

MANUEL ENRIQUE HERNANDEZ

CURRICULUM VITAE

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EDUCATION

Ph.D., Biomedical Engineering, University of Michigan, Ann Arbor, 2012

Dissertation: Biomechanics of leaning and downward reaching tasks in young and older women

M.S., Biomedical Engineering (Biomechanics Concentration), University of Michigan, Ann Arbor, 2005

B.S., Mechanical Engineering, Cornell University, 2003

ACADEMIC APPOINTMENTS

University of Illinois at Urbana-Champaign, Urbana-Champaign, IL *2020-Present*
Affiliate Faculty, Informatics

University of Illinois at Urbana-Champaign, Urbana-Champaign, IL *2018-Present*
Affiliate Faculty, Computational Science and Engineering

University of Illinois at Urbana-Champaign, Urbana-Champaign, IL *2017-Present*
Affiliate Faculty, Department of Psychology
Assistant Professor, Biomedical and Translational Sciences, Carle Illinois College of Medicine

University of Illinois at Urbana-Champaign, Urbana-Champaign, IL *2014-Present*
Assistant Professor, Department of Kinesiology and Community Health
Affiliate Faculty, Beckman Institute for Advanced Science and Technology
Affiliate Faculty, Center on Health, Aging and Disability
Faculty, Neuroscience Program

University of California, San Diego, La Jolla, CA *2012-2014*
Postdoctoral Scholar, Institute for Neural Computation

TEACHING INTERESTS

Biomechanics of human movement • Fall prevention • Motor control • Neuromechanics
Neurorehabilitation • Occupational and rehabilitation biomechanics • Problem-based learning

RESEARCH INTERESTS

Investigation of risk factors for injury or disability during the performance of goal-directed movements • Age-related and disease-related changes in postural control • Behavioral and neural mechanisms underlying postural and gait dysfunction in older adults with and without neurological disorders • Non-linear dynamical analysis of short and noisy time series data

PEER-REVIEWED JOURNAL PUBLICATIONS

1. Goldberg, A., **Hernandez, M. E.**, & Alexander, N. B. (2005). Trunk repositioning errors are increased in balance-impaired older adults. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, 60(10), 1310–1314.
2. **Hernandez, M. E.**, Murphy, S. L., & Alexander, N. B. (2008). Characteristics of older adults with self-reported stooping, crouching, or kneeling difficulty. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, 63(7), 759–763.
3. **Hernandez, M. E.**, Goldberg, A., & Alexander, N. B. (2010). Decreased muscle strength relates to self-reported stooping, crouching, or kneeling difficulty in older adults. *Physical Therapy*, 90(1), 67–74.
4. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2012). Age-related changes in speed and accuracy during rapid targeted center of pressure movements near the posterior limit of the base of support. *Clinical Biomechanics (Bristol, Avon)*, 27(9), 910–916.
5. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2012). The effect of age, movement direction, and target size on the maximum speed of targeted COP movements in healthy women. *Human Movement Science*, 31(5), 1213–1223.
6. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2013). Age-related differences in maintenance of balance during forward reach to the floor. *The Journals of Gerontology: Biological Sciences and Medical Sciences*, 68(8), 960-967.
7. Lukos, J. R., Snider, J., **Hernandez, M. E.**, Tunik, E., Hillyard, S., & Poizner, H. (2013). Parkinson's disease patients show impaired corrective response control and eye-hand coupling when reaching to virtual objects. *Neuroscience*, 254, 205-21. <https://doi.org/10.1016/j.neuroscience.2013.09.026>
8. Lainscsek, C., Weyhenmeyer, J., **Hernandez, M. E.**, Poizner, H., & Sejnowski, T. J. (2013). Non-linear dynamical classification of short time series of the Rössler system in high noise regimes. *Frontiers in Neurology*, 4, 182. <https://doi.org/10.3389/fneur.2013.00182>
9. Lainscsek, C., **Hernandez, M. E.**, Weyhenmeyer, J., Sejnowski, T. J., & Poizner, H. (2013). Non-linear dynamical analysis of EEG time series distinguishes patients with Parkinson's disease from healthy individuals. *Frontiers in Neurology*, 4, 200. <https://doi.org/10.3389/fneur.2013.00200>

10. Lainscsek, C., **Hernandez, M. E.**, Poizner, H., & Sejnowski, T. J. (2015). Delay Differential Analysis of Electroencephalographic Data. *Neural Computation*, 27(3), 615-627. https://doi.org/10.1162/NECO_a_00656
11. **Hernandez, M. E.**, Snider, J., Stevenson, C., Cauwenberghs, G., & Poizner, H. (2015). A correlation-based framework for evaluating postural control stochastic dynamics. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 24(5), 551-561. <https://doi.org/10.1109/TNSRE.2015.2436344>
12. Moon, Y., Sung, J., An, R., **Hernandez, M. E.**, & Sosnoff, J. J. (2016). Gait Variability in People with Neurological Disorders: A Systematic Review and Meta-analysis. *Human Movement Science*, 47, 197-208. <https://doi.org/10.1016/j.humov.2016.03.010>
13. **Hernandez, M. E.**, Holtzer, R., Chaparro, G., Jean, K., Balto, J. M., Sandroff, B. M., Izzetoglu, M., & Motl, R. W. (2016). Brain activation changes during locomotion in middle-aged to older adults with multiple sclerosis. *Journal of the Neurological Sciences*, 370, 277-283. <https://doi.org/10.1016/j.jns.2016.10.002>
14. Bollaert, R. E., Balto, J. M., Sandroff, B. M., Chaparro, G., **Hernandez, M. E.**, & Motl, R. W. (2017). Preliminary evidence for the effects of aging and multiple sclerosis on cognitive performance: an analysis based on effect size estimates. *Experimental Aging Research*, 43(4), 346-354. <https://doi.org/10.1080/0361073X.2017.1333820>
15. Chaparro, G., Balto, J. M., Sandroff, B. M., Holtzer, R., Izzetoglu, M., Motl, R. W., & **Hernandez, M. E.** (2017). Frontal brain activation changes due to dual-tasking under partial body weight support conditions in older adults with multiple sclerosis. *Journal of NeuroEngineering and Rehabilitation*, 14(1), 65. <https://doi.org/10.1186/s12984-017-0280-8>
16. Sandroff, B. M., **Hernandez, M. E.**, Holtzer, R., Izzetoglu, M., & Motl, R. W. (2017). Examining the patterns of prefrontal cortex activation during performance of an executive function task in persons with multiple sclerosis using functional near-infrared spectroscopy. *Current Trends in Neurology*, 11, 31-40.
17. Motl, R. W., Chaparro, G., **Hernandez, M. E.**, Balto, J. M., & Sandroff, B. M. (2018). Physical function in older adults with multiple sclerosis: an application of the short physical performance battery. *Journal of Geriatric Physical Therapy*, 41(3), 155-160. <https://doi.org/10.1519/JPT.0000000000000115>
18. Chaparro, G. N., Stine-Morrow, E. A. L., & **Hernandez, M. E.** (2019). Effects of aerobic fitness on cognitive performance as a function of dual-task demands in older adults. *Experimental Gerontology*, 118, 99-105. <https://doi.org/10.1016/j.exger.2019.01.013>
19. **Hernandez, M. E.**, O'Donnell, E., Chaparro, G., Holtzer, R., Izzetoglu, M., Sandroff, B. M., & Motl, R. W. (2019). Brain activation changes during balance and attention demanding tasks in middle and older aged adults with multiple sclerosis. *Motor Control*, 23(4), 498–517. <https://doi.org/10.1123/mc.2018-0044>
20. Tablerion, J. M., Wood, T. A., Hsieh, K. L., Bishnoi, A., Sun, R., **Hernandez, M. E.**, An, R., & Sosnoff, J. J. (2020). Motor learning in people with multiple sclerosis: a systematic review and meta-analysis. *Archives of Physical Medicine and Rehabilitation*, 101(3), 512-523. <https://doi.org/10.1016/j.apmr.2019.09.014>

