

Wallace H. Coulter Department of Biomedical Engineering
Emory University and Georgia Tech
Emory Rehabilitation Hospital, Room R154
1441 Clifton Road
Atlanta, GA 30322

Voice: (404) 550-5157
Fax: (404) 727-9873
e-mail: j.lucas.mckay@emory.edu

Current Positions

Assistant Professor, Research Track 10/2013–present
Coulter Department of Biomedical Engineering at Emory University and Georgia Tech

Education/Training

Post-Doc, Movement Disorders– 03/2016–present
Emory University Movement Disorders Clinic
Atlanta, GA
*NIH–Sponsored K25 Trainee

M.S., Clinical Research– 08/2014–07/2016
Emory University, Atlanta, GA.
*Thesis Title: A cross-sectional study of set shifting impairments and falling in individuals with and without Parkinson's disease.
*NIH–Sponsored KL2 Scholar

Post-Doc, Human Movement Science– 08/2010–09/2013
Emory University, Atlanta, GA.

Ph.D., Electrical and Computer Engineering– 08/2003–07/2010
Georgia Institute of Technology, Atlanta, GA.
*Dissertation Title: Neuromechanical constraints and optimality for balance.

Sc.M., Electrical Engineering– 08/2002–05/2004
Brown University, Providence, RI.
*Thesis Title: A low-power pipelined A/D converter for neural signals.

Sc.B., Electrical Engineering– 08/1998–05/2002
Brown University, Providence, RI.

Journal Papers (peer reviewed)

- 10.* **McKay JL**, Ting LH, Hackney ME, 2016. Balance, body motion and muscle activity after dance-based rehabilitation in individuals with Parkinson's disease: a pilot study. *J Neurol Phys Ther* 40(4):257-68. (2016).
9. Chen TL, Bhattacharjee T, **McKay JL**, Borinski JE, Hackney ME, Ting LH, Kemp CC, 2015. Evaluation by expert dancers of a robot that performs partnered stepping via haptic interaction. *PLoS ONE* 10(5):e0125179. (2015).
8. **McKay JL**, Welch TDJ, Vidakovic B, Ting LH, 2013. Statistically-significant contrasts between EMG waveforms revealed using wavelet-based functional ANOVA. *J Neurophysiol* 109: 591-602. (2013).
7. Sohn MH, **McKay JL**, Ting LH, 2013. Defining feasible bounds on muscle activation in a redundant biomechanical task: practical implications of redundancy. *J Biomech.* 46: 1363–1368. (2013).
6. **McKay JL**, Ting LH, 2012. Optimization of muscle activity for task-level goals predicts complex changes in limb forces across biomechanical contexts. *PLoS Comp Biol* 8: e1002465. (2012).
5. Bunderson NE, **McKay JL**, Ting LH, Burkholder TJ, 2010. Directional constraint of endpoint force emerges from hindlimb anatomy. *J Exp Biol* 213: 2131-2141. (2010).

4. **McKay JL**, Ting LH, 2008. Functional muscle synergies constrain force production during postural tasks. *J Biomech* 41: 299-306. (2008).
3. **McKay JL**, Burkholder TJ, Ting LH, 2007. Biomechanical capabilities influence postural control strategies in the cat hindlimb. *J Biomech* 40: 2254-2260. (2007).
2. Song Y-K, Patterson WR, Bull CW, Beals J, Hwang N, Deangelis AP, Lay C, **McKay JL**, Nurmikko AV, Fellows MR, Simeral JD, Donoghue JP, Connors BW, 2005. Development of a chipscale integrated microelectrode/microelectronic device for brain implantable neuroengineering applications. *IEEE Trans Neur Sys Rehab Eng* 13: 220-226. (2005).
1. Patterson WR, Song Y-K, Bull CW, Ozden I, Deangelis AP, Lay C, **McKay JL**, Nurmikko AV, Donoghue JD, Connors BW, 2004. A microelectrode/microelectronic hybrid device for brain implantable neuroprosthesis applications. *IEEE Trans BME* 51: 1845-1853. (2004).

