

Aiden Payne  
aidenmpayne@gmail.com

## EDUCATION

- 2008-2010 **Middle Georgia College**, Cochran, GA  
A.S. Biology Degree, May 2010, Full Time Joint High School Enrollment
- 2010-2013 **Georgia Institute of Technology**, Atlanta, GA  
B.S. Biomedical Engineering Degree, Minor in Japanese, August 2013  
Graduated with Highest Honors, GPA 3.67
- 2012 **Ritsumeikan Asia Pacific University** (立命館アジア太平洋大学), Beppu-Oita, Japan  
Eight-week Language, Business, and Technology study abroad program
- 2013 - 2019 **Georgia Institute of Technology** and **Emory University**, Atlanta, GA  
Ph.D. in Biomedical Engineering

## RESEARCH EXPERIENCE

- 2011-2013 Emory University, **Undergraduate Research**, Dr. Hanjoong Jo  
Effect of flow conditions on microRNA expression and the progression of aortic valve disease
- 2013-2014 Emory University, **Graduate Research Rotation**, Dr. Astrid Prinz  
Neuronal network modeling of failure and spontaneous recovery of a central pattern generator
- 2013-2014 Georgia Tech, **Graduate Research Rotation**, Dr. Lena Ting  
Comparison of sparse coding algorithms and nonnegative matrix factorization in the characterization of modularity in human motor control and statistically generated datasets
- 2014 Georgia Tech, **Graduate Research Rotation**, Dr. Craig Forest  
Management and assembly of a patch clamp electrophysiology suite
- 2014 – 2019 Georgia Tech, **Graduate Research Assistant**, Dr. Lena Ting  
The role of the cortex in reactive balance control; computational analysis of the recovery of coordinated automatic postural motor responses after sensory loss
- 2019 – 2021 Emory University, **Post-Doctoral Research Fellow**, Dr. Lena Ting  
The role of the cortex in reactive balance control in Parkinson's disease
- 2021 – Florida State University, **Post-Doctoral Research Fellow**, Dr. Lena Ting  
Investigating the balance N1 and ERN in children with anxiety disorders

## TEACHING EXPERIENCE

- 2013 Georgia Tech, **Undergraduate Grader**, Dr. Charlie Kemp, Introduction to Biomechanics (BMED 3400)
- 2013 Georgia Tech, **Undergraduate Tutor**, Dr. Charlie Kemp, Introduction to Biomechanics (BMED 3400)
- 2014 Georgia Tech, **Graduate Teaching Assistant**, Dr. Lena Ting, Introduction to Biomechanics (BMED 3400)
- 2015 Emory University, **Workshop Teaching Assistant**, Dr. Byron Yu, Dimensionality Reduction in Neural Modeling
- 2015 Georgia Tech, **Graduate Teaching Assistant**, Dr. Cheng Zhu, Introduction to Biomechanics (BMED 3400)
- 2018 Georgia Tech and Emory, **Bioengineering Seminar Series Research Presentation**
- 2018 Emory University, **Invited Guest Lecture** (DPT 971), Dr. Madeleine Hackney, Health in Aging: Patient Care in the 21<sup>st</sup> Century (Fall)
- 2019 Georgia Tech, **Invited Guest Lecture** (BMED 2310), Dr. Wendy Newstetter, Assessing and Modeling Human Standing balance control (Fall)
- 2019 Emory University, **Research Mentor** Clinical Research I (DPT 951)
- 2020 Emory University, **Research Mentor** Clinical Research II (DPT 921)

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2020 Georgia Tech, **Invited Guest Lecture** (BMED 2310), Dr. Wendy Newstetter, Assessing and Modeling Human Standing balance control (Spring)

## RESEARCH SUPPORT

2013-2015 **Emory/GT Computational Neuroscience Training Grant (CNTG)**, two-year graduate research stipend, NIH 5T90DA032466.  
2015 BME Department support.  
2016 **GT Neural Engineering Center Seed Grant**: Measuring and manipulating cortical brain activity for human balance. Ting (PI). To measure (electroencephalography) and manipulate (transcranial magnetic stimulation) event-related potentials during standing balance perturbations.  
2016 **NSF EFRI M3C**: Partnered Rehabilitative Movement: Cooperative human-robot interaction for motor rehabilitation, learning, and communication, Ting (PI). To develop novel predictive models for motor cooperation based on haptic interaction that forge new paths toward fully automated robots that can interact physically to enhance, assist, and improve motor skills in humans with varying motor capabilities.  
2016 **Residential Care Facilities for the Elderly Authority of Fulton County Scholarship**, \$10K Scholarship award to promote research related to aging.  
2017 **Residential Care Facilities for the Elderly Authority of Fulton County Scholarship**, \$10K Scholarship award to promote research related to aging.  
2017 **Udall Pilot Award**: Common neurophysiological markers underlying cognitive and balance deficits in Parkinson's disease. Ting (PI). 30K Pilot award, NIH 1P50NS098685.

