nature Reviews Neuroscience
Journal of Neuroscience
Journal of Neurotrauma
Journal of Neurophysiology
Journal of Applied Physiology
Journal of Neural Engineering
Journal of Sports Sciences
Journal of Experimental Biology
Journal of Applied Biomechanics
Journal of Neuroscience Methods
Journal of Computational Neuroscience
Journal of Neural Engineering & Rehab
Annals of Biomedical Engineering
Neuron
Sensors
Neural Networks
Behavioural Brain Research
Neuroscience Letters
Symmetry
PLoS Biology
Gait and Posture
Experimental Neurology
Human Movement Science
Frontiers in Neuroprosthetics
Bioinspiration & Biomimetics
Somatosensory and Motor Research
Exercise and Sports Science Reviews
European Journal of Applied Physiology
IEEE Transactions on Biomedical Engineering
IEEE Transactions on Biomedical Circuits & Systems
IEEE Transactions on Neural Systems & Rehabilitation Engineering
Biomedical Engineering/Biomedizinische Technik

Special Local Responsibilities

2005	Postdoctoral co-organizer: Howard Hughes Medical Institute Future Faculty workshop, University of Washington, Seattle, WA
2005-2008	Post-doctoral representative to Faculty, Physiology & Biophysics University of Washington, Seattle, WA
2008-present	K-12 science outreach: Future of Neurotechnology – Snohomish School District and University Child Development School University of Washington, Seattle, WA
2010-present	Ad-Hoc Reviewer for the UW Royalty Research Fund University of Washington, Seattle, WA
2013	Research featured at Seattle Science Center *Minds & Machines* exhibit
2014	Play *Calibration* on our research presented by Infinity Box Theater after extensive interaction with playright Elizabeth Hefron
2014-present	Grant Reviewer, Sackler Scholars in Biophysics program; University of Washington, Seattle, WA
2014-present	Executive committee co-chair and grant reviewer, UW Institute for Neural Engineering (UWIN); University of Washington, Seattle, WA
2014-present	Chair of Walter C. and Anita C. Stolov Research Fund review committee. Dept. of Rehabilitation Medicine, University of Washington, Seattle, WA
2016-present	Co-organizer: Future Faculty Fellows Postdoctoral Career Development Workshop, University of Washington School of Medicine, Seattle, WA. Annual workshop with 70-90 postdocs and 26 faculty presenters

2017-present Director, Washington State Spinal Cord Injury Consortium (WASCIC), University of Washington, Seattle, WA

2018-present Member, Department of Rehabilitation Diversity Council (DRRC), University of Washington, Seattle, WA

Research Funding

Current Funding

2011-2021 Co-Director and Co-PI (8% time) Center for Neurotechnology (CNT). National Science Foundation Engineering Research Center EEC-1028725. Rao (PI). $4M/year total costs.

2011-2020 PI (5% time) NeuroGame Therapy to improve hand function following stroke. Bayley Family Stroke Care Fund in Rehabilitation Medicine. $139,181.

2013-2018 Lead-PI (8% time). A brain-computer interface to re-animate the limbs following spinal injury: development of a Brain-Computer-Spinal Interface (BCSI). Paul G. Allen Family Foundation. Co-PIs Smith and Fairhall. $500,000/year total costs.

2015-2018 PI (15% time). International Research Consortium on Spinal Cord Injury. Christopher and Dana Reeve Foundation. $200,000/year total costs.

2016-2018 Co-PI (5% time). Towards deep brain monitoring with superficial EEG sensors plus neuromodulatory focused ultrasound. NIH/National Eye Institute R21 1R21EY027557-01. PIs Mourad, Rao and Moritz. $231,813/year total costs.

2017-2019 Co-PI (2% time). Optogenetic integration of grafted neural stem cells. Craig H. Neilsen Foundation Pilot Grant (# pending). PI: Phil Horner. $75,000/year total costs.

2017-2019 PI (8% time). Transcutaneous spinal stimulation to improve hand & arm function for people with chronic cervical spinal cord injury. Washington State Spinal Cord Injury Consortium (WASCIC). $97,000/year total costs

2017-2019 Co-PI (0% time). Spinal stimulation for standing & walking; comparison of transcutaneous & epidural stimulation. Washington State Spinal Cord Injury Consortium (WASCIC). PI: Rajiv Saigal. $100,000/year total costs.

Current grants to support laboratory trainees

2016-2018 PI. Activity Dependent Rehabilitation with Electrical Spinal Stimulation (ADDRESS). Center for Sensorimotor Neural Engineering (CSNE). CSNE-2013-6. Fatma Inanici (Rehabilitation Sciences Graduate Trainees). $50,387/year.

2016-2018 PI. Artificial feedback for sensory restoration. Center for Sensorimotor Neural Engineering (CSNE) and UWIN. Bjanes (Graduate Trainee). $50,387/year.

2017-2018 PI. Measuring spinal neurotransmitter levels to determine mechanisms of epidural stimulation. Center for Sensorimotor Neural Engineering (CSNE). Thongpang (Visiting Scientist/Postdoctoral Trainee). $30,000/year.

2017-2019 Transcutaneous Spinal Stimulation with Intensive Physical Therapy for Locomotion. University of Washington Institute for Neuroengineering (UWIN) and

Center for Sensorimotor Neural Engineering (CSNE). Soshi Samejima (Rehabilitation Sciences Graduate Student), $30,000/year stipend + tuition.

Past Funding

2009-2014 PI (20% time) Combined stem cell transplantation and targeted microstimulation to direct the formation of functional connections and neural repair. NIH/NINDS EUREKA R01 1R01NS066357. Moritz & Horner (multi-PI). $200,000/year, Moritz Share $100,000/year. No-cost extension to 7/2014.

2009-2010 PI (16% time) Reconnecting the brain and spinal cord after injury via an autonomous electronic device. Univ. of Washington Royalty Research Fund # 4471. Moritz (PI). $38,339.

2009-2010 PI (5% time) Rehabilitation gaming for improvement of neurological function & compliance with movement practice. Pacific Northwest Center for Neural Engineering. Moritz, McCoy, Flick (multi-PI). $5,500.

2009-2010 PI (5% time) Neural control of a robotic finger: individual muscles vs. endpoint control. Pacific Northwest Center for Neural Engineering. Moritz & Matsuoka (multi-PI). $4,980.

2009-2010 Co-PI (2% time) Lower level feedback enhances brain computer: interface control of robots for grasping tasks. Pacific Northwest Center for Neural Engineering. Chizeck, Moritz, Smith (multi-PI). $10,000.

2009-2013 PI (20% time) Restoring movement following stroke: training spared cortical areas to control paralyzed muscles. American Heart & Stroke Association, NCRP Scientist Development Grant 09SDG2230091. Moritz (PI). $70,000/year.

2010-2011 PI (25% time). Administrative Supplement. NIH/NINDS EUREKA R01 1R01NS066357. Moritz (PI). $50,000.

2010-2011 Co-PI (10% time), Rehabilitation gaming using wireless electromyography. Commercialization Gap Fund. University of Washington Center for Commercialization and Washington Research Foundation. Otis, Moritz & McCoy (multi-PI). $44,275.