21. Chaparro, G. N., Sosnoff, J. J., & **Hernandez, M. E.** (2020). Effects of aerobic fitness on cognitive motor interference during self-paced treadmill walking in older adults. *Aging Clinical and Experimental Research*, 32(12), 2539-2547. <https://doi.org/10.1007/s40520-020-01479-2>
22. Wood, T. A., **Hernandez, M. E.**, & Sosnoff, J. J. (2020). Age-related differences to neck muscle activation latency as a potential risk factor to fall-related traumatic brain injuries. *Journal of Electromyography and Kinesiology*, 51(2020), 102405. <https://doi.org/10.1016/j.jelekin.2020.102405>
23. Hua, A., Johnson, N., Quinton, J., Chaudhary, P., Buchner, D., & **Hernandez, M. E.** (2020). Design of a low-cost, wearable device for kinematic analysis in physical therapy settings. *Methods of Information in Medicine*, 59(01), 041-047. <https://doi.org/10.1055/s-0040-1710380>
24. Hua, A., Chaudhari, P., Johnson, N., Quinton, J., Schatz, B., Buchner, D., & **Hernandez, M. E.** (2020). Evaluation of machine learning models for classifying upper extremity exercises using inertial measurement unit-based kinematic data. *IEEE Journal of Biomedical and Health Informatics*, 24(9), 2452-2460. <https://doi.org/10.1109/JBHI.2020.2999902>
25. Chaparro, G. N., Motl, R. W., & **Hernandez, M. E.** (2020). Effects of partial body weight support on dual-task walking in older adults with multiple sclerosis. *Journal of Kinesiology and Wellness*, 9(1), 18-28.
26. Harrigan, T. P., Hwang, B. J., Mathur, A. K., Mills, K. A., Pantelyat, A. Y., Bang, J. A., Syed, A., Vyas, P., Martin, S., Jamal, A., Ziegelman, L., **Hernandez, M. E.**, Wong, D., & Brašić, J. (2020). Dataset of quantitative structured office measurements of movements in the extremities. *Data in Brief*, 31, 105876. <https://doi.org/10.1016/j.dib.2020.105876>
27. Bishnoi, A., & **Hernandez, M. E.** (2020). Dual task walking costs in older adults with mild cognitive impairment: a systematic review and meta-analysis. *Aging & Mental Health*, 1-12. <https://doi.org/10.1080/13607863.2020.1802576>
28. Zanutto, T., **Hernandez, M. E.**, Medrano, C. N., Wilund, K. R., & Sosnoff, J. J. (2020). Cardiac autonomic dysfunction and falls in people with multiple sclerosis: is there a link? An Opinion Article. *Frontiers in Neuroscience*, 14, 1299. <https://doi.org/10.3389/fnins.2020.610917>
29. Hu, Y., Kattan, C., Kontos, D., Zhu, W., & **Hernandez, M. E.** (2021). Benefit of Tai Chi Quan Practice on Neuromuscular Functions in Older Adults. A Systematic Review and Meta-analysis. *Complementary Therapies in Clinical Practice*, 42, 101295. <https://doi.org/10.1016/j.ctcp.2020.101295>
30. Bishnoi, A., Holtzer, R., & **Hernandez, M. E.** (2021). Brain activation changes while walking in adults with and without neurological disease: Systematic Review and Meta-analysis of Functional Near-Infrared Spectroscopy. *Brain Sciences*, 11, 291. <https://doi.org/10.3390/brainsci11030291>
31. Kaur, R., Chen, Z., Motl, R., **Hernandez, M. E.**, & Sowers, R. (In press). Predicting Multiple Sclerosis from Gait Dynamics Using an Instrumented Treadmill - A Machine Learning Approach. *IEEE Transactions on Biomedical Engineering*. <https://doi.org/10.1109/TBME.2020.3048142>

PEER-REVIEWED FULL LENGTH CONFERENCE PROCEEDINGS

32. **Hernandez, M. E.**, Xiang, X., Park, Y. E., Goenawan, I., Yawson, F., & Lowe, E. (2011). Implementation of an Integrated Product Development Competition in a Rural Dominican Community: Lessons Learned. *Proceedings of the 118th Annual Meeting of the American Society for Engineering Education*, AC 2011-1102.
33. **Hernandez, M. E.**, Stevenson, C., Snider, J., & Poizner, H. (2013). Center of pressure velocity autocorrelation as a new measure of postural control during quiet stance. *Proceedings of the 2013 6th International IEEE/EMBS Conference on Neural Engineering (NER)*, 2013, 1270-1273. <https://doi.org/10.1109/NER.2013.6696172>
34. Lainscsek, C., **Hernandez, M. E.**, Poizner, H., & Sejnowski, T. (2013). Multivariate spectral analysis of electroencephalography data. *Proceedings of the 2013 6th International IEEE/EMBS Conference on Neural Engineering (NER)*, 2013, 1151-1154. <https://doi.org/10.1109/NER.2013.6696142>
35. Weyhenmeyer, J., **Hernandez, M. E.**, Lainscsek, C., Sejnowski, T., & Poizner, H. (2014). Muscle Artifacts in Single Trial EEG data Distinguish Patients with Parkinson's Disease from Healthy Individuals. *Proceedings of the 2014 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2014, 3292-3295. <https://doi.org/10.1109/EMBC.2014.6944326>
36. Widdowson, C., Ganhotra, J., Faizal, M., Wilko, M., Parikh, S., Adhami, Z., & **Hernandez, M. E.** (2016). Virtual reality applications in assessing the effect of anxiety on sensorimotor integration in human postural control. *Proceedings of the 2016 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2016, 33-36. <https://doi.org/10.1109/EMBC.2016.7590633>
37. Kaur, R., Lin, X., Layton, A., **Hernandez, M. E.**, & Sowers, R. (2018). Virtual reality, visual cliffs, and movement disorders. *Proceedings of the 2018 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2018, 81-84. <https://doi.org/10.1109/EMBC.2018.8512246>
38. Ziegelman, L., Hu, Y., & **Hernandez, M. E.** (2018). Neuromechanical simulation of hand pronation and supination task in Parkinson's disease. *Proceedings of the 2018 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2018, 2060-2063. <https://doi.org/10.1109/EMBC.2018.8512605>
39. Kaur, R., Sun, R., Ziegelman, L., Sowers, R., & **Hernandez, M. E.** (2019). Using virtual reality to examine the neural and physiological responses to height and perturbations in quiet standing. *Proceedings of the 2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2019, 5233-5236. <https://doi.org/10.1109/EMBC.2019.8857647>
40. Kaur, R., Menon, S., Zhang, X., Sowers, R., & **Hernandez, M. E.** (2019). Exploring characteristic features in gait patterns for predicting multiple sclerosis. *Proceedings of the 2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2019, 4217-4220. <https://doi.org/10.1109/EMBC.2019.8857604>
41. Kaur, R., Sun, R., Ziegelman, L., Sowers, R., & **Hernandez, M. E.** (2019). Using virtual reality to examine the neural and physiological anxiety-related responses to balance-

- demanding target-reaching leaning tasks. *Proceedings of the 2019 IEEE-RAS International Conference on Humanoid Robots (HUMANOIDS)*, 2019, 1-7. <https://doi.org/10.1109/Humanoids43949.2019.9035020>
42. Sun, R., Kaur, R., Ziegelman, L., Yang, S., Sowers, R., & **Hernandez, M. E.** (2019). Using virtual reality to examine the correlation between balance function and anxiety in stance. *Proceedings of the 2019 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, 2019, 1633-1640. <https://doi.org/10.1109/BIBM47256.2019.8983331>
43. Hu, Y., Bishnoi, A., Kaur, R., Sowers, R., & **Hernandez, M. E.** (2020). Exploration of Machine Learning to Identify Community Dwelling Older Adults with Balance Dysfunction Using Short Duration Accelerometer Data. *Proceedings of the 2020 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2020, 812-815. <https://doi.org/10.1109/EMBC44109.2020.9175871>
44. Kaur, R., Korolkov, M., **Hernandez, M. E.**, & Sowers, R. (2020). Automatic Identification of Brain Independent Components in Electroencephalography Data Collected while Standing in a Virtually Immersive Environment - A Deep Learning-Based Approach. *Proceedings of the 2020 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2020, 95-98. <https://doi.org/10.1109/EMBC44109.2020.9175741>
45. Weyhenmeyer, J., **Hernandez, M. E.**, Lainscsek, C., Poizner, H., & Sejnowski, T. (2020). Multimodal classification of Parkinson's disease using delay differential analysis. *Proceedings of the 2020 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, 2020, 2868-2875. <https://doi.org/10.1109/BIBM49941.2020.9313394>
46. Wang, S., Okubo, R., Liao, G., Ki, C., Sowers, R., & **Hernandez, M. E.** (In press). Designing a closed loop system to achieve real-time evaluation and manipulation of state anxiety while walking in virtual reality. *Proceedings of the 2021 10th International IEEE/EMBS Conference on Neural Engineering (NER)*.

BOOK CHAPTERS

1. **Hernandez, M. E.**, Sowers, R., Thompson, N., Krishnan, G., & Hsiao-Wecksler, E. T. (2020). Body-in-the-loop control of soft robotic exoskeletons during virtual manual labor tasks. In L. Bozgeyikli and R. Bozgeyikli (Eds.), *Virtual Reality: Recent Advancements, Applications and Challenges* (pp. 99-115). River Publishers.
2. Kaur, R., **Hernandez, M. E.**, & Sowers, R. (2020). Virtual reality and movement disorders. In L. Bozgeyikli and R. Bozgeyikli (Eds.), *Virtual Reality: Recent Advancements, Applications and Challenges* (pp. 55-98). River Publishers.