## HONORS AND AWARDS

2012 Initiated into **Tau Beta Pi Engineering Honor Society**, Georgia Alpha Chapter  
2013 Graduated with **Highest Honors** at Georgia Tech, GPA 3.67.  
2013 **Atlanta Pediatric Device Consortium**, \$3K project funding to continue development of a pediatric neck brace under guidance of Dr. Jeremy Ackerman and James Rains.  
2014 **Semifinalist**, 2014 Inventure Prize at Georgia Tech.  
2014 **Semifinalist**, 2014 Startup Competition at Georgia Tech.  
2015 **Residential Care Facilities for the Elderly Authority of Fulton County Scholarship**, \$10K Scholarship award to promote research related to aging.  
2016 **Travel Award**, \$450 to cover travel to present a poster at Janelia Conference, Motor Control Circuits, Structure, Function, and Behavior.  
2018 **Andy Zebrowitz Memorial Brain Research Fellowship Award**, \$4K individual scholarship.  
2019 **Diversity Fellow**, \$500 toward attendance of Neural Control of Movement 2019 Annual Meeting in Toyama, Japan.  
2021 **BME Mission Award**, Wallace H. Coulter Department of Biomedical Engineering, recognized for significantly impacting health care and embodying the mission of education and leadership; inspiring productivity and innovative thinking in students and colleagues; and extending effort and leadership across multiple departments/units

## PUBLICATIONS

1. **AM Payne** and LH Ting (2019) Dissociation of muscle and cortical response scaling to balance perturbation acceleration. *Journal of Neurophysiology*. DOI: 10.1152/jn.00237.2018
2. **AM Payne**, LH Ting, and G Hajcak (2019) Do sensorimotor perturbations to standing balance elicit an error-related negativity? *Psychophysiology*. DOI: 10.1111/psyp.13359

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3. **AM Payne** (2019) Perturbation-evoked cortical responses are associated with balance ability in healthy young adults and in older adults with Parkinson's disease. Academic Thesis. Georgia Institute of Technology.
4. **AM Payne** and LH Ting (2020) Worse balance is associated with larger perturbation-evoked cortical responses in healthy young adults. *Gait & Posture*. DOI: 10.1016/j.gaitpost.2020.06.018
5. **AM Payne**, A Sawers, JL Allen, PJ Stapley, JM Macpherson, and LH Ting (2020) Reorganization of reactive balance motor modules following pyridoxine-induced large fiber peripheral sensory neuropathy in cats. *Journal of Neurophysiology*. DOI: 10.1152/jn.00739.2019
6. **AM Payne** and LH Ting (2020) Balance perturbation-evoked cortical N1 responses are larger when stepping and not influenced by motor planning. *J. Neurophys.* DOI:10.1152/jn.00341.2020
7. NJ Ghosn, JA Palmer, MR Borich, LH Ting, and **AM Payne** (2020) Cortical beta oscillatory activity evoked during reactive balance recovery scales with perturbation difficulty and individual balance ability. *Brain Sciences*. DOI: 10.3390/brainsci10110860.
8. JA Palmer, **AM Payne**, LH Ting, and MR Borich (2021) Cortical engagement metrics during reactive balance are associated with distinct aspects of balance behavior in older adults. *Frontiers in Aging Neuroscience*. DOI: 10.3389/fnagi.2021.684743
9. **AM Payne**, JA Palmer, JL McKay, and LH Ting (2021) Lower cognitive set shifting ability is associated with stiffer balance recovery behavior and larger perturbation-evoked cortical responses in older adults. *Frontiers in Aging Neuroscience*. DOI: 10.3389/fnagi.2021.742243

#### MANUSCRIPTS UNDER REVIEW

1. **AM Payne**, JL McKay, and LH Ting (Preprint) Distinct features of the cortical N1 response to balance perturbation are associated with balance and cognitive impairments in Parkinson's disease. bioRxiv. DOI: 10.1101/2022.02.08.479608

#### MANUSCRIPTS IN PREPARATION

1. **AM Payne, LH Ting, and G Hajcak (In Preparation) The balance N1 is associated with the ERN in both young and older adult populations**