2011-2012 Co-PI (1% time). Rehabilitation gaming and upper extremity recovery after stroke: a pilot study. ITHS Washington Small Grant. McCoy, Moritz, Otis (co-PI). $10,000.

2011-2013 Mentor (1% time). Closed Loop Neurostimulation for Psychiatric Disorders. Center for Sensorimotor Neural Engineering (CNSE) seed funding. CSNE-2011-6. Widge (Medical Resident Trainee). $5,560/year.

2011-2013 Co-Investigator (1% time). Low Power Wireless Stimulation Chips for BCIs. Center for Sensorimotor Neural Engineering (CNSE) seed funding. CSNE-2011-6. Otis (PI). $47,100/year.

2011-2013 Co-mentor (1% time). Optimizing BMI Design for Brain Adaptation. Center for Sensorimotor Neural Engineering (CNSE) seed funding. CSNE-2011-6. Matlack (Graduate Trainee). $47,344/year.

2012-2013 PI (4% time) Automated NeuroGame Therapy after brain injury. Washington Research Foundation $48,279.

2012-2013 Co-PI (1% time) Information coding and learning in brain-to-brain communication. UW Royalty Research Fund. Rao (PI) $23,412.

2012-2014 Mentor (2% time) Light-activated interneuron transplants for targeted repair of the central nervous system. Sackler Scholars in Biophysics Postdoctoral Fellowship. $50,000/year.

2012-2014 PI (15% time) A Brain-Machine-Spinal Interface (BMSI) to replace and repair the injured nervous system. DARPA Young Faculty Award, D12AP00251. $100,000/year.

2013-2015 PI (15% time) Synchronous stimulation and ChABC therapy to restore function after SCI. Neilsen Foundation Pilot Grant (#259314). $150,000/year total costs.

2015 Lead PI (8% time). BIONIC: Bi-directional Optical Nerve Interface for Continence. GlaxoSmithKlein (GSK) Bioelectronic Medicine Fund. Co-PIs Smith, Brunton, Horwitz & Anikeeva. $200,000/6 months total costs.

2015-2017 Subcontract-PI (15% time) Plasticity and Activation of Spared Intraspinal Respiratory Circuits Following Spinal Cord Injury. DOD CDMRP SCIRP SC120209 (Reier, PI). UW Subcontract $129,597/year total costs

2016-2018 Lead-PI (15% time) BIONIC: Bi-directional Optical Nerve Interface for Continence. GlaxoSmithKlein (GSK) Bioelectronic Medicine Fund Phase II. Co-PIs Smith, Brunton, Horwitz, Fawcett, Donaldson & Anikeeva. $1M/year total costs.

Past grants to support laboratory trainees

2013-2016 PI. A Brain-Machine-Spinal Interface (BMSI) to reanimate & rehabilitate the injured nervous system. Center for Sensorimotor Neural Engineering (CNSE). CSNE-2013-6. Ievins & Inanici (Graduate Trainees). $50,387/year.

2014-2016 PI. Artificial feedback for sensory restoration. Center for Sensorimotor Neural Engineering (CNSE) and UWIN. Bjanes (Graduate Trainee). $50,387/year.

2014-2016 Mentor. Light-activated interneuron transplants for targeted repair after SCI. Neilsen Foundation Postdoctoral Fellowship to Sarah Mondello. $82,500/year total costs.

Past Training Grants

2002-2003 American Society of Biomechanics Graduate Student Grant-in-aid $1,500.

2005-2008 PI (100% time) Cortical signals restore functional muscle activation. NIH NINDS Ruth L. Kirschstein NRSA Individual Postdoctoral Fellowship F32NS5101 Moritz PI. $149,772 total direct costs.

Bibliography

Peer-Reviewed Publications

1. Moritz, C.T. & Farley, C.T. (2003) Human hopping on damped surfaces: strategies for adjusting leg mechanics. *Proceedings of the Royal Society of London, Series B*, 270, 1741-1746.

2. Moritz, C.T. & Farley, C.T. (2004) Passive dynamics change leg mechanics for an unexpected surface during human hopping. *Journal of Applied Physiology,* 97 (4), 1313-1322.

3. Moritz, C.T., Greene, S.M., & Farley, C. T. (2004) Neuromuscular changes for hopping on a range of damped surfaces. *Journal of Applied Physiology,* 96 (5), 1996-2004.

4. Moritz, C.T. & Farley, C.T. (2005) Human hopping on very soft surfaces: implications for muscle pre-stretch and elastic energy storage in locomotion. *Journal of Experimental Biology,* 208, 939-949.

5. Shinohara, M., Moritz, C.T., Pascoe, M.A., Enoka, R.M. (2005) Prolonged vibration increases stretch reflex amplitude, motor unit discharge rate, and force fluctuations in a hand muscle. *Journal of Applied Physiology* 99(5), 1835-1842.

6. Moritz, C.T., Christou, E.A., Meyer, F.G., Enoka, R.M. (2005) Coherence at 16-32 Hz can be caused by short-term synchrony of motor units. *Journal of Neurophysiology,* 94 (1), 105-118.

7. Moritz, C.T., Barry, B. K., Pascoe, M.A., Enoka, R.M. (2005) Discharge rate variability influences the variation in force fluctuations across the working range of a hand muscle. *Journal of Neurophysiology,* 93 (5), 2449-2459.

8. Moritz, C.T. & Farley, C.T. (2006) Human hoppers compensate for simultaneous changes in surface compression and energy dissipation on heavily damped surfaces. *Journal of Biomechanics*, 39(6), 1030-1038.

9. Jackson, A., Moritz, C.T., Mavoori, J., Lucas, T.H., Fetz, E.E. (2006) The Neurochip BCI: towards a neural prosthesis for upper limb function. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 14(2), 187-190.

10. Moritz, C.T., Lucas, T.H., Perlmutter, S.I., Fetz, E.E. (2007) Forelimb movements and muscle responses evoked by microstimulation of cervical spinal cord in sedated monkeys. *Journal of Neurophysiology,* 97(1), 110-120.

11. Moritz, C.T., Perlmutter, S.I., Fetz, E.E. (2008) Direct control of paralyzed muscles by cortical neurons. *Nature,* 456, 639-642.

12. van der Krogt, M.M., de Graaf, W.W., Farley, C.T., Moritz, C.T., Casius, R.L.J., Bobbert, M.F. (2009) Robust passive dynamics of the musculoskeletal system compensate for unexpected surface changes in human hopping. *Journal of Applied Physiology* 107(3), 801-808.

13. Otis, B., Moritz, C., Holleman, J., Mishra, A., Pandey, J., Rai S., Yeager, D., Zhang, F. (2009) Circuit Techniques for Wireless Brain Interfaces. *IEEE Engineering in Medicine and Biology Society*, 2009:3213-6. PMID: 19964058.

14. Moritz, C.T. & Fetz, E.E. (2011) Volitional control of single cortical neurons in a brain-machine interface. *Journal of Neural Engineering*. 8 (2011) 025017.