DATASETS

1. Harrigan, T., Syed, A., Hwang, B., Mathur, A., Mills, K., Pantelyat, A., Bang, J., Mishra, C., Vyas, P., Martin, S., Jamal, A., Ziegelman, L., **Hernandez, M. E.**, Gaite, A., Wong, D., &

- Brasic, J. (2020). *Quantitative continuous measurement of movements in the extremities* (Version 1) [Data set]. Mendeley Data. <https://doi.org/10.17632/xs8nycxg9v.1>
2. Suresh, A., **Hernandez, M. E.**, & Brasic, J. (2020). *Predicting scores of repetitive movement measurements using image classification* (Version 1) [Data set]. Mendeley Data. <https://doi.org/10.17632/vb3d9bt5p5.1>
 3. Ziegelman, L., **Hernandez, M. E.**, Kosuri, T., Martin, S., Shneyderman, M., Suresh, A., Gorny, A., Syed, A., Qureshi, A., Hope, A., Dutta, A., Jamal, A., Bhatnagar, A., Udoji, C., Cook, C., Youssef, H., Hakim, H., Brookshier, I., Kumari, K., Tang, K., Zhao, L., Shankar, M., Doheim, M., Mansour, M., Shehata, M., Elhady, M., Cho, N., Loza, N., Thakkar, R., Panaparambil, R., Bertucci, S., Elshourbagy, T., Hu, Y., Harrigan, T., & Brasic, J. (2020). *Signal processing of quantitative continuous measurement of movements in the extremities* (Version 7) [Data set]. Mendeley Data. <https://doi.org/10.17632/4dp4v7968z.7>

PUBLICATIONS IN REVISION OR IN REVIEW

1. Bishnoi, A., Chaparro, G., & **Hernandez, M. E.** Effect of Heart Rate Reserve on Prefrontal Cortical Activation while dual-task walking in older adults. *Brain and Cognition*; (In revision).
2. Chaparro, G., Singh, D., & **Hernandez, M. E.** Effects of aerobic fitness on prefrontal brain activation while dual-task walking in older adults. *Journal of Motor Behavior*; (In revision).
3. Aslan, D. H., **Hernandez, M. E.**, Frechette, M. L., Gephart, A. T., Soloveychik, I. M., & Sosnoff, J. J. The Neural Correlates of Motor Learning in People with Neurodegenerative Diseases: A Scoping Review. *Neuroscience and Biobehavioral Reviews*; (In review).
4. Hu, Y., Wang, J., Bishnoi, A., & **Hernandez, M. E.** Effect of Aging on Cyclic and Discrete Voluntary Shifts of Center of Pressure. *Human Movement Science*; (In review).

RESEARCH SUPPORT

INTERNAL FUNDING

Jump Applied Research through Community Health through Engineering and Simulation (ARCHES),

Principal Investigator, “Remote state anxiety detection and monitoring using multimodal wearable sensors”

2021-2022

Amount: \$75,000 Total Costs

Percent effort: no support

UIUC Strategic Research Initiative,

Co-Principal Investigator, “Center for Wearable Intelligent Technologies”

2020-2021

Hsiao-Weckslar, Elizabeth (PI)

Amount: \$75,000 Total Costs
Percent effort: no support

Collaborations in Health, Aging, Research, and Technology

Principal Investigator, “Feasibility of virtual reality and brain-computer interface technology for neurorehabilitation of fall-related anxiety in frail older adults”
Amount: \$4,971 Total Costs
Percent effort: no support

Jump Applied Research for Community Health through Engineering and Simulation

Principal Investigator, “Simulation of postural dysfunction in Parkinson’s disease”
Pending Amount: \$49,976 Total Costs
Percent effort: 5.5%

University of Illinois Campus Research Board

Principal Investigator, “The effect of fall-related anxiety on the cognitive control of gait in older women with osteoarthritis”
Amount: \$24,541 Total Costs
Percent effort: no support

University of Illinois Office of the Vice Chancellor for Research Equipment Funding

Principal Investigator, “Equitest balance assessment system for assessment of fall risk in aging and disabled populations”
Amount: \$128,000 Total Costs
Percent effort: no support

EXTERNAL FUNDING

National Institutes of Health, R01 NS109023-01A1

Co-Investigator, “Brain predictors of mobility and falls in older adults with multiple sclerosis”
2019-2024
Holtzer, Roe (PI)
Amount: \$704,983 (\$39,605) Total Costs
Percent effort: 2.5%

National Multiple Sclerosis Society, MB-1807-31633

Co-Investigator, “Cognitive Motor Interference Rehabilitation in Multiple Sclerosis”
2019-2024
Sosnoff, Jacob (PI)
Amount: \$425,000 Total Costs
Percent effort: no support

National Institutes of Health NRSA Individual Pre-doctoral Fellowship, F31 AG024689

Principal Investigator, “Training in trunk control biomechanics in older adults”

2005-2010

Alexander, NB, Ashton-Miller, JA (co-mentors)

Amount: \$207,665 Total Costs

Percent effort: 100%

PENDING RESEARCH SUPPORT

National Institutes of Health, National Institute on Aging,

Co-Investigator, “Minimizing Fall-Related Injury in Older Adults: a motor learning approach”

2021-2023

Amount: \$430,657 Total Costs

Percent effort: 4.4%

National Science Foundation Collaborative Research in Computation Neuroscience (CRCNS),

Principal Investigator, “Collaborative Research: Effect of anxiety on sensorimotor integration processes in community ambulation”

2021-2024

Amount: \$860,347 Total Costs

Percent effort: 10%

National Science Foundation Integrative Strategies for Understanding Neural and Cognitive Systems (NCS),

Principal Investigator, “Collaborative Research: NCS-FO: Effect of stress and aging on speed-accuracy tradeoffs in whole body movements”

2022-2024

Amount: \$449,763 Total Costs

Percent effort: 5.5%

National Science Foundation Smart Health and Biomedical Research in the Era of Artificial Intelligence and Advanced Data Science (SCH),

Principal Investigator, “SCH: Real-time anxiety detection and prediction using wearable intelligent technology”

2021-2024

Amount: \$1,199,977 Total Costs

Percent effort: 5.5%

Center on Health, Aging, and Disability Pilot Grant Program,

Principal Investigator, “Artificial intelligence energy-regulation modeling to predict and classify fatigue levels and types in people with multiple sclerosis: A feasibility study”

2021-2022

Amount: \$30,000 Total Costs

Percent effort: no support

Future Interdisciplinary Research Explorations Grant Program,

Co-Principal Investigator, “Turning fruit waste into value-added products: turboelectric devices for energy harvesting and biomechanics monitoring”

2021-2023

Wang, Yi-Cheng (PI)

Amount: \$60,000 Total Costs

Percent effort: no support

HONORS & AWARDS

List of Teachers Ranked as Excellent, University of Illinois (2019)

Michael V. Colla Prize for Mathematics Related to Medicine for co-mentored Illinois Geometry Lab research group (2019)

Illinois International Programs (IIP) International Conference Travel Grant (2018)

University of Michigan Rackham Conference Travel Grant (2009-2011)

National Institute of Health Individual Pre-doctoral Research Fellowship (2005-2010)

Engineering Graduate Symposium Oral Presentation 1st Place Winner (2008)

Epeians – Engineering Leadership Honor Society (2008)

Distinguished Leadership Award (2007)

Student Legacy Award Honorable Mention (2007)

Ginsberg Center Award for Community Service & Social Action’s Outstanding Community Impact Award (2006)

NSF Graduate Research Fellowship Program Honorable Mention (2004)

College of Engineering MLK Spirit Award Recipient (2004)

GEM M.S. Engineering Fellowship (2004)

Biomedical Engineering Departmental Fellowship (2003)

Pi Tau Sigma - Mechanical Engineering Honor Society (2003)

Eaton Minority Engineering Scholar (2000-2002)

Ford Motor Company Scholarship Recipient (1999-2003)

Robert C. Byrd Scholarship Recipient (1999-2003)

TEACHING EXPERIENCE

University of Illinois at Urbana-Champaign, Champaign, IL
Instructor, CHLH/HDFS 404: Gerontology.

Spring 2021

University of Illinois at Urbana-Champaign, Champaign, IL
Instructor, KIN 457: Motor Learning & Control.

Fall 2019-20

University of Illinois at Urbana-Champaign, Champaign, IL *Spring 2019-21*
Course Co-Director, Carle Illinois College of Medicine: Musculoskeletal.

University of Illinois at Urbana-Champaign, Champaign, IL *2018-2019*
Guest lecturer, NEUR 542: Neuroscience I: Topics in Cognitive, Behavioral, and Clinical Neuroscience
“Neuromechanics of posture and locomotion”

University of Illinois at Urbana-Champaign, Champaign, IL *2018*
Guest lecture, Applied Health Sciences, International Graduate Academic Training Program
“Biomechanics and motor control of human gait”

University of Illinois at Urbana-Champaign, Champaign, IL *2017*
Guest lecturer, NEUR 598: Neuroscience I: Topics in Cognitive, Behavioral, and Clinical Neuroscience
“Neuromechanics of posture and locomotion”

University of Illinois at Urbana-Champaign, Champaign, IL *2017-18*
Guest lecture, KIN 201: Physical Activity Research Methods
“Examining brain activation changes during locomotion in persons with multiple sclerosis”

University of Illinois at Urbana-Champaign, Champaign, IL *Spring 2017, Spring 2019*
Instructor, KIN 199: Undergraduate Open Seminar: Reimagining the future of brain injury treatment.

