Mia E. Hoffman

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Education

University of Washington — Seattle, WA
PhD Candidate, Mechanical Engineering — 2021 – 2026
Faculty Advisors: Drs. Kat Steele and Heather Feldner
Thesis: Mobility and accessible play technologies for young children

Graduate Certificate in Disability Studies — 2023 - Present

MS, Mechanical Engineering — 2021 – 2023

University of Notre Dame — Notre Dame, IN
BS, Mechanical Engineering
Minor: Bioengineering — 2021
Faculty Advisor: Dr. Maria Holland
Undergraduate thesis: Computational study on the mechanics of growth and brain folding of non-human primate brains

Research Experience

University of Washington, Neuromechanics & Mobility Lab | IMPACT Collaboratory — 2021 – Present
Advisors: Katherine M. Steele & Heather A. Feldner
Quantifying young children's interactions with mobility aids, including modified ride-on cars, Permobil Explorer Mini, and an open-area partial bodyweight support system, in both laboratory and community settings
Co-designed and evaluated a switch-accessible play kit for young children with complex medical needs in collaboration with local families and early intervention providers

University of Notre Dame, CoMMaND Lab — 2018 – 2021
Advisor: Maria Holland | Undergraduate Research Assistant
Applied computational mechanics techniques to investigate how cortical thickness influences brain folding in non-human primates

University of Minnesota, Auditory Perception & Cognition Lab — Summer 2019
Advisor: Andrew Oxenham | NSF Neuroimaging REU Intern
Developed an experimental interface and assisted with fMRI data analysis to identify pitch sensitive regions of the brain in response to tonal stimuli

University of Rochester, Carney Lab — Summer 2018
Advisor: Laurel H. Carney | NSF REU Intern, Advancing Human Health, From Nano to Network
Designed and conducted a pilot study with human participants to examine the effect of precursor noise on the efferent auditory system

Nationwide Children's Hospital, Battelle Center for Mathematical Medicine — Summer 2016
Advisor: William C. Ray | Future Matters Program Intern
Employed clustering algorithms to identify protein subsets from urine samples as potential diagnostic markers for preeclampsia

Publications

Peer-reviewed Journal Papers

P10. **Hoffman, ME.,** K Bokowy, A Bose, T Li, HA Feldner, KM Steele. "Low-cost accessible Switch Kit for age-appropriate play in early intervention: A technical report." *In preparation.*

P9. **Hoffman, ME.**, R Abuatiq, K Bokowy, AL Fiss, J Looper, KM Steele, HA Feldner. "Up and Down: Analysing physical activity and posture with wearable sensors during partial bodyweight supported play for young children with Down syndrome." *Under review.*

P8. **Hoffman, ME.,** BM Sloane, SW Logan, LK Kenyon, HA Feldner. "Comparison of three tracking methods to assess usage of two pediatric powered mobility devices for young children with cerebral palsy." *Under review.*

P7. **Hoffman, ME.**, E. Koolman, HA Feldner. "A systematic review of disability representation in engineering design education." *Under review.*

P6. Ingraham, KA, NL Zaino, C Feddema, **ME Hoffman**, L Gijbels, A Sinclair, AN Meltzoff, PK Kuhl, HA Feldner, KM Steele. "Quantifying joystick interactions and movement patterns of toddlers with disabilities using powered mobility with an instrumented Explorer Mini." IEEE Transactions on Neural Systems and Rehabilitation Engineering. 2025. 10.1109/TNSRE.2025.3528454

P5. Zaino, NL, K Ingraham, **ME Hoffman**, HA Feldner, KM Steele. "Quantifying toddler exploration in seated and standing postures with powered mobility." Assistive Technology. 2024. 10.1080/10400435.2024.2400463

P4. Abuatiq, RA, **ME Hoffman**, AL Fiss, J Looper, HA Feldner. "Exploring the efficacy of a dynamic harness system on gross motor development and motivation for infants With Down syndrome: A pilot study." Pediatric Physical Therapy. 2024. 10.1097/PEP.0000000000001130

P3. **Hoffman, Mia E.**, KM Steele, JE Froehlich, KN Winfree, and HA Feldner. "Off to the park: A geospatial investigation of ride-on car usage." Disability & Rehabilitation: Assistive Technology. 2024. 10.1080/17483107.2023.2248218

P2. (undergraduate research) Demirci, N, **ME Hoffman**, and MA Holland. "Systematic cortical thickness patterns and curvature patterns in primates." Neuroimage. 2023. 10.1080/17483107.2023.2248218

P1. (undergraduate research) Darayi, M, **ME Hoffman**, J Sayut, S Wang, N Demirci, Jack Consolini, and MA Holland. 2021. "Computational models of cortical folding: A review of common approaches." *Journal of Biomechanics.* 2021. 10.1016/j.jbiomech.2021.110851.