15. Moritz, C., Morrison, T., Otis, B., Burt, J., Rios, D., Gilbertson, T., McCoy, S. (2011) 'Neurogame therapy' for improvement of movement coordination after brain injury: Developing a wireless biosignal game therapy system. *Proceedings of the IEEE Global Humanitarian Technology Conference*, Seattle, WA.

16. Matlack, C., Moritz, C., Chizeck, H. (2012) Applying Best Practices from Digital Control Systems to BMI Implementation. *IEEE Engineering in Medicine and Biology Society*. 2012:1699-702. PMID: 23366236

17. Sunshine M.D., Cho, F.S., Lockwood D.F., Fechko A.S., Kasten M.R., Moritz C.T. (2013) Cervical intraspinal microstimulation evokes robust forelimb movements before and after injury. *Journal of Neural Engineering* 10 036001. PMCID: PMC3732065.

18. Rios, D.C., Gilbertson, T., McCoy, S.W., Price, R., Gutman, K.F., Miller, K.E.F., Fechko, A., Moritz, C.T. (2013) NeuroGame Therapy to improve wrist control in children with cerebral palsy: A case series. *Developmental Neurorehabilitation.* 16(6):398-409.

19. Kasten M.R., Sunshine M.D., Secrist E., Horner P.J., Moritz C.T. (2013) Therapeutic intraspinal stimulation improves forelimb function after cervical contusion injury. *Journal of Neural Engineering.* 10 044001. PMCID: PMC3748939

20. Nutt, S.E., Chang, E.A., Suhr, S.T., Schlosser, L.O., Mondello, S.E., Moritz, C.T., Cibelli, J. B., Horner, P.J. (2013) Caudalized human iPSC-derived neural progenitor cells produce neurons and glia but fail to restore function in an early chronic spinal cord injury model. *Experimental Neurology* 248:491-503. PMCID: PMC4109283.

21. Haddock, A., Matlack, C., Moritz, C., Chizeck, H. (2013) An Optimal Control Analysis of Motor Strategies in a Brain-Computer Interface Task. *6th International IEEE EMBS Conference on Neural Engineering.*

22. Mehic, E., Xu, J.M., Caler, C.J., Coulson, N.K., Moritz, C.T., Mourad, P.D. (2014) Increased Anatomical Specificity of Neuromodulation via (Modulated) Focused Ultrasound. *PLoS One.* DOI: 10.1371/journal.pone.0086939 PMID: 24504255 PMCID: PMC3913583

23. Mondello, S.E., Kasten, M.R., Horner, P.J., Moritz, C.T. (2014) Therapeutic intraspinal stimulation to generate activity and promote long-term recovery. *Frontiers in Neuroprosthetics* 8:21. doi: 10.3389/fnins.2014.00021. PMCID: PMC3936503.

24. Donoso Brown, E.V., Westcott McCoy, S., Fechko, A.S., Price, R., Gilbertson, T., Moritz, C.T. (2014) Preliminary Investigation of an Electromyography-controlled Video Game as a Home Program for Persons in the Chronic Phase of Stroke Recovery. Archives of Physical Medicine and Rehabilitation 95(8): p. 1461-9. PMID: 24657112, PMCID: Journal - In Process.

25. Widge, A., Moritz, C.T. (2014) Pre-frontal control of closed-loop limbic neuromodulation by rodents using a brain-computer interface. *Journal of Neural Engineering* 11(2):024001. Doi:10.1088/1741-2560/11/2/024001. PMID: 24608127. PMC Journal – In Process.

26. Widge, A., Daugherty, D.D., Moritz, C.T. (2014) Affective brain-computer interfaces as enabling technology for responsive psychiatric stimulation. *Journal of Brain Computer Interfaces.*1(2) 126-136.

27. Matlack, C., Haddock, A., Moritz, C., Chizeck, H. (2014) Motor Cortical Decoding Performance Depends on Controlled System Order. *IEEE Engineering in Medicine and Biology Society*.

28. Mondello, S.E., Sunshine, M.D., Fischedick A.E., Moritz, C.T., Horner, P.J. (2015) A cervical hemi-contusion spinal cord injury model for the investigation of novel therapeutics targeting proximal and distal forelimb functional recovery. *Journal of Neurotrauma*. 32 (24): 1994-2007. Cover Image: (http://online.liebertpub.com/action/showLargeCover?issue=40357403) http://online.liebertpub.com/doi/10.1089/neu.2014.3792

29. Milovanovic, I., Robinson, R., Fetz, E.E., Moritz, C.T. (2015) Simultaneous and independent control of a brain-computer interface and contralateral limb movement. *Brain Computer Interfaces.* Volume 2, issue 4. 174-185. PMID: 27148554. PMCID: PMC4852883. Online: http://www.tandfonline.com/doi/full/10.1080/2326263X.2015.1080961

30. Donoso Brown, E., Gutman, K.., Moritz, C., Westcott McCoy, S. (2015) Understanding Upper Extremity Home Programs and the use of Gaming Technology for Persons After Stroke. *Disability and Health*. 8(4) p. 507-513. PMID: 25953349 PMCID: PMC4570873.

31. Moritz, C.T., Ruther, P., Goering, S., Stett, A., Ball, T.,Burgard, W., Chudler, E., Rao, R., (2016) New Perspectives on Neuroengineering and Neurotechnologies: NSF-DFG Workshop Report. IEEE Transactions on Biomedical Engineering. 63 (7) p. 1354-1367 DOI 10.1109/ TBME.2016.2543662. PubMed PMID: 27008657. Online at: http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7435275

32. Ranganathan, V., Mahoney, B., Pepin, E., Sunshine, M., Moritz, C., Rudell, J., Smith, J. (2016) A High-Voltage Compliant Neural Stimulator With HF Wireless Power and UHF Backscatter Communication. IEEE Wireless Power Transfer Conference (WPTC).

33. Matlack C., Chizeck, H.J., and Moritz, C.T., (2017) Empirical Movement Models for Brain-Computer Interfaces" *IEEE Trans on Neural Systems and Rehabilitation Engineering.* 25 (6): 694-703 Digital Object Identifier: 10.1109/TNSRE.2016.2584101. http://ieeexplore.ieee.org/document/7502071/?arnumber=7502071&source=authoralert PMID: 27390179

34. Moritz, C.T., Ambrosio, F. (2017) Regenerative Rehabilitation: combining stem cell therapies and activity dependent stimulation. *Pediatric Physical Therapy*. 29:S10-S15. http://journals.lww.com/pedpt/Abstract/2017/07001/Regenerative_Rehabilitation___Combining_Stem_Cell.3.aspx PMID: 28654473 PMCID: PMC5488706

35. Lu, C., Park, S., Richner, T., Derry, A., Brown, I., Hou, C., Rao, S., Kang, J., Moritz, C.T. Fink, Y., and Anikeeva P. (2017) Flexible and Stretchable Nanowire Coated Fibers for Optoelectronic Probing Spinal Cord Circuits. *Science Advances.* 29;3(3):e1600955 PubMed PMID: 28435858; PMCID: PMC5371423. DOI:10.1126/sciadv.1600955.

