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Stephanie Hernandez Hernandez, Ph.D.

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Professional Profile

Dr. Hernandez is an expert in the field of biomechanics and human motor learning, including the analysis of human movement, human mechanics, motor control, and rehabilitation strategies. She has extensive experience conducting human subject studies with both healthy and impaired individuals, designing experimental protocols to study motor skill acquisition using custom-built robotic systems, and conducting data analyses to derive clinically relevant insights. Her work also includes analyses of human kinematics and injury mechanics related to motor vehicle, premises, workplace and recreational incidents.

Dr. Hernandez earned her Ph.D. in Mechanical Engineering from the University of Wisconsin–Madison, where she conducted research in the Biomechanics, Assistive Devices, Gait Engineering & Rehabilitation (BADGER) Lab. Her doctoral work focused on understanding principles of motor learning in the lower extremities using robot-driven perturbations and virtual task environments. Throughout her graduate studies, she gained extensive experience in designing complex human subject experiments, developing interactive study environments using Python and Unity, controlling robotic systems, and conducting sophisticated data analyses in MATLAB, and R. Her work included a clinical case study with a stroke survivor and the development of study protocols tailored to populations with motor impairments.

Prior to her graduate training, Dr. Hernandez studied at the University of Puerto Rico–Mayagüez, where she held two co-op positions in the medical device industry, gaining hands-on experience with manufacturing validation, process development, regulatory compliance, and integration of new devices into production environments. She simultaneously conducted research across biomechanics, biomaterials, and microfluidics, characterizing mechanical and tribological properties of biomaterials, analyzing bio-microfluidic particle behavior, and studying metabolic energy consumption while walking under varying torso lean conditions.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, University of Wisconsin, Madison, 2025

M.S., Mechanical Engineering, University of Wisconsin, Madison, 2022

B.S., Mechanical Engineering, University of Puerto Rico, Mayagüez (UPRM), 2020

Graduate Engineering Research Fellow, UW-Madison

Hispanic Engineer National Achievement Awards Corporation Scholar 2019 & 2018

Puerto Rico Louis Stokes Alliance for Minority Participation - Undergraduate Research Scholar

Academic Appointments

Teaching Assistant, Kinesiology, University of Wisconsin–Madison, 2024

Prior Experience

Graduate Research Assistant, University of Wisconsin–Madison Biomechatronics, Assistive Devices, Gait Engineering & Rehabilitation Lab, 2020-2025

Manufacturing Engineering Co-op, Boston Scientific, 2019

Process Engineer Co-op, Ethicon (Johnson & Johnson), 2018-2019

Undergraduate Research Assistant, Mechanical Engineering, University of Puerto Rico – Mayagüez, 2016-2018

Undergraduate Research Assistant, University of Wisconsin–Madison Biomechatronics, Assistive Devices, Gait Engineering & Rehabilitation Lab, 2018

Undergraduate Research Assistant, Syracuse University, Syracuse Biomaterial Institute, 2017

Languages

Spanish

Publications

Hernández-Hernández SB, Leech KA, Adamczyk PG. Motor learning of a novel dynamic coordination task in the lower-limb of young healthy adults. Human Movement Science 2026; 105:103433.

Roembke RA, **Hernández-Hernández SB**, Adamczyk PG. Mechanical and metabolic consequences of sagittal trunk lean angle in walking–a dynamic walking perspective. Journal of Experimental Biology 2025; 228(17):jeb250146.

Presentations

Hernández-Hernández SB, Adamczyk PG. Understanding motor learning principles in the lower limbs using a haptic robot (NOTTABIKE). Oral Presentation, University of Puerto Rico - Mayagüez Mechanical Engineering Graduate Seminar (Virtual), 2025.

Adamczyk PG, **Hernández-Hernández SB**, Fehr KH, Wang Y. Wearable sensors and robotic motor control experiments in the UW BADGER Lab. Oral Presentation, American Telemedicine Association, Telerehab Special Interest Group (Virtual), 2025.

Hernández-Hernández SB, Adamczyk PG. Reinforcement learning as a tool for lower limb motor learning: Insights and outcomes. Poster Presentation, American Society of Biomechanics, Pittsburgh, PA, USA, 2025.

Hernández-Hernández SB, Adamczyk PG. The effect of motor exploration on lower limb reinforcement learning. Poster Presentation, Society for the Advancement of Chicanos/Hispanics and Native Americans in Science, Phoenix, AZ, USA, 2024.

Hernández-Hernández SB, Leech KA, Adamczyk PG. The dynamics of motor learning in a novel lower-limb task. Poster Presentation, American Society of Biomechanics, Madison, WI, USA, 2024.

Hernández-Hernández SB, Adamczyk PG. Understanding motor adaptation in dominant vs non-dominant

lower limb. Poster Presentation, American Society of Biomechanics, Knoxville, TN, USA, 2023.

Hernández-Hernández SB, Adamczyk PG. Understanding lower limb motor control on young adults and stroke survivors. Poster Presentation, Progress in Clinical Motor Control, Chicago, IL, USA, 2023.

Dawson-Elli A, **Hernández-Hernández SB**, Adamczyk PG. Lower-limb motor adaptation during a haptic robot reaching task. Poster Presentation, North American Congress on Biomechanics, Ottawa, ON, Canada, 2022.

Dawson-Elli A, **Hernández-Hernández SB**, Adamczyk PG. Lower-limb motor adaptation during a haptic robot reaching task. Oral Presentation, Dynamic Walking, Madison, WI, USA, 2022.

Dawson-Elli A, **Hernández-Hernández SB**, Adamczyk PG. Lower-limb motor adaptation during a haptic robot reaching task. Poster Presentation, Dynamic Walking, Madison, WI, USA, 2022.

Dawson-Elli A, **Hernández-Hernández SB**, Adamczyk PG. Lower-limb motor adaptation during a haptic robot reaching task. Poster Presentation, Movement and Rehabilitation Sciences Research Day, Chicago, IL, USA, 2021.