Conference Papers

CP4. **Student Scientific Paper Competition Winner: Hoffman, ME**, R Bernas, A Bose, K Bokowy, HA Feldner, KM Steele. "Measuring Early Intervention Provider's Use of a Novel Switch-accessible Play Kit." Rehabilitation Engineering Society of North America (RESNA), May 12, 2025, Chicago, IL.

CP3. Koolman, E, **ME Hoffman**, A Schauer, "Review of terminology used in course-based engineering design for disability research." *ASEE 2025*, Montreal, 2025.

CP2. **Student Scientific Paper Competition Winner: Hoffman, ME**, Sloane B, Fragomeni A, Steele KM, Feldner HA. "Exploring the World on Wheels: A Geospatial Comparison of Two Pediatric Mobility Devices". Rehabilitation Engineering Society of North America (RESNA), July 24- 26, 2023, New Orleans, LA.

CP1. **Hoffman, ME.**, KM Steele, KN Winfree, and HA. Feldner. "The Impact of the Built Environment on Early Power Mobility Access." UrbanAccess'22 Workshop at ASSETS. https://accessiblecities.github.io/UrbanAccess2022/#accepted-papers

Grants & Funding

National Institute of Health INCLUDE TL1 Fellow 2024 – 2027

Provides three years of financial support for a graduate research assistantship and research expenses
Supports investigation into young children with Down syndrome's initial interactions with mobility aids

CREATE Translation Grant January 2024

Awarded $10,000 to advance the development and evaluation of the Switch Kit, an accessible play kit for young children receiving early intervention

CREATE Student Minigrant February 2023

Awarded $250 for the development of a modular datalogger for use with modified ride-on cars

National Science Foundation Graduate Research Fellow Link 2021 – 2024

Five-year fellowship awarded to top graduate student applicants in NSF-supported STEM fields
Includes three years of financial support through a stipend and tuition waiver

Presentations

Conference Symposium Presentations

3. **ME Hoffman** and BM Sloane. "Reimagining Mobility Aids: Collaborative Innovations Between Engineering and Physical Therapy." APTA Pediatrics Annual Conference, October 31-November 2, 2025.
2. **ME Hoffman** and S Westlake. "Switch It Up: From Adapted Toys to Therapeutic Gaming." Rehabilitation Engineering Society of North America (RESNA), May 12, 2025.

1. **Hoffman, ME**. HA Feldner, T Li. "Co-Designing a Switch Accessible Digital Play Environment for Children in Partnership with Clinicians and Families." 2025 APTA Combined Sections Meeting (CSM), February 2025, Houston, TX.

Podium Presentations

10. **Hoffman, ME**, R Bernas, A Bose, K Bokowy, HA Feldner, KM Steele. "Measuring Early Intervention Provider's Use of a Novel Switch-accessible Play Kit." Rehabilitation Engineering Society of North America (RESNA), May 12, 2025, Chicago, IL.
9. **Hoffman, ME.** "Co-designing Switch Accessible Play for Young Children Receiving Early Intervention." Justys F. Lehmann Symposium, June 10, 2024, Seattle, WA.
8. **Hoffman, ME.**, Sloane B, Fragomeni A, Steele KM, Kenyon LK, Logan SW, Feldner HA. "A Comparison of Methods for Assessing Young Children's Mobility Device Use in Real-world Settings." Northwest Biomechanics Symposium, May 17-18, 2024, Eugene, OR.
7. Looper JE, Fiss, A, Abuatiq, R., **Hoffman, ME**., Feldner, H.A. "Dynamic Supported Play Environments to Encourage Mobility and Exploration in Toddlers with Down Syndrome". 2024 APTA Combined Sections Meeting (CSM), February, 2024, Boston, MA.
6. Abuatiq, R., **Hoffman, ME**., Fiss, A., Looper, J., Feldner, H.A. "Exploring the Benefits of a Dynamic Harness System Using Partial Body Weight Support on Gross Motor Development for Infants with Down Syndrome". Academy of Pediatric Physical Therapy Annual Conference, October 28, 2023, Omaha, NE.
5. **Hoffman, ME.**, Abuatiq R., Fiss AL., Looper J., Steele KM., Feldner HA. "Quantifying the Activity Levels of Toddlers with Down Syndrome Playing in a Partial Body Weight Support System". American Academy for Cerebral Palsy and Developmental Medicine (AACPDM), September 10-13, 2023, Chicago, IL.
4. **Hoffman, ME.**, Sloane B., Fragomeni A., Steele KM., Feldner HA. "Exploring the World on Wheels: A Geospatial Comparison of Two Pediatric Mobility Devices". Rehabilitation Engineering Society of North America (RESNA), July 24-26, 2023, New Orleans, LA.
3. **Hoffman, ME.,** Steele KM., Winfree KN., Feldner HA. "Why Can't I go to the Park?" A Geospatial Analysis of How the Built Environment Impacts Adapted Ride-on Car Use". International Seating Symposium, April 13-15, 2023, Pittsburgh, PA.
2. **Hoffman, ME.**, Steele KM., Winfree KN., Feldner HA. "A Geospatial Investigation of Adapted Ride-on Car Usage and the Lived Environment". Justys F. Lehmann Symposium, June 2, 2022, Seattle, WA.
1. **Hoffman, ME.**, Holland, MA. "Analyzing the Cortical Thickness of the Primate Brain using Magnetic Resonance Imaging". WE20, November 2-13, 2020, Virtual Meeting.