36. Ievins, A., Moritz, C.T. (2017) Therapeutic stimulation for restoration of function after spinal cord injury. *Physiology* Invited Review. 16 August Vol. 32 no. 5, 391-398 DOI: 10.1152/physiol.00010.2017. http://physiologyonline.physiology.org/content/32/5/391. PMID: 28814499.

37. Bjanes, D.A. & Moritz, C.T. (2018) Automated Center-out Rodent Behavioral Trainer (ACRoBaT), a fully automated device for training rats to perform a center out task. .*Behavioural Brain Research*. 356: 115-121: https://doi.org/10.1016/j.bbr.2017.11.031. PMID: 29196193.

38. Sunshine, M.D., Ganji, C.N., Reier, P.J., Fuller, D.D., Moritz, C.T. (2018) Intraspinal microstimulation for respiratory muscle activation. *Experimental Neurology* 302:93-103. DOI: 10.1016/j.expneurol.2017.12.014. PMID: 29305050. PMCID: PMC5849524.

39. Goshi, N.,Castagnola, E., Vomero, M., Gueli, C., Cea, C., Zucchini, E., Bjanes, D., Maggiolini, E., Moritz, C., Kassegne, S., Ricci, D., Fadiga, L. (2018) Glassy Carbon MEMS for Novel Origami-Styled 3D Integrated Intracortical and Epicortical Neural Probes. In Press: *Journal of Micromechanics and Microengineering*. JMM-103408. http://iopscience.iop.org/article/10.1088/1361-6439/aab061/meta.

40. Nimbalkara, S., Castagnola, E., Balasubramania, A., Scarpellini, A., Samejima, S., Khorasani, A., Boissenin, A., Thongpang, S., Moritz, C., and Kassegne, S., (2018) Ultra-Capacitive Carbon Neural Probe Allows Simultaneous Long-Term Electrical Stimulations and High-Resolution Neurotransmitter Detection*, Nature Scientific Reports* (8) 6958. PMID: 29725133 PMCID: PMC5934383. Direct link: https://rdcu.be/NhPY.

41. Mondello, S.E., Sunshine M.D., Fischedick A.E., Dreyer S., Horwitz, G.D., Anikeeva, P., Horner P.J. Moritz C.T. (2018) Optogenetic surface stimulation of the rat cervical spinal cord. *Journal of Neurophysiology*. https://doi.org/10.1152/jn.00461.2017. PMID: 29718809. PMCID: Pending – epub ahead of print.

42. Inanici, F., Samejima, S., Gad, P., Edgerton, V.R., Hofstetter, C., Moritz, C.T. (2018) Transcutaneous electrical spinal stimulation promotes long-term recovery of upper extremity functions in chronic tetraplegia: a case study. *IEEE Transactions on Neural Systems and Rehabilitation Engineering (TNSRE).* 26(6) 1272-1278. *https://doi.org/*10.1109/TNSRE.2018.2834339. PMID: 29877852

43. Moritz, C.T. (2018) Now is the critical time for Engineered Neuroplasticity. Invited Perspective for special issue on Spinal Cord injury. *Neurotherapeutics*. DOI: 10.1007/s13311-018-0637-0. PMID: 29948920. Open Access download: http://link.springer.com/article/10.1007/s13311-018-0637-0

Book Chapters

1. Widge, A. S., Moritz, C. T., Matsuoka, Y. (2010) Direct Neural Control of Anatomically Correct Robotic Hands. Pages 105-119 In: (*B+H)CI: The Human in Brain-Computer Interfaces and the Brain in Human-Computer Interaction*. Editors: Tan DS, Nijholt A. Springer, New York.

2. Widge, A. S., Moritz, C. T. (2016) Closed-Loop Stimulation in Emotional Circuits for Neuro-Psychiatric Disorders In: *Closed Loop Neuroscience*, edited by Ahmed El-Hady, Elsevier. Pages 229-239.

Other publications

1. Moritz, C.T. (2009) A spring in your step: some is good, more is not always better. *Journal of Applied Physiology* 107(3), 643-4. (Invited Editorial)

2. Kasten, M.R., Ievins, A.M., Moritz, C.T. (2015) Neural Prostheses. *Invited review for eLS*: John Wiley & Sons, Ltd: Chichester DOI: 10.1002/9780470015902.a0024011

Patents and Patent applications

1. HYBRID SYSTEM FOR TREATING MENTAL AND EMOTIONAL DISORDERS WITH RESPONSIVE BRAIN STIMULATION United States application number 15/305,752. Co-inventors Widge, A., and Moritz, C.T. Filed October 21, 2016.

Manuscripts Submitted

1. Gilbertson, T, Bjornson, K, Hafner B, McCoy SW, Moritz C. NeuroGame Therapy for Enhancing Ankle Dorsiflexion in Children with Cerebral Palsy. Under Revisions, *Physical Therapy Journal*

Manuscripts in Preparation

1. Matlack, C., Moritz, C.T., Chizeck, H.J. "Control Strategies Employed During BMI-mediated Tasks" to be submitted to *IEEE Trans on Neural Systems and Rehabilitation Engineering.*

2. Lansdell B., Milovanovic I., Mellema C., Fetz E. E., Fairhall A. L., Moritz C.T. Reconfiguring motor circuits for a joint manual and BCI task. Under revision following submission to *PLoS Computational Biology*.

3. Milovanovic, I. P., Boeschoten, E. M., Moritz, C.T. Optimizing Proprioceptive Feedback through Novel Haptic Devices. Under revision following submission to *Haptics Symposium.*
4. Bjanes, D.A. & Moritz, C.T. Perception of artificial sensory feedback via cortical stimulation – the beat goes on. In preparation for submission to *IEEE Transactions on Neural Systems and Rehabilitation Engineering (TNSRE).*

Peer Reviewed Conference Proceedings not available online

1. Widge, A., Habibi, B., Moritz, C. (2013) Pilot study of cortical recording with synchronized limbic stimulation. *6th International IEEE EMBS Conference on Neural Engineering.*

2. Kasten M.R., Sunshine M.D., Moritz C.T. (2012). Cervical intraspinal microstimulation improves forelimb motor recovery after spinal contusion injury. International Functional Electrical Stimulation Society (iFESS).

Published Abstracts

1. Moritz, C.T., Tu, M.S, Daniel, T.L. (1998) Temperature gradients in *Manduca* flight muscle mediate spatial gradients in force generation. American Zoologist. 35(5): 82A.

2. Moritz, C.T., Greene, S.M., & Farley, C.T. (2002) Neuromuscular adjustments for hopping on a heavily damped surface. IV World Congress of Biomechanics. Calgary.

3. Moritz, C.T. & Farley, C.T. (2003) Human hopping on very soft surfaces. American Society of Biomechanics. Toledo, OH.

4. Moritz, C.T. & Farley, C.T. (2003) Humans anticipate surface changes during bouncing gaits. American Society of Biomechanics. Toledo, OH.

5. Moritz, C.T. & Farley, C.T. (2003) Neuromechanical anticipation and reaction during human locomotion. Society for Neuroscience, New Orleans, LA.