University of Illinois at Urbana-Champaign, Champaign, IL *Spring 2017, Fall 2019*
Instructor, KIN 199: Undergraduate Open Seminar: Baby boomers: A challenge to public health.

University of Illinois at Urbana-Champaign, Champaign, IL *2016*
Guest panelist, KIN 125: Orientation to Kinesiology Class
“Faculty Panel on Kinesiology Research”

University of Illinois at Urbana-Champaign, Champaign, IL *Spring 2016*
Instructor, KIN 494: Special Topics: Occupational & Rehabilitation Biomechanics.

University of Illinois at Urbana-Champaign, Champaign, IL *2015-17*
Instructor, KIN 494: Special Topics: Neuromechanics.

University of Illinois at Urbana-Champaign, Champaign, IL *Fall 2014-17,*

Instructor, KIN 355: Biomechanics of Human Movement. *Spring 2019*

University of Illinois at Urbana-Champaign, Champaign, IL *2014*
Guest lecture, MSE/BIOE 481: Whole Body Musculoskeletal Biomechanics Class
“Biomechanics of leaning and reaching movements”

Self-employed, San Diego, CA *2010-2012*
Tutor, undergraduate engineering coursework
Tutored undergraduate engineering student in statics, electrical circuits, electronics, applied mathematics for engineers and scientists, and physics.

University of Michigan, Ann Arbor, MI *2007*
Debrief Facilitator, Global Intercultural Experience for Undergraduates Program
Facilitated small group discussion on cultural misunderstandings and identity

University of Michigan, Ann Arbor, MI *2004-2006*
Team facilitator, ENGR 490: Engineering for Community Class
Defined objectives and benchmarks for pilot course in collaboration with faculty, staff, and students. Facilitated small project teams with problem identification, brainstorming, and project implementation. Developed lesson plans and prepared materials for single-class sessions.

University of Michigan, Ann Arbor, MI *2005*
Guest lecture, EHS 570: Water Quality Management Practices Class
“Household Water Purification in Rural Dominican Republic”

PROFESSIONAL DEVELOPMENT

Faculty Summer Institute (FSI), Champaign, IL *2018*
Participant, Annual Meeting
Learned and participated in hands-on workshops about teaching and learning with technology, so as to be better prepared for integration of team-based and problem-based learning principles in both undergraduate and graduate education.

Teaching Computation in the Sciences Using MATLAB, Carleton, MN *2016-2020*
Participant, Inaugural, 3rd, and 5th annual meeting
Developed activities for teaching computation in the sciences, developed resources for instructors to teach computation to students without any prior background on programming, and learned best practices for establishing trans-disciplinary education and flipped classroom techniques.

University of Illinois at Urbana-Champaign, Champaign, IL *2014-2017*
Participant, Center for Innovation in Teaching & Learning, Junior Faculty Seminar Series

Learned about the use of informal early feedback, writing effective i>clicker questions, active learning, teaching philosophy statement preparation, backward design, universal design, and improving testing and grading strategies.

University of California, San Diego, La Jolla, CA *2014*
Participant, Center for Teaching Development Teaching and Learning Weekly Workshops
Learned about learning outcomes, alternatives to lecture, peer instruction, and assessments that support learning.

Institute on Teaching & Mentoring, Tampa, FL *2010*
Participant, 17th Annual Compact for Faculty Diversity
Sharpened strategies to enhance the postdoctoral experience and navigating the first few years of a tenure-track academic position, so as to be better prepared for teaching, mentoring, and research as a member of the professoriate.

Stanford University, Palo Alto, CA *2009-2010*
Participant, OpenSim Developers Jamboree
Attended workshops designed to enhance my skills with OpenSim, focused on the OpenSim application programming interface (API) and integration of OpenSim models within MATLAB, conceptual overview of OpenSim, and generation of biomechanical models.

Stanford University, Palo Alto, CA *2008*
Participant, SimTK 1.5 Workshop
Attended workshop that provided the framework for mathematical modeling using the open-source toolkit, SimTK.

University of Michigan, Ann Arbor, MI *2007*
Participant, Preparing Future Faculty Conference
Learned about the structure of higher education institutions and how to effectively start, maintain, and mentor in a research laboratory.

University of Michigan, Ann Arbor, MI *2007*
Student, ENGIN 580: Teaching Engineering
Participated in academic course to better prepare for an academic career and to sharpen knowledge on learning theories and teaching issues. Prepared syllabus, brief lecture, design project, and exam for an undergraduate biomechanics course.

University of Michigan, Ann Arbor, MI *2004*
Participant, Training for Multicultural Classroom Facilitation
Participated in training course emphasizing teaching strategies to establish an open and inviting classroom, by exploring issues in multicultural teaching, engaging students in critical thinking, and strategies that anticipate and respond to difficult discussions.

University of Michigan, Ann Arbor, MI *2004*
Participant, CRLT Seminar on College Teaching
Participated in selected Center for Research on Learning and Teaching (CRLT) seminars to develop teaching skills on fostering and evaluating learning using concept maps and lecturing for learning.

RESEARCH EXPERIENCE

POST-DOCTORAL:

University of Illinois at Urbana-Champaign, Urbana, IL *2014-Present*
Director, Mobility and Fall Prevention Research Laboratory, Department of Kinesiology and Community Health, College of Applied Health Sciences

University of California, San Diego, San Diego, CA *2012-2014*
Postdoctoral Scholar, Institute for Neural Computation, Poizner Lab
Assessed the effect of Parkinson's disease and dopaminergic therapy on motor adaptation to grasping tasks. Utilized delay differential equation models for classifying Parkinson's disease patients vs. healthy age-matched control subjects using brief resting state electroencephalographic data. Examined the role of deep brain stimulation of the subthalamic nucleus (STN DBS) in reaching to kinesthetically provided targets in patients with Parkinson's disease.

PRE-DOCTORAL:

University of Michigan, Ann Arbor, Ann Arbor, MI *2003-2012*
Research Assistant, Mobility Research Center, Department of Biomedical Engineering
Designed novel biomechanical study of the effects of age on whole body movements utilizing force plate, motion-capture, isokinetic dynamometer, and EMG data. Developed custom MATLAB code for the simulation and analysis of rigid body dynamics.

University of California, Berkeley, Berkeley, CA *2002*
Research Assistant (SUPERB fellow), Department of Bioengineering
Investigated flow characteristics of water-sucrose solution in rectangular microchannels. Identified channel entry dynamics through digital capture techniques.

Cornell University, Ithaca, NY *2002-2003*
Independent Design Project, Department of Mechanical and Aerospace Engineering
Developed final design of fixture for use in quantitative comparisons of distal radius surgical plates. Fabricated custom-made components used in test fixture and coordinated purchase of necessary hardware.

Cornell University, Ithaca, NY *2000-2001*

Research Assistant, Department of Material Science and Engineering
Investigated properties of avian keratin in rachis and barb samples through x-ray diffraction.
Analyzed crystal diffraction in MATLAB and developed test sequence on turkey rachis.

Cornell University, Ithaca, NY 1999-2000

Laboratory Assistant, Ecology and Evolutionary Biology Department
Launched a database for the inventory of supplies in Venezuelan Research Outpost.
Conducted Chlorophyll Tests with fluorometers and calculated organic matter tabulations in excel.

University of Miami, Miami, FL 1998

Research Assistant, Department of Pediatric Cardiology, Jackson Memorial Hospital (JMH)
Initiated a study on the conditions of post-operative cardiac transplant pediatric patients in JMH. Researched the effect of immunosuppressants such as cyclosporin and tacrolimus on the heart.

MENTORING EXPERIENCE AS PRIMARY ADVISOR

University of Illinois at Chicago, Urbana, IL 2019-Present

Nursing Students, College of Nursing-Urbana, Research Supervisor
Rachel Lee: *Gait interventions targeting gait variability in older adults* (2019-Present).

University of Illinois at Urbana-Champaign, Urbana, IL 2020-Present

Medical Students, Carle Illinois College of Medicine, Research Elective Mentor
Zachary Meade: *The effect of vibrotactile stimulation on stochastic postural sway characteristics in transtibial amputees while standing* (2020-Present).

University of Illinois at Urbana-Champaign, Urbana, IL 2014-Present

Graduate Students, Kinesiology and Community Health Doctoral Program
Gioella Chaparro: *Effects of aerobic fitness on dual task walking in older adults* (2014-2018).
Yang Hu: *The effects of Tai chi on neuromuscular function in older adults* (2017-Present).
Alka Bishnoi: *Examining the effects of a novel instrumented trail walking task on brain activation and dual task performance in adults with impaired Heart Rate Reserve.* (2018-Present).

Andrew Hua: *A novel inertial measurement unit-based device for capturing upper extremity biomechanics* (2019).

Joerg Heintz: *Predicting clinical conditions using postural control data* (2021-Present).