Invited Presentations

8 **Hoffman, ME.** Mobility Aids for Young Children with Down Syndrome. Kindering Redmond, July 2025, Redmond, WA.

7 **Hoffman, ME.** Mobility Aids for Young Children with Down Syndrome. Holly Ridge Center, April 2025, Bremerton, WA.

6 **Hoffman, ME.** Mobility Aids for Young Children with Down Syndrome. Waypoint Pediatric Therapies, April 2025, Issaquah, WA.

5 **Hoffman, ME.** Mobility Aids for Young Children with Down Syndrome. First Steps Pediatric Therapy, April 2025, Kirkland, WA.

4 **Hoffman, ME.** Using the Switch Kit in Early Intervention. Kindering Redmond, May 2024, Redmond, WA.

3 **Hoffman, ME.** Using the Switch Kit in Early Intervention. Boyer Children's Clinic, August 2024, Seattle, WA.

2 **Hoffman, ME.** Development of the Switch Kit. Kindering Bothell, August 2023, Bothell, WA.

1 **Hoffman, ME.** "Digital Play for Young Kids with Disabilities." Meta Day, November 2022, University of Washington, Seattle, WA.

Mentoring

Doctoral Students

Elisa Koolman (3rd year Ph.D. Student, UT Austin)
Disability studies scholarship in engineering education

Ally Clarke (2nd year Ph.D. Student, Mechanical Engineering)
Development of FrakenCap – an open-source toolkit for upper-body tracking

Shariphine Agoalikum (2nd year Ph.D. Student, Rehabilitation Medicine)

Relation between Gross Motor Function and exploration for young children with developmental delay and disabilities

DPT Students

Aislinn Knight (2024 – 2026)
Caregivers perspectives on the use of mobility aids by non-ambulatory children with Down syndrome

Tiffany Li (2023 – 2025)
Caregiver and clinicians perspectives during the co-design of the Switch Kit

Undergraduates

Spencer Hensley (2025 – Present)
Changes in muscle activation patterns during young children's use of mobility aids

Katie Leija (2025 – Present)
Using motion capture to track young children's use of mobility aids

Neha Arunkumar (2024 – Present)
Accessible design leader and student chair in HuskyADAPT
Mary Gates Leadership Scholarship

Alisha Bose (2024 – Present)
Development and evaluation of the Switch Kit
Mary Gates Research Fellowship

Riley Bernas (Summer 2024)
Development of a method to track Switch Kit use in Scratch
2024 UW Center for Neurotechnology Research Experience for Undergraduates

Kate Bokowy (2023 – 2025, Department of Mechanical Engineering Outstanding Research Award)
Development and evaluation of the Switch Kit
Researching how posture can be identified from a wearable sensor

Teaching

Teaching Assistant, University of Washington, Seattle, WA — Fall 2024 & Fall 2025
Course: Introduction to Design Process (130 – 150 students)
Duties:
Develop material and lead design studio sections
Provide feedback on designs and design processes both in person and through graded coursework
Collaborated with lead instructor to integrate inclusive design and an equity lens analysis into coursework