*designates corresponding author

Engineering Conference Papers (peer reviewed)

1. Song YK, Patterson WR, Bull CW, Hwang NJ, Deangelis AP, Lay C, **McKay JL**, Nurmikko AV, Donoghue JD, Connors BW, 2004. Development of an integrated microelectrode/microelectronic device for brain implantable neuroengineering applications. *IEEE EMBS* 6: 4053-6. (2004).

Journal Manuscripts in Review

1. Sawers A, Bhattacharjee T, McKay JL, Hackney ME, Kemp CC, Ting LH, 2016. Small Forces can Communicate Movement Goals and Distinguish Expert and Novice Human-Human Physical Interaction. *J NeuroEng Rehabil*. (In review).

Journal Manuscripts in Preparation

Data collection complete

7. **McKay JL**, Bozzorg A, Nocera J, Hackney ME, 2016. The influence of Parkinson's disease and neurotypical aging on cognitive performance among volunteers for a community-based rehabilitative intervention. *Aging Neuropsych Cogn*. (In prep).
6. Allen JA, Sawers A, **McKay JL**, Hackney ME, Ting LH, 2016. Increased neuromuscular consistency in gait and balance after successful mobility rehabilitation in Parkinson's disease. *J Neurophysiol*. (In prep).
5. **McKay JL**, Lang KC, Factor DO, Ting LH, Hackney ME, 2016. A cross-sectional study of set shifting impairments and falling in individuals with and without Parkinson's disease. *Mov Disord*. (In prep).
4. Lang KC, Hackney ME, Ting LH, **McKay JL**, 2016. Lower limb cocontraction during balance in unselected PD patients and neurotypical individuals. *J Neurophysiol*. (In prep).
3. **McKay JL**, Lang KC, Ting LH, Hackney ME, 2016. Effects of partner role in dance-based therapy for parkinson disease: a prospective study. *Mov Disord*. (In prep).
2. **McKay JL**, Lang KC, Hackney ME, Ting LH, 2016. Altered sensorimotor control of balance in Parkinson's disease. *Nat Neuro*. (In prep).
1. Lang KC, Hackney ME, Ting LH, **McKay JL**, 2016. Does effective adapted tango rehabilitation improve postural response modulation across stance widths during balance in Parkinson's disease? A pilot study. *Gait Posture*. (In prep).

Data collection in progress

1. **McKay JL**, Hatcher-Martin J, Factor SA, Nocera J, 2016. Gait abnormalities associated with suspected cholinergic deficits in Parkinson's disease. *Gait Posture*. (In prep).

Review Articles

- 4.* Ting LH, Chiel HJ, Trumbower RD, Allen JL, **McKay JL**, Hackney ME, Kesar TM, 2015. Neuromechanical principles underlying movement modularity and their implications for rehabilitation. *Neuron* 86: 38-54. (2015).
3. Ting LH, Chvatal SA, Safavynia SA, and **McKay JL**, 2012. Review and perspective: neuromechanical considerations for predicting muscle activation patterns for movement. *Int J Num Meth Biomed Eng* 28: 1003-1014. (2015).
2. Ting LH, van Antwerp KW, Scrivens JE, **McKay JL**, Welch TDJ, Bingham JT, DeWeerth SP, 2009. Neuromechanical tuning of nonlinear postural control dynamics. *Chaos* 19: 026111-026112. (2009).
1. Ting LH, **McKay JL**, 2007. Neuromechanics of muscle synergies for posture and movement. *Curr Opin Neurobiol* 17: 622-628. (2007).