6. Shinohara, M., Moritz, C.T., Frigon, A., Enoka, R.M. (2004) Vibration - induced enhancement of the stretch reflex is accompanied by an increase in the force fluctuations for a hand muscle. Society for Neuroscience, San Diego, CA.

7. Moritz, C.T., Christou, E.A., Meyer, F.G., Enoka, R.M. (2004) Time- and frequency-domain measures of motor unit synchronization. Society for Neuroscience, San Diego, CA.

8. Christou, E.A., Rudroff, T., Moritz, C.T., Enoka, R.M. (2004) The variability in motor unit discharge is determined by low - frequency oscillations in discharge rate. Society for Neuroscience, San Diego, CA.

9. Moritz, C.T., Barry, B.K., Pascoe, M.A., Enoka, R.M. (2005) Discharge rate variability is responsible for the variation in force fluctuations across the working range of a hand muscle. International Union of Physiological Sciences, San Diego, CA.

10. Moritz, C.T., Lucas, T.H., Perlmutter, S.I., Fetz, E.E. (2005) Output effects evoked by microstimulation of cervical spinal cord in sedated monkeys – implications for neuroprosthetic applications. Brain-Computer Interface Technology, Rensselaerville, NY

11. Lucas, T.H., Moritz, C.T., Perlmutter, S.I., Fetz, E.E. (2005) Forelimb movements and muscle responses evoked by microstimulation of cervical spinal cord in sedated monkeys. Society for Neuroscience, Washington DC.

12. Moritz, C.T., Zanos, S., Perlmutter, S.I., Fetz, E.E. (2006) Operant conditioning of pre- and post-central unit activity in forelimb area of monkey using biofeedback of discharge rate. Society for Neuroscience, Atlanta GA.

13. Moritz, C.T., McElwain, K.L., Perlmutter, S.I., Fetz, E.E. (2007) Monkeys use cortical activity to control electrical stimulation of paralyzed muscles. Society for Neuroscience, San Diego CA.

14. Moritz, C.T., Perlmutter, S.I., Fetz, E.E. (2008) Monkeys use cortical activity to control functional electrical stimulation of paralyzed muscles. Society for Neuroscience, Washington DC.

15. Zanos, S., Richardson, A., Shupe, L., Moritz, C., Nishimura Y., Miles, F., Perlmutter, S., Fetz, E. (2009) The Neurochip-2: An implantable system for recording neural and behavioral signals and delivering electrical stimuli in freely behaving monkeys. Society for Neuroscience, Chicago IL.

16. Fetz, E., Jackson, A., Moritz, C., Nishimura, Y., Lucas, T., Perlmutter, S. (2010) Learning and plasticity in neural populations with recurrent brain-computer interfaces. AREADNE - Research in Encoding And Decoding of Neural Ensembles. Santorini, Greece.

17. Fetz, E.E., Perlmutter, S., Moritz, C.T. Nishimura, Y., Zanos, S., Richardson, A. Lucas, T., Eaton, R. (2010) Applications of recurrent brain-computer interfaces. Fourth International Brain-Computer Interface Meeting, Asilomar, CA.

18. Moritz, C.T. & Fetz, E.E. (2010). Volitional control of cortical neurons. Fourth International Brain-Computer Interface Meeting, Asilomar, CA.

19. McCoy S., Lubetzsky-Vilnai A., Moritz C. (2011). Exploration of technology use for enjoyable task-specific practice to improve selective volitional muscle activation in children with cerebral palsy. World Physical Therapy, Amsterdam, Netherlands.

20. Gilbertson, T., Rios, D., Donoso Brown, E., Price, R., McCoy, S., Moritz, C. (2011) 'Neurogame' Therapy for Upper Extremity Function in Children with Cerebral Palsy. American Physical Therapy Association Combined Sections Meeting (APTA-CSM), Chicago, IL.

21. Widge A.S., Fetz E., Moritz C.T. Preliminary Validation of Closed-Loop Neurostimulation in Rat Models of Psychiatric Illness. (2011) American Psychiatric Association Meeting, Honolulu, HI, May 14-18, 2011.

22. Moritz, C.T. (2011) Neuroprosthetic approaches to the treatment of spinal cord injury in *International Spinal Research Trust Network Meeting*. London, UK.

23. Moritz, C.T. (2011) Leveraging neural plasticity for the treatment of paralysis and other movement disorders in *International Symposium on Neural Regeneration*. Asilomar, CA.

24. Widge AS, Moritz CT. (2012) Operant conditioning of frontal-limbic pathways in rodents: First steps towards a closed-loop psychiatric neural prosthesis. In 2012 Society of Biological Psychiatry Meeting, Philadelphia, PA, May 2-6, 2012. (Best Poster Award Finalist)

25. Widge A.S., Moritz C.T. (2012) Operant conditioning of frontal-limbic pathways in rodents: first steps towards a closed-loop psychiatric neural prosthesis. In 2012 American Psychiatric Association Meeting, Philadelphia, PA, May 6-10, 2012.

26. Miller, K., Donoso Brown, E., Westcott McCoy, S., Gilbertson, T., Price, R., Gutman, K.; Moritz, Chet (2012). Neurogame Therapy for upper extremity function in adults with stroke and traumatic brain injury. Combined Sections Meeting (CSM) of the American Physical Therapy Association (APTA), San Diego, CA, January 2012.

27. Gutman, K., Donoso Brown, E., Moritz, C., Rios, D., Gilbertson, T., Miller, K., Price, R., Westcott McCoy, S. (2012). Differences in motor coordination between adults post stroke with or without sensory loss. Combined Sections Meeting (CSM) of the American Physical Therapy Association (APTA), San Diego, CA, January 2012.

28. Matlack, C., Chizeck, H. Moritz, C. (2013) Correctly Applying Performance Metrics to Neuroprosthetic Control Interfaces. 5th International Brain-Computer Interface Meeting. Asilomar, CA, June 2013.

29. Widge A.S., Moritz C.T. (2013) Rodent Proof of Concept for a Patient-Controllable Brain Stimulator (Closed-Loop Limbic Prosthesis). In 2013 Society of Biological Psychiatry Meeting, San Francisco, CA, May 16-18, 2013.

30. Gilbertson, T., Prange, H., Orr, O., Price, R., Moritz, C., McCoy, S. (2014) NeuroGame Therapy for Ankle Dorsiflexion Control in Children with Cerebral Palsy. APTA Combined Sections Meeting, Las Vegas, NV, February 3-6, 2014.

31. Ievins, A., Sunshine, M., Bosma-Moody, A., Carlson, R., Moritz, C. (2014) A Brain-Controlled Spinal Interface (BCSI) for reanimation of paralyzed limbs after spinal cord injury. IEEE EMBS Brain Grand Challenges Workshop, Washington DC November 13-14, 2014.

32. Ievins, A., Sunshine, M., Bosma-Moody, A., Carlson, R., Moritz, C. (2014) A Brain-Controlled Spinal Interface (BCSI) for reanimation of paralyzed limbs after spinal cord injury. Society for Neuroscience Annual Meeting, Washington DC November 15-19, 2014.