University of Illinois at Urbana-Champaign, Urbana, IL 2021-Present

Graduate Students, Kinesiology and Community Health Masters of Science Program
Lingjun Chen: *Age-related differences of head control in response to unexpected external perturbation* (2021-Present).

University of Illinois at Urbana-Champaign, Urbana, IL 2017-Present
Graduate Students, Neuroscience Doctoral Program

Liran Ziegelman: *Computational modeling of dyskinesia in upper extremity movements of persons with Parkinson's disease* (2017-Present).

Rose Meacham: *Feasibility of BCI and VR in treating fall-related anxiety in frail older adults* (2018-2019)

University of Illinois at Urbana-Champaign, Urbana, IL 2019-Present
Graduate Students, International Graduate Mentoring Program

Shuo Yang: *Using virtual reality to examine the correlation between postural control ability and anxiety in stance* (2019).

Jing Zhang: *The relationship between proprioceptive function and neural plasticity after ACL rupture* (2019).

Qiqi Shen: *How anxiety influences heart rate variability in older adults with osteoarthritis* (2019).

Junqing Wang: *Aging effect on movement sway in cyclic and discrete voluntary shifts of center of pressure* (2019).

Lian Wang: *Muscle activation and motor control in women with knee osteoarthritis* (2019).

University of Illinois at Urbana-Champaign, Urbana, IL 2015-Present
Research Volunteer, Mobility and Fall Prevention Research Laboratory

Saurin Parikh: *Virtual reality applications in assessing the effect of anxiety on sensorimotor integration in human postural control* (2015-2016).

Clarence Lee: *The effect of central mechanisms mediating fall risks* (2019-2020)

University of Illinois at Urbana-Champaign, Urbana, IL 2014-Present
Undergraduate Students, Agricultural and Biological Engineering Bachelor of Science Program

Kerim Lakota: *The effect of anxiety on neural and cognitive processes* (2020).

University of Illinois at Urbana-Champaign, Urbana, IL 2014-Present
Undergraduate Students, Bioengineering Bachelor of Science Program

Rachel Walker: *The effect of body weight support on the postural control of older adults during self-paced gait* (2014-2016).

Grace Hubberty: *The effect of osteoarthritis on spatiotemporal gait dynamics* (2020-Present).

Tejaswini Govindaraman: *The effect of anxiety on neural and cognitive processes* (2020).

University of Illinois at Urbana-Champaign, Urbana, IL 2017-Present
Undergraduate Students, Biology Bachelor of Science Program

Marie-Laure Mbi: *Motor cortical potentials during whole body movements* (2017-2019).

University of Illinois at Urbana-Champaign, Urbana, IL 2015-Present
Undergraduate Students, Chemical Engineering Bachelor of Science Program

Zain Adhami: *Postural control stability within quiet standing* (2015-2016).

University of Illinois at Urbana-Champaign, Urbana, IL 2015-Present

Undergraduate Students, Chemistry Bachelor of Science Program

Marissa Wilko: *Stochastic postural control dynamics of older adults* (2015-2017).

University of Illinois at Urbana-Champaign, Urbana, IL 2015-Present

Undergraduate Students, Computer Science Bachelor of Science Program

Mohammed Faizal: *Multivariate data acquisition and synchronization in Python* (2015-2016).

James Yang: *Walking after stroke project* (2018).

Thomas Macheras: *Walking after stroke project* (2018).

Arjun Arun: *Walking after stroke project* (2018).

Megha Mattikali: *Automatic artifactual independent component selection* (2019-2020).

Andong Jing: *Automatic artifactual independent component selection* (2019-2020).

Xiao Ye: *The effect of anxiety on neural and cognitive processes* (2020).

Tina Kong: *Instrumented trail walking tasks* (2021-Present).

University of Illinois at Urbana-Champaign, Urbana, IL 2015-Present

Undergraduate Students, Computer Engineering Bachelor of Science Program

Shruthii Sathyanarayanan: *Virtual reality environment development in Python and Unity* (2018).

Xinyi Guo: *Virtual reality environment development in Python and Unity* (2018).

Jiamin Zhu: *The effect of anxiety on neural activity in older adults* (2019-2020).

Lingxiao Mou: *The effect of anxiety on neural and cognitive processes* (2020).

University of Illinois at Urbana-Champaign, Urbana, IL 2019-Present

Undergraduate Students, Electrical and Computer Engineering Bachelor of Science Program

Maxim Korolkov: *Automatic artifactual independent component selection* (2019-2020).

Daniel Ahn: *The effect of anxiety on neural and cognitive processes* (2020).

Xinyi Lai: *The effect of anxiety on neural and cognitive processes* (2020).

Ryu Okubo: *The effect of anxiety on neural and cognitive processes* (2020-Present).

University of Illinois at Urbana-Champaign, Urbana, IL 2015-Present

Undergraduate Students, Integrative Biology Bachelor of Science Program

Larisa Piton: *The effect of attention in the gait of older adults with Parkinson's disease* (2015-2016).

Nikola Koziol, *Gait dynamics in older adults with osteoarthritis* (2017-2018).

University of Illinois at Urbana-Champaign, Urbana, IL 2015-Present

Undergraduate Students, Integrative Health Bachelor of Science Program

Lia Godinez: *The effect of body weight support on gait characteristics of older adults* (2015-2017).

University of Illinois at Urbana-Champaign, Urbana, IL 2016-Present
Undergraduate Students, Interdisciplinary Health Science Bachelor of Science Program
Min Chen: *The effect of central mechanisms mediating fall risks in older adults* (2016-2017).
Cecilia Kattan: *Dynamic postural control changes with Tai chi practice* (2017-2019).

University of Illinois at Urbana-Champaign, Urbana, IL 2016-Present
Undergraduate Students, General Studies Bachelor of Science Program
Claire Pavlis: *Gait dynamics in older with neurological disorders* (2016-2017).

University of Illinois at Urbana-Champaign, Urbana, IL 2021-Present
Undergraduate Students, Finance Bachelor of Science Program
Krishna Subbiah: *Gait changes in older women with osteoarthritis* (2021-Present).

University of Illinois at Urbana-Champaign, Urbana, IL 2014-Present
Undergraduate Students, Kinesiology and Community Health Bachelor of Science Program
William Stein: *The effects of dual-task walking under partial weight bearing conditions in older adults* (2014-2015).

Erin O'Donnell: *Biomechanical mechanisms underlying postural dysfunction in older adults* (2015-2018).

Marisa Ascencio: *The effect of attention in the gait of older adults* (2015-2016).

Dena Kontos: *The effect of anxiety on postural control in older adults* (2016-2018).

Palack Mahajan: *Central mechanisms mediating fall risk in older adults* (2016).

Ryan Prais: *Dynamic postural control changes with Tai chi practice* (2017).

Geri Lyu: *Gait dynamics in older adults with osteoarthritis* (2017-2020).

Julie Chen: *Gait dynamics in older adults with osteoarthritis* (2018-2019).

Matthew Georges: *Gait dynamics in older adults with osteoarthritis* (2018-2019).

Luqi Zhao: *Gait dynamics in older adults with osteoarthritis* (2019-Present).

Alyssa Masangkay: *Gait dynamics in older adults with osteoarthritis* (2019-2020).

Conor Cook: *Gait dynamics in older adults with osteoarthritis* (2019-Present).

Hyun Oh: *Gait dynamics in older adults with osteoarthritis* (2019-2020).

Isabella Brookshier: *Gait dynamics in older adults with clinical conditions* (2020-Present).

Reema Thakkar: *Gait dynamics in older adults with clinical conditions* (2020-Present).

Meghna Shankar: *Gait dynamics in older adults with clinical conditions* (2020-Present).

Krishna Patel: *Gait dynamics in older adults with clinical conditions* (2020-Present).

University of Illinois at Urbana-Champaign, Urbana, IL 2016-Present
Undergraduate Students, Materials Science and Engineering Bachelor of Science Program
Nikhil Krishnan: *Central mechanisms mediating fall risk in older adults* (2016-2017).
Yoshihiro Koyake: *Effect on osteoarthritis on knee musculoskeletal dynamics during gait* (2018-2019).

Kathryn Lee: *Effect on osteoarthritis on knee musculoskeletal dynamics during gait* (2018-2019).

Joe Boyce: *The effect of central mechanisms mediating fall risks* (2019-2020).

University of Illinois at Urbana-Champaign, Urbana, IL 2019-Present

Undergraduate Students, Mechanical Science & Engineering Bachelor of Science Program

Joseph Sim: *The effect of anxiety on neural activity in older adults* (2019-2020).

Eddie Wang: *The effect of central mechanisms mediating fall risks* (2019-2020).

Jessica Yoon: *Neuromechanical model of toe tapping for Parkinson's disease* (2019-2020).

Gekai Liao: *The effect of anxiety on neural and cognitive processes* (2020-Present).

Conrad Ku: *Neuromechanical modeling of simple motor tasks in persons with Parkinson's disease* (2020).

University of Illinois at Urbana-Champaign, Urbana, IL 2015-Present

Undergraduate Students, Molecular and Cellular Biology Bachelor of Science Program

Veronica Passarelli: *The effect of attention in the gait of older adults with Multiple Sclerosis* (2015-2016).