#### POSTERS AND PRESENTATIONS AT CONFERENCES

1. **AM Payne**, A Sawers, JL Allen, JM Macpherson, LH Ting (2015) Redundant layers of modular motor control revealed by peripheral sensory loss. Neural Control of Movement Annual Meeting. Charleston, SC. April 20-24. **(Poster)**
2. **AM Payne**, A Sawers, JL Allen, JM Macpherson, LH Ting (2015) Redundant layers of modular motor control revealed by peripheral sensory loss. Emory University Center for Mind, Brain, and Culture, Dimensionality Reduction Workshop. Atlanta, GA. October 30-31. **(Poster)**
3. T Zhu, JL McKay, **AM Payne**, LH Ting, G Clifford (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. **(Poster)**
4. AC Gomez-del Campo, A Sawers, **AM Payne**, LH Ting (2016) Center of pressure mean velocity predicts single limb stance time in experts and novices. XXI Congress of the International Society of Electrophysiology and Kinesiology, Chicago, IL. July 5-8. **(Poster)**

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5. AC Gomez-del Campo, A Sawers, **AM Payne**, LH Ting (2016) Quantifying balance proficiency in experts and novices. Georgia Tech 11<sup>th</sup> Annual Undergraduate Research Symposium. Atlanta, GA. April 19. **(Poster)**
6. **AM Payne**, A Sawers, JL Allen, JM Macpherson, LH Ting (2016) Redundant layers of modular motor control revealed by peripheral sensory loss. Janelia Research Campus, Motor Control Circuits, Structure, Function and Behavior. May 9-12. **(Poster)**
7. **AM Payne**, G Hajcak, LH Ting (2017) Does cortical activity evoked by postural perturbations scale with acceleration? International Society of Posture & Gait Research World Congress, Fort Lauderdale, FL, June 25-29. **(Oral Presentation)**
8. **AM Payne**, G Hajcak, LH Ting (2018) Dissociation of muscle and cortical response scaling to balance perturbation acceleration. Neural Control of Movement Annual Conference, Santa Fe, NM. May 1-4, 2018. **(Poster)**
9. **AM Payne**, G Hajcak, LH Ting (2018) Dissociation of muscle and cortical response scaling to balance perturbation acceleration. Biomedical Engineering Society 2018 Annual Meeting, Atlanta, GA. October 17-20. **(Oral Presentation)**
10. NJ Ghosn, **AM Payne**, LH Ting (2018) Beta oscillatory brain activity increases during reactive balance recovery. Biomedical Engineering Society 2018 Annual Meeting, Atlanta, GA. October 17-20. **(Poster)**
11. **AM Payne**, G Hajcak, LH Ting (2018) Dissociation of muscle and cortical response scaling to balance perturbation acceleration. Neuroscience 2018: 48th Annual Meeting of the Society for Neuroscience, San Diego, CA, USA. November 3-7. **(Poster)**
12. **AM Payne** and LH Ting (2019) Lower balance ability is associated with larger perturbation-evoked cortical responses. Neural Control of Movement Annual Meeting. Toyama, Japan. April 24-27. **(Poster)**
13. NJ Ghosn, **AM Payne**, LH Ting (2019) Elevated beta oscillatory brain activity during reactive balance recovery in older adults with and without Parkinson's disease. Neural Control of Movement Annual Meeting. Toyama, Japan. April 24-27. **(Poster)**
14. JA Palmer, **AM Payne**, MR Borich, LH Ting (2020) Sensorimotor cortical mechanisms during reactive balance in older adults. American Physical Therapy Association Combined Sections Meeting, Geriatrics Section, Denver, CO, USA. Feb 12-15. **(Oral Presentation)**
15. **AM Payne** and LH Ting (2020) Cortical Responses to Balance Perturbation are Abnormal in Parkinson's Disease, American Academy of Neurology 2020 Conference, Toronto, Canada, April 25-May 1. **(conference cancelled)**
16. **AM Payne** and LH Ting (2020) People with worse balance have larger perturbation-evoked cortical N1 responses, American Society for Biomechanics 2020 Conference, Atlanta, GA, August 4-7. **(Oral Presentation)**
17. **AM Payne** and LH Ting (2020) People with worse balance have larger perturbation-evoked cortical N1 responses, Mobile Brain Imaging Conference, San Diego, California, June 7-10. **(conference cancelled)**
18. JA Palmer, **AM Payne**, J Mirdamadi, LH Ting, and MR Borich (2021) Cortical Reactivity during Balance-Correcting Behavior Is Linked to Postural Stability and Walking Function Post-Stroke, American Physical Therapy Association Combined sections meeting, Neurology Section, Virtual, Feb 24-27 **(Poster)**
19. AM Payne, JA Palmer, and LH Ting (2021) Lower cognitive set shifting ability is associated with stiffer balance recovery behavior and larger perturbation-evoked cortical responses, Neural Control of Movement Annual Meeting, Virtual, April 20-22 **(Poster)**