33. Mondello, S.E., Sunshine, M.D., Horner, P.J., Moritz C.T. (2014) Optogenetic mapping of forelimb movement in the rat cervical spinal cord. Society for Neuroscience Annual Meeting, Washington DC November 15-19, 2014.

34. Mondello SE, Sunshine MD, Dreyer S, Horner PJ, Moritz CT (2015). A microLED implant for long-term optogenetic stimulation of the rat spinal cord. International Symposium on Neural Regeneration (ISNR), Asilomar, CA Nov 30-Dec 4 2015.
35. Ievins, A., Sunshine, M., Fischedick, A., Bosma-Moody, A., Carlson, R., Moritz C (2015). Brain-Machine Spinal Interface and ChABC Treatments for the Reanimation and Rehabilitation of the Injured Nervous System. International Symposium on Neural Regeneration (ISNR), Asilomar, CA Nov 30-Dec 4 2015.
36. Solinsky, R., Sunshine, M., Mondello, S., Richner, T., Moritz, C. (2015) Neuroprostheses Use in the Management of Neurogenic Bladder. Academy of Spinal Cord Injury Professionals Educational Conference. New Orleans, LA, September 6-9, 2015.
37. Pradham, S., Moritz, C.T. (2016) Relation among physical function, disease severity and quality of life in individuals with Parkinson disease. American Physical Therapy Association (APTA) Combined sections meeting (CSM). Anaheim, CA Feb 17-20 2016.
38. Lansdell, B., Milovanovic, I., Fairhall, A., Fetz, E., Moritz, C. (2016) Neural activity in a simultaneous BCI & manual task. 6th International Brain-Computer Interface Meeting. Asilomar, CA, May 2016.
39. Richner, T.J., Mahoney, B., Ranganathan, V., Moore, G.,Boyer, S.D., Solinsky, R., Horwitz, G.D., Anikeeva, P.O., Smith, J.R., Moritz, C.T. (2016). Development of a Wireless Neuromodulation System for the Bladder. North American Neuromodulation Society (NANS) and Neural Interfaces Conference (NIC). Baltimore MD, June 25-29, 2016.
40. Sunshine, M.D., Ganji, C.N., Reier, P.J., Fuller, D.D., Moritz, C.T. (2016) Intraspinal activation of respiratory muscles depends on phase of respiratory cycle. Society for Neuroscience Annual meeting, San Diego, CA. Nov. 12-16, 2016.
41. Richner, T.J., Mahoney, B., Boyer, S.D., Ranganathan, V., Sunshine, M., Moore, G., Solinsky, R., Horwitz, G.D., Anikeeva, P.O., Smith, J.R., Fawcett, J.W., Moritz, C.T. (2016). Closed-loop neural interfacing strategies for the bladder. Society for Neuroscience Annual meeting, San Diego, CA. Nov. 12-16, 2016.
42. Mondello, S.E., Sunshine, M.D., Fischedick, A.E., Horner, P.J., Moritz, C.T. (2016). A micro-LED implant for long-term optogenetic stimulation of the rat spinal cord. Society for Neuroscience Annual meeting, San Diego, CA. Nov. 12-16, 2016.
43. Bjanes, D.A., Fairhall, A.L., Moritz, C.T. (2016). Stimulation strategies to convey sensory information directly to the cortex via intracortical microstimulation (ICMS). Society for Neuroscience Annual meeting, San Diego, CA. Nov. 12-16, 2016.
44. Goshi N., Vomero, M., Richner, T. J., Maggiolini, E., Zucchini, E. Castagnola, E., Bjanes, D., Dryg I., Shain, W., Perlmutter, S. I., Ricci, D., Fadiga, L., Moritz, C. T., Kassenge, S. (2016) Surface and penetrating glassy carbon integrated microelectrode array for recording low and high frequency neural signals. Society for Neuroscience Annual meeting, San Diego, CA. Nov. 12-16, 2016.
45. Gilbertson, T., Bjornson, K.., Price, R., McCoy, S., Moritz, C. (2017) NeuroGame Therapy for the Improvement of Ankle Control in Children with Cerebral Palsy. APTA Combined Sections Meeting, San Antonio, TX, February 15-17, 2017.
46. Solinsky, R., Richner, T., Moritz, C. (2017) Foundational research for a next-generation, optogenetics based bladder neuroprosthesis for individuals with SCI. 4th International Autonomic Symposium, Vancouver, BC, CAN. Feb. 22, 2017. *Winner of Best Oral Presentation Award.

47. Bjanes, D.A., Kassegne, S., Moritz, C.T. (2017). Parameterization of electrical stimulation for modulating intensity of a sensory percept. Society for Neuroscience Annual meeting, Washington DC. Nov. 18-22, 2017.
48. Hofstetter, C.P., Inanici, F., Samejima, S., Khaing, Z.Z., Gad, P. Edgerton, R., Perlmutter, S.I., Moritz, C.T. (2017) Transcutaneous electrical cervical stimulation: Preliminary clinical results and a novel translational model. International Symposium on Neural Regeneration (ISNR), Asilomar, CA Nov 30-Dec 4 2017.
49. Alvarez, V., Edwards, K., Mahoney, W.M., Morales, C., Moritz, C.T., Price, R.M., Risques, R (2018). Portfolio of Postdoc-to-Faculty Programs at University of Washington. National AGEP Conference, Berkeley, CA March 15-16, 2018.
50. Samejima, S., Khorasani, A., Boissenin, A., Ranganathan, V., Smith, J.R., Moritz C.T. (2018). Brain Controlled Epidural Spinal Interface Reanimating Forelimb Function in Spinal Cord Injury. Seventh International Brain Computer Interface Meeting. Asilomar, CA May 21 – 25, 2018.
51. Inanici, F., Samejima, S., Gad, P., Edgerton, V.R., Hofstetter, C.P., Moritz, C.T. (2018) Therapeutic potential of transcutaneous electrical spinal stimulation on upper extremity functions in cervical spinal cord injury: a case study. ASIA meeting, Rochester, MN. May 2-4, 2018
52. Inanici, F., Samejima, S., Gad, P., Edgerton, V.R., Hofstetter, C.P., Moritz, C.T. (2018) Activation of cervical networks via transcutaneous spinal cord stimulation promotes both immediate and long-lasting restoration of upper extremity function in chronic tetraplegia. 57th Annual Scientific Meeting of the International Spinal Cord Society, International Convention Centre, Sydney, Australia. 13-15 September 2018.
53. Oh, J., Samejima, S., Khorasani, A., Boissenin, A., Moritz, C.T. (2018). Simultaneous Recording of Micro-Electrocorticography and Local Field Potentials for Decoding Rat Forelimb Movement. Twenty-seventh Annual Computational Neuroscience Meeting CNS, Seattle, WA
54. Inanici, F., Samejima, S., Gad, P., Edgerton, V.R., Hofstetter, C.P., Moritz, C.T. (2018) Restoring upper extremity function using concurrent transcutaneous cervical spinal cord stimulation and task specific training in chronic spinal cord injury. Society for Neuroscience Annual meeting, San Diego, CA November 3-7, 2018
55. Sanitta Thongpang , Mieko Hirabayashi, Elisa Castagnola, Surabhi Nimbalkar, Brinda Cariappa, Claudia Cea, Amanda Fischedick, Paul Phillips, Sam Kassegne, Chet T. Moritz (2018) Development of a multi-functional glassy-carbon electrode for simultaneous stimulation and measurement of neurotransmitter response in the spinal cord. Society for Neuroscience Annual meeting, San Diego, CA November 3-7, 2018
56. Samejima, S., Khorasani, A., Boissenin, A., Ranganathan, V., Smith, J.R., Moritz C.T. (2018) Restoring graded forelimb movement after spinal cord injury with cortical-local field potential control of epidural spinal stimulation. Society for Neuroscience Annual meeting, San Diego, CA November 3-7, 2018.