*designates invited review

Professional Courses Attended

2013 NIH TIGRR (Training in Grant Writing in Rehabilitation Research) Fellow

Honors and Awards

2016-2017 Clinical Loan Repayment Program (LRP) Award, National Institutes of Health / National Institute of Neurological Disorders and Stroke (NIH/NINDS)

2015 Burroughs-Wellcome Fund Trainee Travel Award

2014-2016 Clinical Loan Repayment Program (LRP) Award, National Institutes of Health / National Institute of Neurological Disorders and Stroke (NIH/NINDS)

2014-2016 KL2 Mentored Clinical and Translational Research Scholar Award, NIH/Atlanta Clinical and Translational Science Institute (ACTSI)

2004 Sigma Xi, Scientific Research Society, inducted, 2004

2003-2007 President's Fellowship, Georgia Institute of Technology

2001 Tau Beta Pi, Engineering Honor Society

News and Press

2. Woodruff Health Sciences Center. (2016). Research shows Adapted Tango program alters balance control in Parkinson's disease patients [Press release]. Retrieved from http://news.emory.edu/stories/2016/10/ting_mckay_tango_study/index.html
1. Woodruff Health Sciences Center. (2016). NIH grants support research on balance in Parkinson's and other diseases [Press release]. Retrieved from http://news.emory.edu/stories/2016/10/mckay_lucas_grants/index.html

Current Grant Support

NIH K25HD086276-01 (McKay, PI)

09/2016-09/2020

Neural mechanisms of balance deficits, falls, and freezing of gait in Parkinson's disease

NIH/NICHD/NCMRR Mentored Quantitative Research Development Award

Research Objectives: To translate analyses of balance control developed in animal models and healthy young individuals to identify new predictors of fall risk among PD patients and to understand determinants of freezing of gait. Training Objectives: To provide the PI with didactic and mentored training in PD pathophysiology and clinical management.

Role: PI

Primary Mentors: Thomas Wichmann, M.D., Stewart Factor, D.O.

Total Direct Costs: \$509K

NIH R21 HD075612-02 (Ting, PI)

08/2013-05/2015 (NCE to 05/2017)

Mechanisms of improvement in neurorehabilitation of Parkinson's Disease

NIH/NICHD/NCMRR Exploratory/Developmental Research Grant Award

Objective: To differentially identify mechanisms of adaptation during perturbed balance control before and after an adapted tango intervention.

Role: Co-I

Total Direct Costs: \$325K

Pending Grant Support

VA Merit (Hackney, PI)

02/2017–01/2021

Rehabilitation Mechanisms in Parkinson's Disease and Minor Cognitive Dysfunction

Objectives: To identify effective treatment strategies for people with comorbid Parkinson's Disease (PD) and mild cognitive impairment (MCI) and to identify underlying mechanisms to guide the development of improved rehabilitative options for postural control.

Role: Co-I

Submitted: 06/2016

Total Direct Costs: \$1.1M

R01 (Ting, PI)

04/2017–03/2022

Neuromechanical Modeling of Postural Responses: Mechanisms of Balance Impairments in Parkinson's Disease

Objectives: To use novel computational and experimental techniques to advance mechanistic understanding of how muscle rigidity, a cardinal sign of PD, contributes to balance impairments in carefully-selected akinetic/rigid PD patients.

Role: Co-I

Submitted: 06/2016

Total Direct Costs: \$2.2M

Google Faculty Research Award (McKay, PI)

Nominally 1 year, unrestricted

Reducing transportation barriers to exercise rehabilitation for people with Parkinson's disease: a potential early application for self-driving technology

Objectives: 1) To develop backend and user-facing technology that will connect Parkinson's patients with crowd-funded free rides to exercise-based rehabilitation via e-hail or self-driving technology. 2) To demonstrate that free rides to rehab improve outcomes in a randomized trial.