Despina Hadjiagapiou: *Neural mechanisms underlying postural dysfunction in older adults with neurological disorders* (2015-2016).

Delaney Durst: *Central mechanisms mediating fall risk in older adults* (2016-2018).

Abel Varghese: *Central mechanisms mediating fall risk in older adults* (2016-2020).

Mae Leef: *Gait dynamics in older with neurological disorders* (2016-2017).

Kelley Tran: *Gait dynamics in older with neurological disorders* (2017-2018).

Devashish Singh: *Gait dynamics in older with neurological disorders* (2017-2018).

Madeline McDevitt: *Motor cortical potentials during whole body movements* (2017).

Rongyi Sun: *Central mechanisms mediating fall risk in older adults* (2017-2019).

Jessica Wcislo: *Behavioral biomarkers of dyskinesia in Parkinson's disease* (2017-2018).

Josephine Tsang: *Gait dynamics in older adults with osteoarthritis* (2017-2019).

Jerold Macaya: *Motor-cognitive interference in persons with multiple sclerosis* (2017-2018).

Shruti Shah: *The effect of central mechanisms mediating fall risks in older adults with Parkinson's disease* (2018-2019).

Mia DeTella: *Central mechanisms mediating fall risk in older adults* (2018).

Samantha Silverstein: *Central mechanisms mediating fall risk in older adults* (2018-2019).

Elisabeth Schwarzkopf: *Gait dynamics in older adults with osteoarthritis* (2018-2019).

Carter Livergood: *Gait dynamics in older adults with osteoarthritis* (2019-2020).

Nicole Cho: *Gait dynamics in older adults with osteoarthritis* (2019-2020).

Ammara Qureshi: *Gait dynamics in older adults with osteoarthritis* (2019-Present).

University of Illinois at Urbana-Champaign, Urbana, IL 2016-Present

Undergraduate Students, Psychology Bachelor of Science Program

Alison Chan: *The effect of attention in the gait of older adults with Parkinson's disease* (2016).

Joseph Nangachiveetil: *The effect of central mechanisms mediating fall risks in older adults* (2016-2018).

Nancy Ramirez-Blancas: *Motor cortical potentials during whole body movements* (2017).

Yifan Gao: *Modeling postural dysfunction in persons with Parkinson's disease* (2018).

University of Illinois at Urbana-Champaign, Urbana, IL 2015-Present

Undergraduate Students, Speech and Hearing Science Bachelor of Science Program

Heather Lalla: *The effect of attention in the gait of older adults with Parkinson's disease* (2015).

University of Illinois at Urbana-Champaign, Urbana, IL 2019-Present

Undergraduate Students, Systems Engineering and Design Bachelor of Science Program

Simon Addo: *The effect of anxiety on neural activity in older adults* (2019-2020).

Austin Lu: *The effect of anxiety on neural activity in older adults* (2019-2020).

Siwen Wang: *The effect of anxiety on neural activity in older adults* (2019-Present).

University of Illinois at Urbana-Champaign, Urbana, IL 2014-Present

James Scholar Project,

Mary Heaton: *Fall risk in older amputee population* (2014).

Dana Jorgenson: *The role of exercise on gait characteristics of older adults with osteoarthritis* (2015).

Alli Mack: *Balance and gait function in older adults with multiple sclerosis* (2015).

Margret Gruben: *The biomechanical adjustments of prosthetics* (2016).

Kelsey Thompson: *A biomechanical review of anterior cruciate ligament injuries in female soccer players* (2016).

Dena Kontos: *Effects of Tai Chi on fall risk and the connections with lower extremity muscle activation changes* (2017)

Gabrielle Schweitzer: *ACL injuries in female basketball players: Why?* (2017)

Reagan Tapley: *Musculoskeletal effects of high-heeled shoes* (2017)

University of Illinois at Urbana-Champaign, Urbana, IL 2019-Present

Researchers Initiative,

Sanjana Sastry: *Oscillating ankle model for Parkinson's disease* (2019).

Carolyn Simon: *Coding and calibration with kinesiology* (2019).

Apurva Sanagavarapu: *Coding and calibration with kinesiology* (2019-2020).

University of Illinois at Urbana-Champaign, Urbana, IL 2015-Present

Summer Research Opportunity Program, Recipient of Ave Alvarado Award, Best Poster Presentation-Honorable Mention

Kharine Jean: *The effect of walking on cognitive performance in Multiple Sclerosis: Insight into compensatory cortical activation* (2015).

University of Illinois at Urbana-Champaign, Urbana, IL 2019-Present

SPARK: Students Pursuing Applications, Research, and Knowledge,

Lauren Penick: *The effect of central mechanisms mediating fall risks in older adults* (2019-2020).

Jennifer Zhao: *The effect of anxiety on neural and cognitive processes* (2020-2021).

University of California, San Diego, CA 2013-2014

Poizner Lab

Cory Stevenson: *Behavioral and neural mechanisms underlying postural dysfunction in PD* (2013-2014).

Raj Panchal: *Behavioral and neural mechanisms underlying balance control* (2013).

University of Michigan, Ann Arbor, MI 2005-2008

Undergraduate Research Opportunity Program

Lindsay Dubbs: *Studies of mobility assessment and enhancement in older adults* (2005-2006).

Michael Black: *Lifting characteristics of older adults with self-reported difficulty* (2006-2007).

Pooja Desai: *Learning effects in distal postural control tasks* (2006-2008).

Victoria Washington: *Biomechanics of older adults with stooping, crouching, or kneeling difficulty* (2007-2008).

University of Michigan, Ann Arbor, MI 2006-2007

Mobility Research Center Research Assistant

Radhika Patel: *The role of postural and configuration control on downward reach and pick-up movements in older adults* (2006).

Adam Biddle: *Development of biomechanical data analysis methods in MATLAB* (2007).

OTHER MENTORING EXPERIENCE

University of Illinois at Urbana-Champaign, Urbana, IL 2017-Present

Postdoc, Beckman Institute Postdoctoral Fellows Program

Rachel Klaren (Bollaert): *Physical activity and sedentary behavior and brain health in older adults with multiple sclerosis* (2017-2018).

PARTICIPATION IN EXAMINING COMMITTEE

University of Illinois at Urbana-Champaign, Urbana, IL 2018-Present

Graduate Students, Educational Psychology Doctoral Program

Ted Worm, *Does working together increase flow with age?*, prelim committee (2018),
doctoral committee (2020).

University of Illinois at Urbana-Champaign, Urbana, IL 2019-Present

Graduate Students, Industrial and Enterprise Systems Engineering Doctoral Program

Shrey Pareek, *iART: An intelligent assistive robotic therapy system for home-based stroke rehabilitation*, prelim committee (2019), doctoral committee (2020).

University of Illinois at Urbana-Champaign, Urbana, IL 2016-Present

Graduate Students, Kinesiology and Community Health Doctoral Program

Douglas A. Wajda, Ph.D., *Cognitive-Motor Interaction: Influence of the individual, the task and the environment*, prelim committee (2016), doctoral committee (2016).

Yaejin Moon, Ph.D. *Can older adults learn to fall safely?* prelim committee (2017), doctoral committee (2018).

Tyler Wood, *Traumatic brain injuries and older adults: the implications of neck strength, muscle activation, and range of motion*, prelim committee (2018), doctoral committee (2019).

Tim Yang, *Effects of anticipatory planning constraints on power wheelchair driving in people with cerebral palsy*, prelim committee (2019).

Libak Abou, *Fall assessment among non-ambulatory individuals living with spinal cord injury*, prelim committee (2020).

University of Illinois at Urbana-Champaign, Urbana, IL 2016-Present

Graduate Students, Linguistics Doctoral Program

John Jang, Ph.D., *Using Force Plates as a Way to Objectively Measure Listening Comprehension Difficulty*, prelim committee (2016), doctoral committee (2017).

University of Illinois at Urbana-Champaign, Urbana, IL 2018-Present

Graduate Students, Neuroscience Doctoral Program

Paul Camacho, *Effects of a voluntary saccade training program in persons with Parkinson's disease*, diagnostic committee (2018), qualifying exam committee (2021).

Maxine He, *Changes in stretch reflex response after participation in a targeted ballet class for individuals with mixed spastic and dyskinetic cerebral palsy*, diagnostic committee (2021),

INDUSTRY EXPERIENCE

Medtronic Corporation, Neurological Division, Minneapolis, MN 2003-2004

Summer Associate, Neurological Lead Development Group

Developed a column buckle test method as a means to characterize lead distal tip behavior.

Validated statistical model used for tolerance analysis of neurological stimulator connections. Standardized test protocols for use in characterization and design verification testing of leads and extensions. Designed and tested interior surface modifications to an existing anchor for concept evaluation.

Eaton Corporation (Tech Center), Pittsburgh, PA 2001

EMESP intern, Molded Case Circuit Breaker (MCCB) Group

Developed comprehensive tolerance analysis tool for mechanism in EF breaker. Executed development testing on new product line and coordinated construction of samples.