National and International Invitational Lectures

1. Keynote Speaker, University of Calgary Medical Science Trainee Symposium (2009) *A brain-machine interface for the treatment of paralysis.*
2. Presidential Lecture, Association for Applied Psychophysiology & Biofeedback (2009) *Direct control of paralyzed muscles by cortical neurons: Implications for biofeedback in the treatment of paralysis.* Albuquerque, NM.
3. Symposium speaker, International Spinal Research Trust Network Meeting, London, UK (2011) *Neuroprosthetic approaches to the treatment of SCI.*
4. Symposium Speaker**,** International Symposium on Neural Regeneration (2011) *Leveraging neural plasticity for the treatment of paralysis and other movement disorders.* Asilomar¸ CA.
5. Keynote Address, Association for Applied Psychophysiology & Biofeedback (2013) *Neural Devices and Biofeedback for Rehabilitation of the Damaged Central Nervous System.* Portland, OR.
6. Plenary Presentation, International Collaboration on Repair Discoveries (ICORD) Trainee Symposium (2013), *Neural engineering techniques to activate and rehabilitate the injured spinal cord,* Vancouver, BC.
7. Invited Speaker, 8th Annual Working 2 Walk Symposium (2013) *Neural devices to activate and rehabilitate the injured spinal cord,* Boston, MA.
8. Invited Speaker, 9th Annual Working 2 Walk Symposium (2014) *Development of a brain-computer-spinal interface to restore hand & arm function,* Seattle, WA.
9. Invited Speaker, Spinal Cord Injury: Mechanisms to Restore Function (2015). *Neural devices to activate and rehabilitate the injured spinal cord.* Salk Institute, La Jolla, CA.
10. Merrill P. Spencer, M.D., Endowed Lectureship (2016). *Neural interfaces and other advanced technology for stroke recovery*. Swedish Hospital, Seattle, WA.
11. Invited Speaker, NIH Standards in Brain Computer Interfaces workshop (2016). National Institutes of Health (NIH), Bethesda, MD.
12. Invited Speaker, IV Step Conference on Neurological and Pediatric Physical Therapy (2016). *Developing neuroprosthetic devices to promote plasticity and rehabilitation after brain and spinal cord injury*. Columbus, OH.
13. Plenary Lecture, Annual Neuromuscular Plasticity Symposium (2017) *Neural devices to promote plasticity and recovery following spinal cord injury.* University of Florida, Gainesville, FL.
14. Keynote Speaker, RehabWeek2017 (2017) *Translation of neural devices to promote plasticity and recovery following central nervous system injury.* London, UK.
15. Invited Speaker, 12th Annual Working 2 Walk Symposium (2017) *Improving hand and arm function after spinal cord injury.* Miami, Florida.

National and International Presentations

1. Dept. of Integrative Physiology, Univ. of Colorado (2003) *Control and mechanics of bouncing gaits on natural surfaces*. Boulder, CO.
2. School of Kinesiology, Simon Fraser University (2005) *Challenges in reanimating the limbs after spinal cord injury: the interplay of biomechanics & neural control.* Burnaby, BC*.*
3. Dept. of Cell Biology and Neuroscience, Univ. of Alberta (2007) *Toward a neuroprosthetic for reanimating paralyzed limbs.* Edmonton, AB.
4. Dept. of Biology, Psychology and Behavioral Neuroscience, Western Washington Univ. (2010). *Promoting neural plasticity for the treatment of paralysis and other movement disorders.* Bellingham, WA*.*
5. The Northwest Intermountain consortium (NIC) of Physical Therapy Clinical Education Conference (2011). *Translating pathophysiology knowledge into physical therapy practice.* Tacoma, WA.
6. Neurosurgery Grand Rounds, University of Kansas Medical School (2011). *Developing neuroprosthetics for the treatment of paralysis following CNS injury.* Kansas City, MO.
7. International Functional Electrical Stimulation Society (2012). *Cervical intraspinal micro-stimulation improves forelimb motor recovery after spinal contusion injury*. Banff, AB.
8. DARPA RE-NET PI meeting (2012) *A Brain-Machine-Spinal Interface (BMSI) to replace and repair the injured nervous system.* New Orleans, LA.
9. DARPA RE-NET Review meeting (2014) *A Brain-Machine-Spinal Interface (BMSI) to replace and repair the injured nervous system.* Scottsdale, AZ.
10. Invited Speaker, NeuroFutures Conference (2014). *Restoring function after spinal cord injury: cortico-spinal neuroprostheses,* Seattle, WA.
11. Speaker and Co-organizer, Joint DFG-NSF Workshop on New Perspectives of Neurotechnology and Neuroengineering. (2014) *Brain-controlled spinal stimulation for reanimation of the paralyzed forelimb*, Washington DC.
12. Allen Distinguished Investigator Life Sciences Symposium (2015). Development of a Brain-Computer-Spinal Interface (BCSI). La Jolla, CA
13. Bioelectronic Medicine Grand Challenge meeting (2015). BIONIC approach to optical control of unrinary continence. Los Angeles, CA.
14. Session organizer and introductory speaker, International Symposium on Neural Regeneration (2015), Asilomar CA.
15. Department of Integrative Physiology Colloquium, University of Colorado (2016) *Developing Neural Devices to Promote Plasticity and Recovery After Spinal Cord Injury*, Boulder, CO.
16. Department of Neurobiology and Anatomy, Drexel University (2016) *Neural Devices to Promote Plasticity and Recovery After Spinal Cord Injury.* Philadelphia, PA.
17. Invited Speaker, NeuroFutures Conference (2016). *Neuroprosthetic strategies to improve function after brain and spinal cord injury.* Seattle, WA.
18. Invited Speaker, North West Medical Laboratory Symposium (2016). *Biodevices & neurotechnology to improve quality of life after brain & spinal cord injury.* Portland, OR.
19. Session organizer and speaker (2017). *Neural devices to promote reanimation & recovery after spinal cord injury.* Christopher and Dana Reeve Foundation's Spinal Cord

Injury: Translational Approaches to Mechanistic Studies. The Salk Institute, San Diego, CA.