Role: PI

Co-Investigators: Clifford, Hackney

Submitted: 09/30/2016

Total Direct Costs: \$150K

Alternate funding sources: PCORI, HIP pilot program

Past Grant Support

NIH KL2TR000455 and ULI TR000454 (Stephens, PI)

08/2014–07/2016

NIH/NCATS Mentored Clinical and Translational Research Scholar Award

Reactive balance to identify disease phenotypes and predict falls in Parkinson's disease

Research Objectives: to compare reactive balance control in tremor-dominant (TD) and postural instability and gait dominant (PIGD) PD phenotypes and to obtain preliminary data on associations between reactive balance deficits and fall risk in a small sample of PD patients. Training Objectives: to provide the KL2 scholar with didactic training in clinical research design, biostatistical analysis, and epidemiology.

Role: KL2 Scholar

Total Direct Costs: \$115K to McKay

Pilot Grant (McKay, co-PI, Hackney, co-PI)

04/2012–03/2013

Emory-Udall Parkinson's Disease Center / ACTSI

Mechanisms of balance improvement during Parkinson's disease rehabilitation

Objective: to investigate brainstem-mediated mechanisms of enhanced postural control after motor rehabilitation in individuals with PD in the "ON" medication state.

Role: Co-PI

Total Direct Costs: \$35K

Grants in Preparation

NIH R21 (McKay, PI)

09/2016–08/2018

Wavelet-based functional ANOVA: a novel method to accelerate the pace of biomedical research

NIH/NIBIB Trailblazer Award for New and Early Stage Investigators (R21)

Research Objectives: 1) To develop a Matlab toolbox implementation of wavelet-based functional ANOVA (wfANOVA), a novel method of high dimensional signal processing I developed for EMG analysis, which extends it to generalized-linear model and repeated-measures designs. 1A) To establish a mathematical framework for wfANOVA 1B) 2) To disseminate the toolbox with a series of sponsored events.

Role: PI

Co-Investigators: Ting, Vidakovic (GT)

To be submitted: 02/16/2017

Total Direct Costs: \$400K

Grants Projected

NIH R03 (McKay, PI)

02/2018–01/2020

Gait markers associated with suspected cholinergic deficits in Parkinson's disease

Research Objectives: This proposal will use instrumented, pressure-sensitive gait mats to identify markers of suspected cholinergic deficits in a large series of sequential Parkinson's disease patients.

Role: PI

Potential Co-Investigators: Factor, Hatcher-Martin, Nocera

To be submitted: 06/16/2017

Total Direct Costs: \$100K

NIH R01 (McKay, PI)

09/2018–08/2023

Mapping and optimizing the space of gait and balance space accessible to Deep Brain Stimulation for Parkinson's disease

Research Objectives: This proposal will develop technology to interface with existing Deep Brain Stimulation programming interfaces capable of modulating deep brain stimulation parameters while simultaneously estimating Volume of Tissue Activated (VTA) referenced to preoperative MRI, and recording balance and gait motor outcomes.

Role: PI

Potential Co-Investigators: Factor, Wichmann, Miocinovic, Ting

To be submitted: 02/05/2018

Total Direct Costs: \$2.4M

Grants Submitted but not Awarded

R01 (Clifford, PI)

07/2015–06/2018

A Large Scale Bayesian Crowd-Sourcing Approach for Accurate Medical Labeling and Prediction in Neurophysiological Time Series

Objectives: to develop scalable, standardized, algorithms for segmentation, feature extraction and classification of surface electromyogram (sEMG) data, to create of a gold standard public database of sEMG of young healthy individuals and individuals with and without Parkinson's disease, and to establish standards in sEMG analysis.

Role: Co-I

Submitted: 06/2016

Status: discussed, not awarded

Total Direct Costs: \$900K

Invited Talks

Academic

13.[†] Emory University Movement Disorders Group Research Retreat. Atlanta, GA, USA. *Neural mechanisms of balance deficits, falls, and freezing of gait in Parkinson's disease.* December 3, 2016.