Eaton Corporation (SEO), Beverly, MA

2000

EMESP intern, Mechanical Engineering group

Designed Excel models to determine pressure gradient across components of a SDS Gas Box Module (GBM). Drafted DCO release drawings in AutoCAD 2000 and utilized Pro-E to visualize fluid flow of a GBM.

ORGANIZATIONAL LEADERSHIP EXPERIENCE

Better Living Using Engineering Laboratory, University of Michigan, Ann Arbor, MI,
Vice-President (2003-2005), Co-President (2005-2007)

Engineers for a Sustainable World, Ithaca, NY, Central-East Regional Director of Chapter Relations (2004-2005)

Engineers without Frontiers, Cornell University Chapter, Ithaca, NY, Co-President, member of founding executive board (2002-2003)

Society of Hispanic Professional Engineers, Cornell University Chapter, Ithaca, NY,
Director of Communications (2000-2001), Director of Marketing and Career Development (2001-2002)

Engineering Student Council, Cornell University Chapter, Ithaca, NY, Co-Chair of Representatives (2001-2002)

ENGAGEMENT

The Gerontological Society of America, Lapsed member outreach volunteer (2021)

Latinx in Biomechanix, International Recruitment Co-Chair (2021)

2021 NIH Motor Function, Speech and Rehabilitation Study Section, Ad Hoc Reviewer (2021)

2021 Wellcome Trust, Peer Reviewer (2021)

Illini Fall Prevention Clinic, Urbana-Champaign, IL, Director (2021)

Department of Kinesiology and Community Health, Motor Control/Biomechanics, Urbana-Champaign, IL, Area Coordinator (2020-Present)

2021 NSF Reviewer, Reviewer (2021)

2020 Medical Research Council, Peer Reviewer (2020)

Department of Kinesiology and Community Health, Student Grievance/Alleged Capricious Grading Committee, Urbana-Champaign, IL, Member (2020)

Carle Illinois College of Medicine, Search Committee for Engineering Academic Coordinator, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Member (2020)

2020 Virtual Undergraduate Research Symposium, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Judge (2020)

Carle Illinois College of Medicine, Engineering Task Force, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Member (2020)

2020 Wellcome Trust, Peer Reviewer (2020)

2020 NSF Review Panel, Panelist (2020)

University of Illinois-Mexico partnership for greater diversity and the advancement of Mexican and Mexican Americans in Illinois, Project Team Member (2019-Present)

College of Applied Health Sciences, Elections and Credentials Committee, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Member (2019-Present)

2019 Undergraduate Research Symposium, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Judge (2019)

Campus Research Board, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Peer Reviewer (2019)

2019 NSF Reviewer, Reviewer (2019)

Illinois Multiple Sclerosis Research Collaborative, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Member (2019-Present)

2018 Department of Veterans Affairs Office of Research and Development's Rehabilitation Research and Development Service, Small Projects in Rehabilitation Research Award Program, Reviewer (2018)

Carle Illinois College of Medicine, Student Progress and Promotions Committee, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Member (2018-Present)

Department of Kinesiology and Community Health, Search Committee for Teaching Assistant Professor in Children's Physical Activity and Pedagogy, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Member (2018)

Department of Kinesiology and Community Health, Search Committee for Adjunct Lecturer in Public Health Practice, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Member (2018)

James Scholar Seminar Class Lab Tours, Volunteer (2018-Present)

2018 Illini Summer Academy, Volunteer (2018)

Campus Research Board, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Peer Reviewer (2018)

Department of Kinesiology and Community Health, College of Applied Health Sciences, KCH Chittenden Family Foundation Fund Ad Hoc Committee, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Member (2018)

Department of Kinesiology and Community Health, College of Applied Health Sciences, KCH Honors and Awards Committee, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Member (2018)

Department of Kinesiology and Community Health, College of Applied Health Sciences, Minors Committee, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Member (2018)

2018 NSF Reviewer, Reviewer (2018)

The Next 150 Strategic Planning meeting on making a significant and visible societal impact, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Participant (2017)

Global Issues Forum: Health in Smart Urban Environments, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Participant (2017)

Department of Kinesiology and Community Health, College of Applied Health Sciences, Graduate College Travel Grant Application Committee, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Member (2017)

2017 NSF Reviewer, Reviewer (2017)

2017 Experience Illinois Program, Engagement Activity Coordinator (2017)

Neuroscience Program Executive Committee, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Outreach/Brain Awareness Chair (2016)

Department of Kinesiology and Community Health, College of Applied Health Sciences, Search Committee for Health Technology and Aging position, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Member (2016)

Carle Illinois College of Medicine, Musculoskeletal Course, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Interim Course Co-Director (2016)

Extreme Entrepreneurial lock-in (Topic: Aging in Modern Society), Innovation Living-Learning Community and Sustainability Living-Learning Community, University of Illinois at Urbana-Champaign, Urbana, IL, Judge (2015)

Brain awareness day, University of Illinois at Urbana-Champaign, Champaign, IL, Volunteer (2015, 2018), Executive Committee Faculty Member (2015-2017)

College of Applied Health Sciences Ad hoc committee on Rehabilitation engineering and safe, independent living in the latter part of the lifespan, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, Member (2015)

Temporal Dynamics of Learning Center (TDLC) Fellows Committee, University of California, San Diego, CA, Sensory Motor Network Representative (2012-2014)

Cornell Alumni Admissions Ambassador Network, Cornell University, Ithaca, NY, Member (2009-Present)

Departmental Visit Committee, University of Michigan, Ann Arbor, MI, Co-chair (2008)

BME Graduate Orientation, University of Michigan, Ann Arbor, MI, Volunteer (2005,2007)

BME Graduate Student Academic Committee, University of Michigan, Ann Arbor, MI, Member (2006-2007)

RECRUITMENT OF UNDERREPRESENTED MINORITIES, UNIVERSITY OF MICHIGAN

HENAAC Career Exposition and Awards Show, Career Fair and Graduate School Fair, Anaheim, CA, October 5-7, 2006.

Cornell University, Information Session and Graduate School Fair, Ithaca, NY, September 27-28, 2005.

Society of Hispanic Professional Engineers National Conference, Graduate Student Panel and Career Fair, Dallas, TX, January 5-9, 2005.

PROFESSIONAL ENGAGEMENT

Reviewer for 2021 Annual Conference of the American Society of Biomechanics.

Reviewer for Applied Sciences

Reviewer for Assistive Technology

Reviewer for Medical & Biological Engineering & Computing

Reviewer for Journal of NeuroEngineering and Rehabilitation

Reviewer for Journal of Biomedical and Health Informatics

Reviewer for 2021 Annual Conference of the Gerontological Society of America, Phoenix, AZ, USA.

Guest editor for International Journal of Environmental Research and Public Health, Special Issue on Mobility Impairments from a Multimodal Neuroscience of Aging Perspective

Reviewer for Assistive Technology

Reviewer for Medical Engineering & Physics

Reviewer for Biomedical Engineering Division and Design in Engineering Education Division for 2021 Annual Conference of the American Society for Engineering Education, Long Beach, CA.

Reviewer for Experimental Gerontology

Reviewer for Ergonomics

Co-moderator of Balance & Falls 2 session, 2020 Annual Meeting of the American Society of Biomechanics, August 6, 2020.

Reviewer for 2020 Annual Conference of the Gerontological Society of America, Philadelphia PA, USA.

Reviewer for Design in Engineering Education Division for 2020 Annual Conference of the American Society for Engineering Education, Montreal, Quebec, Canada.

Co-chair of nanosymposium on “Parkinson's Disease: From Preclinical to Human Studies”, Annual Meeting of the Society for Neuroscience, Chicago, IL, October 21, 2019.

Reviewer for Motor Control

Reviewer for Journal of Neuroscience Methods

Reviewer for Journal of Clinical and Experimental Neuropsychology

Reviewer for Computer in Biology and Medicine

Reviewer for 2018 University of Nebraska Internal Grant Program

Reviewer for Physical Therapy

Reviewer for Biomedical Engineering Division for 2018 Annual Conference of the American Society for Engineering Education, Salt Lake City, UT, USA.

Reviewer for Annals of Biomedical Engineering

Reviewer for Computer Methods and Programs in Biomedicine

Reviewer for 2017 Annual Conference of the American Society of Biomechanics, Boulder, CO, USA.

Reviewer for Brain and Cognition

Reviewer for Biomedical Engineering Division for 2017 Annual Conference of the American Society for Engineering Education, Columbus, OH, USA.

Reviewer for Journal of Neurological Sciences

Reviewer for Journal of Biomechanics

Reviewer for Psychology and Neuroscience

Reviewer for 2016 Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Orlando, FL, USA.

Reviewer for 2016 Annual Conference of the Gerontological Society of America, New Orleans, LA, USA.

Reviewer for for 2016 Annual Conference of the Gait & Clinical Movement Analysis Society, Memphis, TN, USA.

Reviewer for Biomedical Engineering Division for 2016 Annual Conference of the American Society for Engineering Education, New Orleans, LA, USA.