Course Co-Instructor, University of Washington, Seattle, WA — Sp 2023
Course: Human Engineering Graduate Seminar
Duties:
Co-developed course structure and weekly content
Coordinated student-led discussions on journal articles and assistive technology topics
Facilitated engagement and critical analysis of current research in human engineering

Mechanical Engineering Capstone Team Advisor, University of Washington, Seattle, WA — Wi & Sp 2023
Served as a primary mentor for two 2-semester-long senior capstone teams
Weekly advising meetings with teams to provide feedback and guidance

Bioengineering & Mechanical Engineering Capstone Team Advisor, University of Washington, Seattle, WA — Wi & Sp 2022
Served as a mentor for a 2-semester-long, interdisciplinary senior capstone team
Weekly advising meetings with teams to provide feedback and guidance
Direct communications with family and early intervention clinic clients

Teaching Assistant, University of Notre Dame, Notre Dame, IN — Spring 2021
Course: Intro to Electrical Engineering and Embedded Systems (120 students)
Duties:
Lead experimental physical computing lab sessions
Grade all assignments and exams

Guest Lectures

Frameworks for Accessible Design, ME 493, University of Washington, Seattle, WA — Nov 2024
Intro to Accessible Design, BIOEN 215, University of Washington, Seattle, WA — Nov 2023
Accessible Technology for Play, University Seminar, Oregon Health and Science University, Virtual. — Oct 2022

Honors & Awards

NextProf Nexus Workshop, USC Santa Barbara — September 2025
Dennis Lang Award in Disability Studies, University of Washington — May 2025
Awarded annually by UW's Disability Studies Program to undergraduate and graduate students who demonstrate academic excellence in disability studies and a commitment to disability-related social justice issues
RESNA Student Scientific Paper Competition Winner, 1st Place — May 2025
ITHS TL1 Training Program, University of Washington — 2024 – 2025
RESNA Student Scientific Paper Competition Winner — May 2023
NWBS Honorable Mention for Best Poster — May 2023
NextProf Pathfinder Workshop, USC San Diego — October 2022
Ron and Wanda Fellowship in Mechanical Engineering, University of Washington — 2021 – 2022
Bioengineering Outstanding Undergraduate Researcher Award, University of Notre Dame — April 2021
Sorin Fellow, University of Notre Dame — 2018 – 2021
Dean's Citation for Broadening Participation in Research, University of Rochester — August 2018
Glenna R. Joyce Scholarship, University of Notre Dame — 2017 – 2021
Four-year merit scholarship for full tuition and boarding at the University of Notre Dame awarded to three students annually

Service & Outreach

HuskyADAPT Student Executive Chair, UW, Seattle, WA — 2023-2025
Led a student organization providing assistive technology and educational workshops to the local community, including switch-adapted toys, custom design projects, low-cost switches, and adapted books
HuskyADAPT Design Chair, UW, Seattle, WA — 2022-2023
Mentored 36 students on year-long design projects with local community organizations
Facilitated weekly workshops on design thinking and technical skills
NextProf Pathfinder Mentor, UM, Ann Arbor, MI — 2023
Served as a peer mentor for PhD students attending the NextProf Pathfinder workshop
Mechanical Engineering Graduate Student Association Social Chair, UW, Seattle, WA — 2022-2023
Organized social events (e.g., happy hours, non-alcohol based get-togethers, holiday celebrations, lunches focused on affinity groups) to foster community among graduate students, faculty, and administration
GoBabyGo Volunteer, UW, Seattle, WA — 2021 – Present
Collaborated with families and clinicians to modify ride-on cars for children with disabilities
Secured funding to develop standardize toolkits to streamline the build process
Enable ND President, ND, Notre Dame, IN — 2020 – 2021
Led a student club focused on designing and manufacturing open-source, 3D printable assistive technology
Secured funding and resources to support design initiatives and expand club's impact
Enable ND Vice-President, ND, Notre Dame, IN — 2019 – 2020
Established Enable ND as an official club at Notre Dame and created connections with the larger disability community
Enable ND Director of Research & Development, ND, Notre Dame, IN — 2018 – 2019
Mentored design teams developing assistive technology for the local community
Society of Women Engineers Director of Diversity, ND, Notre Dame, IN — 2019 – 2020
Planned events focused on affinity groups and organized DEI-focused programming for members
Society of Women Engineers Director of Outreach — 2018 - 2019
Organized STEM outreach events (e.g., Girl Scout Day, Women in Engineering basketball game) to engage local girls in engineering