12. 21st Congress of the International Society for Electromyography and Kinesiology. Chicago, IL, USA. *Altered sensorimotor transformations for balance in Parkinson's disease*. July 7, 2016.
11. Birmingham / Atlanta Geriatric Research Education and Clinical Center (GRECC) Planning and Collaboration Meeting. Atlanta, GA, USA. *Mechanisms of reactive balance and falls in Parkinson's disease*. April 20, 2016.
10. Georgia Tech School of Applied Physiology. *Mechanisms of reactive balance and falls in Parkinson's disease*. April 13, 2016.
9. Atlanta VA RR&D Center for Visual and Neurocognitive Rehabilitation. *A cross-sectional study of set shifting impairments and falling in individuals with and without Parkinson's disease*. April 6, 2016.
8. Emory University Morris K. Udall Center for Excellence in Parkinson's Disease Research. *Balance control and falls in Parkinson's disease*. 2015.
7. Georgia Tech BMED7610: Quantitative Neuroscience. *Optimization during hierarchical control of muscles and limbs for balance*. October 29, 2013.
6. Parker H. Petit Institute for Bioengineering & Bioscience at Georgia Tech: Enabling Health through Technologies Workshop. *Identifying functional improvements in balance after Parkinson's disease neurorehabilitation*. October 8, 2013.
5. International Society for Posture and Gait Research Satellite, Akita, Japan. *Feedback control of balance muscle activity in individuals with Parkinson's disease before and after Adapted Tango rehabilitation*. June 22, 2013.
4. Emory University Morris K. Udall Center for Excellence in Parkinson's Disease Research. *Mechanisms of Improvement in Parkinson's Disease Rehabilitation*. 2013.
3. Computational Neuroscience Biology Group, Emory University. *Statistically-significant contrasts between EMG waveforms revealed using wavelet-based functional ANOVA*. 2013.
2. Emory University Morris K. Udall Center for Excellence in Parkinson's Disease Research. *Mechanisms of Improvement in Parkinson's Disease Rehabilitation*. 2012.
1. Laboratory for Neuroengineering, Georgia Tech and Emory University. *The Nervous System Maps High-Dimension Sensory Information to Low-Dimension Motor Outputs during Postural Responses*. 2009.

†designates talks scheduled but not yet presented

Community Outreach

6. Developing a Research Participation Enhancement and Advocacy Training Program for Diverse Seniors (DREAMS) Project. *Analysis and Evaluation of Clinical and Patient-Centered Outcomes Research*. May 5, 2016.
5. Developing a Research Participation Enhancement and Advocacy Training Program for Diverse Seniors (DREAMS) Project. *Mechanisms of reactive balance and falls in healthy aging and in Parkinson's disease*. March 14, 2016.
4. Wesley Woods Interactive Health Seminar, "Health, Wellness and Resiliency." *Balance Deficits, Falls, and Freezing of Gait in Parkinson's Disease*. May 12, 2015.
3. Osher Lifelong Learning Institute: Robust and Resilient Aging: An Update on Healthy Aging Research. *Motor Rehabilitation, PD, EMG measurement, and Biomedical Engineering*. May 20, 2014.
2. Conversations with Community Researchers, American Parkinson Disease Association, Georgia Chapter. *Reactive Balance Control and Falls in Parkinson's Disease*. 2014.
1. Conversations with Community Researchers, American Parkinson Disease Association, Georgia Chapter. *Mechanisms of successful rehabilitation in Parkinson's Disease*. 2013.

Work Presented at Scientific Meetings (unsolicited)