20. Department of Biomedical Engineering, University of Michigan (2017). *Neural devices to promote plasticity and recovery following spinal cord injury.* Ann Arbor, MI.
21. International Spinal Research Trust (ISRT) Annual Meeting (2017). *Neural devices to promote plasticity and recovery following spinal cord injury.* London, UK.
22. School of Biological & Health Systems Engineering, Arizona State University (2017) *Neural devices to promote plasticity and recovery following spinal cord injury*. Tempe, AZ.
23. CITRIS and the Banatao Institute, University of California Santa Cruz (2017). *Neural devices to improve hand and arm function after brain and spinal cord injury*. Santa Cruz, CA.
24. Invited Speaker, Biennial meeting of the International Motoneuron Society (2018). Therapeutic stimulation for recovery of function after spinal cord injury. Boulder, Colorado.

Local Presentations

1. Neurobiology and Behavior, Univ. of Washington (2007) *Toward a neuroprosthetic for reanimating paralyzed limbs.* Seattle, WA.
2. H.D. Patton Symposium, Physiology and Biophysics, Univ. of Washington (2007) *Using brain activity to control stimulation of paralyzed muscles.* Seattle, WA.
3. Computational Neuroscience Connection, University of Washington (2009) *Brain-machine interfaces: Giving priority to the most intelligent controller.* Seattle, WA.
4. H.D. Patton Symposium, Physiology and Biophysics, Univ. of Washington (2009) *Leveraging technology for the treatment of movement disorders.* Seattle, WA.
5. Department of Rehabilitation Medicine, University of Washington (2009) *Neuroprosthetic technology for the treatment of movement disorders.* Seattle, WA.
6. Department of Rehabilitation Medicine, University of Washington (2010) *Developing technology for the treatment of movement disorders.* Seattle, WA.
7. H.D. Patton Symposium, Physiology and Biophysics, Univ. of Washington (2010) *Promoting neural plasticity for the treatment of movement disorders.* Seattle, WA.
8. Grand Rounds, Department of Rehabilitation Medicine, University of Washington (2010) *Shaping neural activity for the treatment of paralysis and other movement disorders.* Seattle, WA.
9. UW TAPAS, South Lake Union Seminar Series (2011) *Promoting neural plasticity for the treatment of movement disorders.* Seattle, WA.
10. Northwest Regional Spinal Cord Injury System, Consumer Forum (2011) *Developing neuroprosthetic treatments for spinal cord injury.* Seattle, WA.
11. Pacific Northwest American Academy of Orthotists and Prosthetists Annual Meeting (2011) *Brain Computer Interfaces (BCI): Implications for the Future of Prosthetics & Orthotics.* Seattle, WA.
12. Harborview Medical Center Department of Rehabilitation Therapies Stroke Symposium (2011) *Computer Brain Interfaces for Stroke Rehabilitation.* Seattle, WA.

13. Neurobiology and Behavior program, Univ. of Washington (2011) *Leveraging neural plasticity for the treatment of paralysis and other movement disorders.* Seattle, WA.
14. UW Medicine SCI Core Group (2012) *Electrostimulation methods for spinal cord rehabilitation.* Seattle, WA.
15. UW Institute for Stem Cell and Regenerative Medicine, Symposium on Neural Regeneration: Cell engineering to cell therapy (2012) *Can neural devices replace or repair the damaged CNS?* Seattle, WA.
16. Center for Sensorimotor Neural Engineering (2012) *Neural Engineering to Replace, Repair, and Rehabilitate the Central Nervous System.* Seattle, WA.
17. Justus F. Lehman Day (2012) *Neural Technology to Rehabilitate, Replace, or Regenerate the Damaged Central Nervous System.* Seattle, WA.
18. Seattle Public Library (2012) Neuroscience community outreach. *Brain-Computer Interfaces to replace or repair the injured central nervous system.* Seattle, WA.
19. Electrode workshop: Center for Sensorimotor Neural Engineering (2013) *Cortical Recording Performance and Neuroprosthetic Applications.* Seattle, WA.
20. International Symposium on Cognitive Neuroscience Robotics (2013) *Intraspinal stimulation for re-animation and repair of the injured spinal cord.* Seattle, WA.
21. TriBeta Undergraduate Biology Club, Department of Biology (2013) *Neuroprosthetic Technology: Treatment of paralysis and other movement disorders.* Seattle, WA.
22. Center for Integrative Brain Research, Seattle Children's Research Institute (2013). *Neural Devices for Rehabilitation of the Injured Central Nervous System.* Seattle, WA.
23. Grand Rounds, Department of Rehabilitation Medicine, University of Washington (2013) *Neural Devices for Rehabilitation of the Injured Central Nervous System.* Seattle, WA.
24. Animal Welfare Office, University of Washington (2014) *Animal models for the development of neural devices to treat paralysis.* Seattle, WA.
25. Math-Science Upward Bound (MSUB) summer program for underrepresented high school students (2014) *Neural devices to restore function after spinal cord injury.* Seattle, WA.
26. Keynote Speaker, Spinal Cord Injury (SCI) Wellness Summit (2014). *Restoring function after spinal cord injury: New research in neural stimulation,* Seattle, WA.
27. H.D. Patton Symposium, Physiology and Biophysics, Univ. of Washington (2014) *Neural devices to restore function after spinal cord injury.* Leavenworth, WA.
28. Computational Neuroscience Connection (2014) *Projects and challenges at the Center for Sensorimotor Neural Engineering.* Seattle, WA
29. Department of Rehabilitation Medicine All Staff Meeting, University of Washington (2014) *Neural technology to restore, repair or rehabilitate the injured brain and spinal cord.* Seattle, WA.
30. Department of Neurological Surgery Grand Rounds, University of Washington (2014). *Developing neuroprosthetic devices to restore function after brain and spinal cord injury*. Seattle, WA
31. Program in Neuroscience Seminar Series, University of Washington (2015). *Neural devices to activate and rehabilitate the injured spinal cord.* Seattle, WA

32. Jelinek Summer Workshop on Speech and Language Processing (2015). *Neural Engineering and Neuroprostheses*. Seattle WA.
33. Electrical Engineering Department, University of Washington (2016). *Bioelectronic devices to improve quality of life after spinal cord injury*. Seattle, WA.
34. Math-Science Upward Bound (MSUB) summer program for underrepresented high school students (2016) *Neural devices to restore function after spinal cord injury.* Seattle, WA.
35. Neurology Grand Rounds (2017) *Neural devices to promote plasticity and recovery following central nervous system injury.* Seattle, WA.
36. Northwest Regional Spinal Cord Injury System, Consumer Forum (2017) *Neural devices to promote plasticity and recovery following spinal cord injury.* Seattle, WA.
37. University of Washington Institute of Neuroengineering (UWIN), University of Washington (2017) *Neural devices to promote plasticity and recovery following spinal cord injury.* Seattle, WA
38. Grand Rounds, Department of Rehabilitation Medicine, University of Washington (2017) *Stimulation of the spinal cord to improve function after injury.* Seattle, WA.
39. Comparative Medicine Compassion Fatigue Committee, University of Washington (2018). *Treating spinal cord injury: from animal models to human trials.* Seattle, WA.
40. Department of Neurological Surgery Grand Rounds, University of Washington (2018). *Neural devices to promote plasticity and recovery following spinal cord injury*. Seattle, WA