

Audra Davidson

Curriculum Vitae

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EDUCATION

- 2012-2016 **B.S., Movement Science**, School of Kinesiology Honors Program
University of Michigan, Ann Arbor, MI
Grade Point Average: 3.93/4.00
Thesis Title: "Assessing activity in the home for prosthetic prescription"
Advisor: Dr. Deanna Gates
- 2020 **M.S., Biology**, School of Biological Sciences
Georgia Institute of Technology
Grade Point Average: 4.00/4.00
- 2016-Pres **Ph.D., Applied Physiology**, School of Biological Sciences
Georgia institute of Technology
Grade Point Average: 4.00/4.00
Advisor: Dr. Young-Hui Chang

RESEARCH EXPERIENCE

- 2014-2016 **Rehabilitation Biomechanics Laboratory**, University of Michigan
Undergraduate Research Assistant, Advisor: Dr. Deanna Gates
- PROJECTS:**
Thesis – Relationship between clinical assessments and everyday activity of patients with lower extremity limb loss
Effects of prosthetic design on the kinematics and metabolics of patients with lower extremity limb loss
Body-in-the-loop optimization of tuning parameters of a powered prosthetic ankle
Reliability of metabolic measures in healthy subjects
Formalizing standard operating procedures for laboratory equipment for future students
- 2016 **Biomechanics and Motor Control Laboratory**, Georgia Institute of Technology
Graduate Research Assistant, Advisor: Dr. Boris Prilutsky
- PROJECTS:**
Effects of nerve reinnervation on kinematics and kinetics of non-level walking
Locomotor function using a robotic prosthesis with restored cutaneous feedback

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2017-pres **Comparative Neuromechanics Laboratory**, Georgia Institute of Technology
Graduate Research Assistant, Advisor: Dr. Young-Hui Chang

PROJECTS:

Effects of timing of prosthetic power delivery on collisional and center of mass work

Relationship between motor performance and motor semantics of action words

Specificity of sensorimotor system involvement in semantic processing

Training with the sensorimotor system to enhance cognitive and physical outcomes

GRANTS AND FELLOWSHIPS

Paul A. Hunsicker Memorial Award, University of Michigan

Awarded to one undergraduate kinesiology student with superior scholarship and professional zeal and promise

Funding: \$1,000 in September 2014

President's Fellowship, Georgia Institute of Technology

Awarded to doctoral students with exemplary scholarship and innovation

Funding: \$5,500 per year for up to 3 years, starting August 2016

National Institute of Health T32 Training Fellowship, Georgia Institute of Technology

Awarded to promising students with research interests in prosthetics, orthotics, and rehabilitation

Funding: \$120,000 over 2 years, starting August 2016

Travel award, University of Connecticut

Awarded to exemplary students traveling to the Real World Language workshop

Funding: \$390 in July 2018

Travel award, National Science Policy Network

Awarded to students showing keen interest and promise in science policy

Funding: \$250 in November 2018

Science Communication Fellowship, Science ATL

Awarded to students with interest and promise in science communication

Funding: \$600 from August 2019 to February 2020

Science Communication and Inclusion Fellowship, Georgia Institute of Technology

Worked with the Department of Communications at the Georgia Tech College of Sciences to write articles highlighting Georgia Tech research efforts

PUBLICATIONS

1. **Davidson A**, Gardinier E, Gates D. Within and between-day reliability of energetic cost measures during treadmill walking. *Cogent Engineering*, 2016. 3(1).
2. **Davidson A**, Childers LW, Chang YH. Increasing push-off power from a prosthetic ankle may not reduce collisional work in the intact limb during gait. *Prosthetics and Orthotics International*. In review.