33. **McKay JL**, Ting LH, Hackney ME, 2016. *Changes in balance body motion and muscle activity after Adapted Tango rehabilitation for Parkinson's disease*. In: Fifth Annual Symposium on Regenerative Rehabilitation, Atlanta, GA. October 14-16.
32. Lang KC, **McKay JL**, Hackney ME, Ting LH, 2016. *Does effective Adapted Tango rehabilitation improve postural response modulation across stance widths in individuals with Parkinson's disease?* In: Fifth Annual Symposium on Regenerative Rehabilitation, Atlanta, GA. October 14-16.
31. **McKay JL**, Welch TDJ, Vidakovic B, Ting LH, 2016. *Statistically-significant contrasts between EMG waveforms revealed using wavelet-based functional ANOVA*. In: Fifth Annual Symposium on Regenerative Rehabilitation, Atlanta, GA. October 14-16.
- 30.* **McKay JL**, Welch TDJ, Vidakovic B, Ting LH, 2016. *Wavelet-based functional ANOVA to reveal statistically-significant contrasts between EMG waveforms recorded in different experimental conditions*. In: XXI Congress of the International Society of Electrophysiology and Kinesiology, Chicago, IL. July 5-8.
29. Lang KC, **McKay JL**, Hackney ME, & Ting LH, 2016. *Leg muscle modulation during balance recovery in older adults with and without Parkinson's disease*. In: Translational Science 2016. Washington, DC. April 13-15.
28. **McKay JL**, Ting LH, 2015. *Altered Sensorimotor Transformations for Balance In Parkinson's Disease*. In: Brain States: Characterization and Neuromodulation by DBS. Cologne, Germany. October 11-13.
27. Zhu T, **McKay JL**, Payne A, Ting LH, Clifford G, 2015. *Crowdsourced annotation of EMG onset times in healthy individuals and Parkinson disease*. In: 2015 World Congress of the International Society for Posture and Gait Research. Seville, Spain. June 28-July 2.
26. Lang KC, **McKay JL**, Hackney ME, Ting LH, 2015. *Does effective adapted tango rehabilitation improve postural response scaling in individuals with Parkinson's disease?* In: 2015 World Congress of the International Society for Posture and Gait Research. Seville, Spain. June 28-July 2.
25. **McKay JL**, Ting LH, Hackney ME, 2015. *Improved balance body motion and muscle activity after dance-based rehabilitation in individuals with Parkinson's disease: a preliminary study*. In: Society for the Neural Control of Movement 2015, Satellite Meeting: Neural Mechanisms of Rehabilitation. Charleston, SC. April 20.
24. **McKay JL**, Ting LH, Hackney ME, 2015. *Improved balance body motion and muscle activity after dance-based rehabilitation in individuals with Parkinson's disease: a preliminary study*. In: Translational Science 2015. Washington, DC. April 16-18.
23. Song YS, Chen TL, Bhattacharjee T, **McKay JL**, Hackney ME, Kemp CC, Ting LH, 2015. *Human Arms Remove Energy During Partnered Stepping Tasks with a Robot Follower*. In: Piper Health Solutions Workshop on Rehabilitation Robotics. Phoenix, AZ, USA, February 13-14.
22. Allen JA, **McKay JL**, Hackney ME, & Ting LH, 2014. *Recruitment of subcortical muscle synergies during balance and walking in individuals with Parkinson's disease can be improved through rehabilitation*. In: Society for Neuroscience. Washington, DC, USA. November 15-19.
21. Lang KC, **McKay JL**, Compton H, Harris M, Perry, J, Roberts, C, Hackney, ME, Ting LH, 2014. *Does successful adapted tango rehabilitation improve postural response scaling in individuals with Parkinson's disease?* In: Society for Neuroscience. Washington, DC, USA. November 15-19.
20. Allen JA, **McKay JL**, Ting LH, 2014. *Rehabilitation improves generalization of muscle synergies across balance and walking in individuals with Parkinson's disease*. In: 7th World Congress of Biomechanics. Boston, Massachusetts, July 6-11.
19. Lang KC, Ting LH, **McKay JL**, 2014. *Support surface acceleration affects tibialis anterior onset latency during support surface translation perturbations*. In: 2014 World Congress of the International Society for Posture and Gait Research. Vancouver, British Columbia, Canada, June 29-July 3.
- 18.* **McKay JL**, Welch TDJ, Vidakovic B, Ting LH, 2014. *Wavelet-based functional ANOVA to reveal statistically-significant contrasts between EMG and kinematics recorded in different experimental conditions*. In: 2014 World

Congress of the International Society for Posture and Gait Research. Vancouver, British Columbia, Canada, June 29-July 3.