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20. SE Boebinger, **AM Payne**, NJ Ghosn, and LH Ting (2021) Greater cortical beta-power evoked during reactive balance recovery may indicate reduced automaticity of balance correcting muscle activity, Neural Control of Movement Annual Meeting, Virtual, April 20-22 (**Poster**)
21. JA Palmer, AM Payne, LH Ting, and MR Borich (2021) Prefrontal-motor and somatosensory-motor cortical network interactions during reactive balance are associated with distinct aspects of balance behavior in older adults, Neural Control of Movement Annual Meeting, Virtual, April 20-22 (**Oral Presentation**)
22. JA Palmer, **AM Payne**, LH Ting, and MR Borich (2022) Faster cortical reactivity during nonparetic correction of balance destabilization associated with walking speed capacity post-stroke, American Physical Therapy Association Combined Sections Meeting, Neurology Section, San Antonio TX, February (**Poster**)
23. **AM Payne**, JL McKay, and LH Ting (2022) Distinct features of the cortical N1 response to balance perturbation are associated with balance and cognitive impairments in Parkinson's disease. International Society of Posture and Gait Research Conference, Montreal, Canada, July 3-7 (**Poster**)
24. SE Boebinger, **AM Payne**, NJ Ghosn, JL Mirdamadi, MR Borich, and LH Ting (2022) Greater cortical sensorimotor beta activity evoked during reactive balance recovery may indicate reduced automaticity of balance correcting muscle activity. International Society of Posture and Gait Research Conference, Montreal, Canada, July 3-7 (**Poster**)
25. KG Kerr, JL Mirdamadi, MR Borich, **AM Payne**, LH Ting, and SE Boebinger (2022) Cortical gamma activity is evoked during reactive balance control and increases with perturbation difficulty. International Society of Posture and Gait Research Conference, Montreal, Canada, July 3-7 (**Poster**)
26. JL Mirdamadi, JA Palmer, AM Payne, LH Ting, and MR Borich (2022) Different cortical oscillatory signatures during reactive balance are associated with distinct aspects of balance control post-stroke. American Society of Neurorehabilitation. St. Louis, USA, March 31-April 2 (**Poster**)
27. SE Boebinger, **AM Payne**, NJ Ghosn, JL Mirdamadi, MR Borich, and LH Ting (2022) Common sensory information encoding balance error drives evoked cortical and muscle activity during reactive balance. Neural Control of Movement Annual Meeting, Dublin, Ireland, July 25-29 (**submitted**)
28. JA Palmer, **AM Payne**, JL Mirdamadi, LH Ting, and MR Borich (2022) Perturbation-evoked cortical response speed during balance recovery biasing paretic and nonparetic lower limbs is associated with weight-bearing asymmetry and walking speed capacity post-stroke. Mobile Brain/Body Imaging Conference, San Diego, CA, USA, June 7-10 (**submitted**)

## INVITED SYMPOSIA

1. **AM Payne**, Perturbation-evoked cortical responses are associated with balance ability, Current evidence for cortical control of balance and gait, International Society of Posture and Gait Research, Virtual, December 3, 2020

## PROFESSIONAL ACTIVITIES & AFFILIATIONS

- |           |   |
|-----------|---|
| 2012-2014 | Membership Chair and Treasurer for <b>Out for Science, Technology, Engineering, and Mathematics (oSTEM)</b> |
| 2013-2014 | Co-founder and Co-President of <b>GTNeuro's Autism Committee</b>  |
| 2014-2018 | Membership in <b>Society for Neuroscience</b>   |

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2015-2021 Membership in **Neural Control of Movement**  
2016-2020 Membership in **American Psychopathological Association**  
2017-2021 Membership in **International Society of Posture and Gait Research**  
2017-2020 Membership in **Movement Disorders Society**  
2017 Participated in **Graduate Leadership Program** at Georgia Tech

#### **PEER REVIEWING**

2019- PLOS ONE  
2019- Journal of Neurophysiology  
2020- Frontiers  
2020- Annals of Clinical and Translational Neurology  
2021- Scientific Reports  
2021- BMC Geriatrics  
2022- Cerebral Cortex