PRESENTATIONS

1. **Davidson A**, Felt W, Wensman J, Gardinier E, Gates D. Metabolic cost chances with the amount of prosthetic ankle power provided. American Society of Biomechanics Annual Meeting. Columbus, OH. August 6, 2015. Poster presentation.
2. **Davidson A**, Felt W, Wensman J, Gardinier E, Gates D. Metabolic cost chances with the amount of prosthetic ankle power provided. American Orthotics and Prosthetics Association National Meeting. San Antonio, TX. October 7, 2015. Poster showing.
3. **Davidson A**, Colabianchi N, Gates D. Assessing activity levels and community integration of people with lower extremity amputation. Honors thesis. University of Michigan, Ann Arbor, MI
4. **Davidson A**, Colabianchi N, Gates D. Assessing activity levels and community integration of people with lower extremity amputation. Annual Graduate Student Showcase. Ann Arbor, MI. April 12, 2016. Poster presentation.
5. Kim J, **Davidson A**, Gates D. Characterizing ambulatory tendencies for lower limb amputees. American Society of Biomechanics Annual Meeting. Boulder, CO. August 8, 2017. Poster presentation.
6. Walden NE, **Davidson A**, Childers L, Chang YH. The Effects of Prosthesis Push-Off Timing and Power on Energy Loss in the Contralateral Leg during Gait. American Academy of Prosthetists and Orthotists 44th Annual Meeting. New Orleans, LA. February 16, 2018. Poster presentation.
7. **Davidson A**, Walden NE, Chang YH. Increasing push-off energy from a prosthetic foot may not reduce energy losses in the contralateral leg during gait. American Society of Biomechanics Annual Meeting. August 10, 2018. Rochester, MN. Thematic poster presentation.
8. **Davidson A**, Walden NE, Chang YH. Increasing push-off energy from a prosthetic foot may not reduce energy losses in the contralateral leg during gait. Georgia Institute of Technology School of Biological Sciences retreat. August 25, 2018. Helen, GA. Poster presentation.
9. **Davidson A**, Spieler D, Chang YH. Grasping ideas with your hands: Neuromechanical assessment of the relation between cognitive processing and motor performance. International Society of Biomechanics Annual Meeting. July 31, 2019. Calgary, AB, Canada. Poster presentation.
10. Herrin K, Kwak ST, **Davidson A**, Berry M, Katragadda N, Chang YH. An automatic human-in-the-loop tuning algorithm for a robotic ankle prosthesis depends on an understanding of gait quality. American Society of Biomechanics Annual Meeting. August 6, 2020. Atlanta, GA. Poster presentation.

POPULAR SCIENCE WRITING

1. **Davidson A**. (2018, November). "When to Start Panicking About Killer Robots: How the Relationship Between Movement and Cognition is the Key to Advancing Artificial Intelligence," *Charged Magazine*. <http://chargedmagazine.org/2018/11/when-to-start-panicking-about-killer-robots/>
2. **Davidson A**. (2019, April). "If I Only Had a...Spine? Why the Spinal Cord is More Than Just A Cord," *Charged Magazine*. <http://chargedmagazine.org/2019/04/if-i-only-had-a-spine/>
3. **Davidson A**. (In review). "How Ink Evolved: The Science and Evolution of Permanent Body Art," *The Awesome Science of Everyday Life, Science ATL*.

ATTENDED WORKSHOPS

Communicating Science Conference, 2018 in Atlanta, GA

A selective interactive workshop for graduate students aiming to improve educate and empower

graduate students to effectively communicate their work to diverse audiences

Real-World language: Future directions in the science of communication and the communication of science, 2018 in Madison, WI

A workshop to discuss and assess the current state of language research and communicating scientific findings to the public

Science Policy Symposium, 2018 in New York City, NY

A symposium presented by the National Science Policy Network and the Science and Education Policy Association focused on science policy, advocacy and diplomacy

TECHNICAL SKILLS

Equipment and programs:

- Proficiency in Matlab, Adobe Illustrator, Microsoft Office software, Qualtrics, 3-D motion capture (Motion Analysis cameras, Vicon, Cortex, Visual 3D), electromyography equipment (Trigno Delsys wireless EMG, Noraxon), force measuring equipment (AMTI and Bertec force plates), metabolic equipment (Cosmed K4b², Polar heart rate monitors), activity monitoring equipment (Actigraph monitors, IMU devices, ArcGIS), and statistical analysis (IBM SPSS, Microsoft Office software) software and equipment.
- Experience with Cybex Isokinetic Dynamometer, Adobe InDesign, Adobe Lightroom, PsychoPy, Magstim Transcranial Magnetic Stimulation coil, Signal software.