17. **McKay JL**, Ting LH, & Hackney ME, 2014. *Adapted tango alters center of mass displacement and muscular activity during reactive balance in individuals with Parkinson's disease*. In: 2014 World Congress of the International Society for Posture and Gait Research. Vancouver, British Columbia, Canada, June 29-July 3.
- 16.* Ting LH, **McKay JL**, Hackney ME, 2014. *Exercise-based neurorehabilitation improves sensorimotor responses to perturbation in individuals with Parkinson's disease*. In: 24th Annual Meeting of the Society for the Neural Control of Movement. Amsterdam, The Netherlands, April 22-25.
- 15.* **McKay JL**, Ting LH, Hackney ME, 2013. *Feedback control of balance muscle activity in individuals with Parkinson's disease before and after adapted tango rehabilitation*. In: 2nd Joint World Congress of ISPGR and Gait & Mental Function. Akita, Japan, June 22-26.
14. Chen TL, **McKay JL**, Bhattacharjee T, Hackney ME, Kemp CC, Ting LH, 2013. *Partnered human-robot stepping based on interactive forces at the hand*. In: Piper Health Solutions Workshop on Rehabilitation Robotics. Phoenix, AZ, USA, February 22-23.
13. **McKay JL**, Huang M, Chen TL, Bhattacharjee T, Hackney ME, Kemp CC, Ting LH, 2013. *A simple model of dynamic interaction forces during human-robot partnered motion*. In: Piper Health Solutions Workshop on Rehabilitation Robotics. Phoenix, AZ, USA, February 22-23.
12. Chen TL, **McKay JL**, Bhattacharjee T, Hackney ME, Kemp CC, Ting LH, 2012. *Partnered human-robot stepping based on interactive forces at the hand*. In: American Society of Biomechanics. Gainesville, FL, USA, August 15-18.
11. Sohn MH, **McKay JL**, Ting LH, 2012. *Biomechanics constrains variability in spatial structure of muscle coordination for endpoint force generation*. In: American Society of Biomechanics. Gainesville, FL, USA, August 15-18.
10. **McKay JL**, Welch TDJ, Vidakovic B, Ting LH, 2012. *Statistically-significant contrasts between EMG waveforms revealed using wavelet-based functional ANOVA*. In: American Society of Biomechanics. Gainesville, FL, USA, August 15-18.
9. **McKay JL**, Welch TDJ, Vidakovic B, and Ting LH, 2011. *A method to determine statistically-significant differences between EMG waveforms in the time domain using wavelet-based functional-ANOVA*. Program No. 812.03. In: Society for Neuroscience. Washington, D.C., USA.
- 8.* **McKay JL**, Ting LH, 2010. *Muscle synergies produce expensive behavioral biases during postural control*. In: Society for the Neural Control of Movement. Naples, Florida, USA.
7. **McKay JL**, Ting LH, 2010. *Muscle synergies reflect optimal control of task-level variables during balance*. In: Society for Neuroscience. San Diego, CA, USA.
6. **McKay JL**, Ting LH, 2009. *The nervous system maps high-dimension sensory inflow to low-dimension motor outputs during postural responses*. In: Advances in Computational Motor Control 8. Chicago, IL, USA, November 11.
5. **McKay JL**, Ting LH, 2009. *Muscle synergy dimensionality is independent of perturbation dimensionality during postural control*. Program No. 81.7. In: Society for Neuroscience. Chicago, IL, USA, November 12-16.
4. **McKay JL**, Ting LH, 2007. *Coordinating muscles and limbs for postural control in the cat*. In: Eighth International Congress of Neuroethology. Vancouver, BC.
3. **McKay JL**, Torres-Oviedo G, Ting LH, 2007. *Neuromechanical modeling of functional muscle synergies for postural control in the cat*. In: American Society of Biomechanics. Palo Alto, CA.
2. **McKay JL**, Ting LH, 2005. *Influence of limb biomechanics on the force constraint strategy for postural control*. Program No. 868.8. In: Society for Neuroscience. Washington DC, USA, November 12-16.
1. **McKay JL**, Ting LH, 2004. *Variation in individual muscle contributions to endpoint force as a function of limb posture and kinematics*. Program No. 306.18. In: Society for Neuroscience. San Diego, CA, USA, October 23-27.

*designates podium presentations

Computer Programs / Datasets

2. **McKay JL**, Welch TDJ, Vidakovic B, Ting LH, 2013. wfANOVAdemo.zip. doi:10.15139/S3/11921. This file includes experimental data and Matlab code to recreate the primary data figure in McKay, et al., 2013. Archive available through Emory University/ODUM Partnership at <http://arc.irss.unc.edu/dvn/dv/jlucasmckay>
1. **McKay JL**, 2012. Dataset S1.csv. doi:10.15139/S3/11922. This file includes musculoskeletal models used in McKay and Ting, 2012. Archive available through Emory University/ODUM Partnership at <http://arc.irss.unc.edu/dvn/dv/jlucasmckay>

Academic Service

Departmental Service

Emory University Movement Disorders Clinic
2016– Organizer, Freezing of Gait Journal Club

Professional/Academic Society Memberships

American Society of Biomechanics
IEEE Engineering in Medicine and Biology Society
International Society for Gait & Posture
International Society for Electrophysiology and Kinesiology
Society for the Neural Control of Movement
Society for Neuroscience

Professional/Academic Society Service

2016 Co-chair, EMG: Signal Processing Symposium Session, 21st Congress of the International Society for Electromyography and Kinesiology. Chicago, IL, USA
2013 Co-organizer, Satellite Symposium, 2nd Joint World Congress of ISPGK and Gait & Mental Function
2013 Ad hoc abstract reviewer, COSYNE
2008 Treasurer, IEEE EMBS Atlanta Chapter

Ad hoc Journal Reviewer

Frontiers in Computational Neuroscience
Gait & Posture
IEEE Transactions on Biomedical Engineering (TBME)
Journal of Biomechanics
Journal of Theoretical Biology
Neuroscience
Scientific Reports
Topics in Stroke Rehabilitation
Transactions on Neural Systems & Rehabilitation Engineering

Mentoring Experience

Visiting Scientists

Maryamnaz Zaribaf, M.D. (2015–2016). Currently a visiting scientist at University of Maryland under Lisa M. Shulman, M.D.

Doctoral Students

Kimberly Lang (Co-mentor, 2015–); Neuroscience, Emory University (Primary Mentor: Lena Ting)

Doctoral thesis committees (not as chair)

Aiden Payne (2016–); Biomedical Engineering, Georgia Institute of Technology (Chair: Lena Ting)

Jeonghee Kim (2016–); Biomedical Engineering, Georgia Institute of Technology (Chair: Omer Inan / Steve DeWeerth)

Kimberly Lang (2015–); Graduate Division in Biological and Biomedical Sciences, Emory University (Chair: Lena Ting)

Emory Doctorate of Physical Therapy (DPT) Research Groups

3. Morgan Bridges, Meredith Ehrenheim, Kristin Muldowney, Madison Ryan, Meghan Stanley; 09/2016–05/2017.
2. Holly Compton, Meg Harris, Jessica Perry, Caroline Roberts; 09/2013–05/2014.
1. Mitchell McCall, Keaton Kramer, Courtney Pope, Austin Ruedrich (winner of the Pamela Catlin Research Award for her work on the affiliated project); 09/2012–05/2013.

Undergraduate Students

Benjamin Wibonele (Summer 2016): Biomedical Engineering, Georgia Tech. Currently attending Morehouse School of Medicine.

Alvince Pongos (Summer 2016): Applied Mathematics, Emory University.