Technical writing: Abstracts, technical notes, journal articles, letters of intent, study protocols, standard operating procedures, IRB applications, standard operating procedures, grant proposals, budget justifications.

Non-Technical writing: Magazine articles, journalism interviews.

TEACHING EXPERIENCE

2014	Teaching assistant School of Kinesiology, <u>Musculoskeletal Anatomy Laboratory</u> , University of Michigan, Ann Arbor, MI
2015	Classroom facilitator University Housing, <u>Making the Most of Michigan</u> , University of Michigan, Ann Arbor, MI
2015-2016	Study group leader School of Kinesiology, <u>Motor Control</u> , University of Michigan, Ann Arbor, MI
2017	Teaching assistant School of Biological Sciences, <u>Clinical Gait Analysis</u> , Georgia Institute of Technology, Atlanta, GA
2018, 2019	Teaching assistant School of Biological Sciences, <u>Anatomy Lab</u> , Georgia Institute of Technology, Atlanta, GA
2019	Teaching assistant School of Biological Sciences, <u>Biostatistics</u> , Georgia Institute of Technology, Atlanta, GA
2020	Teaching assistant School of Biological Sciences, <u>Physiology lab</u> , Georgia Institute of Technology, Atlanta, GA

COMMUNITY OUTREACH AND VOLUNTEER EXPERIENCE

- 2012 **Volunteer**, Department of Physical Therapy, The Ann Arbor VA Healthcare System, Ann Arbor, MI
- 2012 **Panel speaker**, Creating as a Way of Learning Symposium
- 2014 **Mentor**, Kinesiology Peer Mentorship Program
- 2015 **Anatomy and biomechanics instructor**, Females Excelling More in Math, Engineering, and the Sciences (FEMMES)
- 2015-2016 **Resident advisor**, University of Michigan Housing
- 2018 **Applied physiology outreach presenter**, Georgia Tech School of Biological Sciences research showcase
- 2018 **Applied physiology outreach presenter**, Institute for Robotics and Intelligent Machines symposium
- 2019 **Escape Labs: Creative team member and volunteer**, STEM-Communication, Atlanta Science Festival
- 2019 **Dog Days of Science: Organizer and event leader**, Exploration Expo, Atlanta Science Festival
- 2019 **“How Muscles Move Us” Demonstrator**, Hands On Future Tech
- 2020 **Event creator and team member**, Animals in Motion at Zoo Atlanta

LEADERSHIP AND PROFESSIONAL EXPERIENCE

Leadership Positions

- 2013 **Business manager**, The Sirens (A Cappella)
- 2014 **President**, The Sirens (A Cappella)
- 2018-Pres **President**, Promoting Applied Physiology Education and Research

Professional Organizations

- 2015 **Founding member**, Phi Epsilon Kappa Professional Kinesiology Fraternity
- 2013-2016 **Member**, Phi Kappa Phi Honors Society
- 2015-Pres **Member**, American Society of Biomechanics
- 2018-Pres **Member**, American Physiological Society
- 2018-Pres **Member**, American Association for the Advancement of Science

RECOGNITION

Academic Honors

- 2012-2016 University Honors awarded by the University of Michigan
- 2012 William J. Branstorm Freshman Prize awarded by the University of Michigan to the top 5% of the freshman class
- 2015, 2016 James B. Angel Scholar awarded by the University of Michigan to students with two or more consecutive A terms
- 2015 Phi Kappa Phi Honors Society awarded to the top 7.5% of junior undergraduates

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- 2018 Honorable mention for Graduate Research Fellowship awarded by the National Science Foundation
- 2018 Best student poster presentation runner up, awarded by the School of Biological Sciences based on audience votes at the School of Biological Sciences retreat
- 2020 Best College of Sciences poster and presentation awarded by the Career, Research, and Innovation Development Conference judges. Awarded \$1,500 in travel funds

Awards

- 2012 Creating as a Way of Learning awarded by the University of Michigan to students using artistic creativity in course work
- 2015 Paul A. Hunsicker Memorial Award awarded by the University of Michigan to one graduate and one undergraduate kinesiology student with superior scholarship and professional zeal and promise