Reviewer for Journal of Motor Behavior

Reviewer for Journal of Rehabilitation Research & Development

Reviewer for PLOS ONE

Reviewer for Human Movement Science

Reviewer for Neurorehabilitation & Neural Repair

Reviewer for IEEE Transactions on Biomedical Engineering

Reviewer for Physiotherapy Theory and Practice

Reviewer for Journal of the American Aging Association

Reviewer for IEEE Transactions on Biomedical Circuits and Systems

Reviewer for 3rd Annual International Conference on Biomedical Engineering and Biotechnology, Beijing, China.

Reviewer for 2014 Annual Conference of the Gerontological Society of America, Washington, DC, USA.

Reviewer for Transactions on Neural Systems & Rehabilitation Engineering

Reviewer for Clinical Interventions in Aging

Reviewer for BMC Musculoskeletal Disorders

Reviewer for BMC Geriatrics

Reviewer for Design in Engineering Education Division for 2013 Annual Conference of the American Society for Engineering Education, Atlanta, GA, USA.

Reviewer for Journal of Gerontology: Medical Sciences

Reviewer for Design in Engineering Education Division for 2011 Annual Conference of the American Society for Engineering Education, Vancouver, BC, Canada.

Co-chair of Aging session, 33rd Annual Meeting of the American Society of Biomechanics, State College, PA, August 28, 2009.

PROFESSIONAL MEMBERSHIPS

American Association for the Advancement of Science • American Society of Biomechanics
American Society for Engineering Education • IEEE Engineering in Medicine and Biology
Society • International Parkinson and Movement Disorder Society • Gait and Clinical
Movement Analysis Society • Gerontological Society of America • Society for Neuroscience
Society for the Neural Control of Movement

ABSTRACTS (NOT INCLUDED IN PRESENTATIONS)

1. Goldberg, A., **Hernandez, M. E.**, & Alexander, N.B. (2004, June 4). *Relationships between trunk strength, trunk proprioceptive acuity, and clinical measures of balance in balance-impaired older adults* [Paper presentation abstract]. Annual Meeting of the American College of Sports Medicine, Indianapolis, IN, United States
2. Goldberg, A., **Hernandez, M. E.**, & Alexander, N.B. (2004, November 19-23). *Trunk repositioning errors are increased in balance-impaired functionally-independent older adults* [Paper presentation abstract]. 57th Annual Meeting of the Gerontological Society of America, Washington, DC, United States.
3. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2007, November 16-20). *Downward reach-pick-up strategies in older females with self-reported difficulty* [Paper presentation abstract]. 60th Annual Meeting of the Gerontological Society of America, San Francisco, CA, United States.
4. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2009, November 18-22). *Losses of balance during downward reach and pick-up movements in older adults* [Paper presentation abstract]. 62nd Annual Meeting of the Gerontological Society of America, Atlanta, GA, United States.
5. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2012, November 14-18). *Influence of Postural Control and Leg Strength on Downward Reaching Performance in Older Adults* [Poster presentation abstract]. 65th Annual Meeting of the Gerontological Society of America, San Diego, CA, United States.
6. Lainscsek, C., Weyhenmeyer, J., **Hernandez, M. E.**, Poizner, H., & Sejnowski, T. (2013, November 9-13). *Non-linear dynamical classification of short time series of the Rössler system in high noise regimes* [Poster presentation abstract]. Annual Meeting of the Society for Neuroscience, San Diego, CA, United States.
7. Lainscsek, C., **Hernandez, M. E.**, Weyhenmeyer, J., Sejnowski, T., & Poizner, H. (2013, November 9-13). *Non-linear dynamical analysis of EEG time series distinguishes patients with Parkinson's disease from healthy individuals* [Poster presentation abstract]. Annual Meeting of the Society for Neuroscience, San Diego, CA, United States.
8. Lukos, J. R., Hillyard, S., Kaestner, E., **Hernandez, M. E.**, Snider, J., Tunik, E., Halgren, E., & Poizner, H. (2013, November 9-13). *EEG abnormalities in patients with Parkinson's*

- disease during online grasp adaptation* [Poster presentation abstract]. Annual Meeting of the Society for Neuroscience, San Diego, CA, United States.
9. **Hernandez, M. E.**, Stevenson, C., Snider, J., & Poizner, H. (2013, November 9-13). *Human cortical theta during quiet stance encodes postural stability* [Poster presentation abstract]. Annual meeting of the Society for Neuroscience, San Diego, CA, United States.
 10. **Hernandez, M. E.**, Weyhenmeyer, J., Lainscsek, C., Sejnowski, T.J., & Poizner, H. (2014, November 15-19). *Delay differential analysis of EEG during reaching to grasp virtual objects* [Poster presentation abstract]. Annual Meeting of the Society for Neuroscience, Washington, DC, United States.
 11. Chaparro, G., Moon, Y., Wajda, D., Sosnoff, J., & **Hernandez, M. E.** (2015, October 17-21). *Influence of attention and stance on postural control stochastic dynamics* [Poster presentation abstract]. Annual Meeting of the Society for Neuroscience, Chicago, IL, United States.
 12. **Hernandez, M. E.**, Weyhenmeyer, J., Lainscsek, C., Sejnowski, T., & Poizner, H. (2015, October 17-21). *Delay differential analysis: a framework for multimodal non-linear classification of Parkinson's Disease* [Poster presentation abstract]. Annual Meeting of the Society for Neuroscience, Chicago, IL, United States.
 13. Chaparro, G., Moon, Y., Wajda, D., Sosnoff, J., **Hernandez, M. E.** (2015, November 18-22). *Influence of attention on postural control stochastic dynamics in young and older adults* [Poster presentation abstract]. 68th Annual Meeting of the Gerontological Society of America, Orlando, FL, United States.
 14. Chaparro, G., Piton, L., Walker, R., Holtzer, R., Izzetoglu, M., Motl, R., & **Hernandez, M. E.** (2016, October 30-November 4). *Effects of dual-tasking and body weight support on prefrontal cortical activation in individuals with multiple sclerosis* [Poster presentation abstract]. Annual Meeting of the American Congress of Rehabilitation Medicine, Chicago, IL, United States.
 15. **Hernandez, M. E.**, Chaparro, G., O'Donnell, E., Holtzer, R., Izzetoglu, M., & Motl, R. (2016, November 12-16). *Brain activation changes during balance and attention demanding tasks in older adults with multiple sclerosis* [Poster presentation abstract]. Annual Meeting of the Society for Neuroscience, San Diego, CA, United States.
 16. **Hernandez, M. E.** (2016, November 16-20). *Brain activation changes during locomotion in older adults with multiple sclerosis* [Paper presentation abstract]. 69th Annual Meeting of the Gerontological Society of America, New Orleans, LA, United States.
 17. **Hernandez, M. E.**, Chaparro, G., & Kersh, M. (2017, November 11-15). *The role of anxiety on the cognitive control of gait in older adults* [Poster presentation abstract]. Annual Meeting of the Society for Neuroscience, Washington, DC, United States.
 18. Ziegelman, L., Hu, Y., Sun, R., & **Hernandez, M. E.** (2018, November 3-7). *A personalized neuromechanical simulation of hand pronation and supination task in persons with Parkinson's disease: effects of tonic dopamine levels and disease progression* [Poster presentation abstract]. Annual Meeting of the Society for Neuroscience, San Diego, CA, United States.
 19. Bishnoi, A., Chaparro, G., & **Hernandez, M. E.** (2019, October 19-23). *Heart rate reserve relationship with prefrontal cortical activation in healthy older adults while dual tasking*

- [Poster presentation abstract]. Annual Meeting of the Society for Neuroscience, Chicago, IL, United States.
20. Ziegelman, L., Sun, R., Hu, Y., & **Hernandez, M. E.** (2019, October 19-23). *A neuromechanical model of continuous wrist motion* [Poster presentation abstract]. Annual Meeting of the Society for Neuroscience, Chicago, IL, United States.
 21. Kaur, R., Sun, R., Ziegelman, L., Sowers, R., & **Hernandez, M. E.** (2019, November 3-8). *Using virtual reality high fall-risk condition training to improve postural control accuracy and speed* [Poster presentation abstract]. Annual Meeting of the American Congress of Rehabilitation Medicine, Chicago, IL, United States.
 22. **Hernandez, M. E.** (2019, November 13-17). *Prefrontal cortical activity differences while dual-task walking in older adults with impaired mobility* [Paper presentation abstract]. 69th Annual Meeting of the Gerontological Society of America, Austin, TX, United States.
 23. Bishnoi, A., Hu, Y., **Hernandez, M. E.** (2020, October 21-24). *Effect of osteoarthritis on prefrontal cortical activation patterns during dual task walking in older women* [Poster presentation abstract]. Annual Meeting of the American Congress of Rehabilitation Medicine (ACRM).
 24. Bishnoi, A., Hu, Y., **Hernandez, M. E.** (2020, October 21-24). *Effect of anxiety inducing virtual reality environments on prefrontal cortical activation among older women with and without osteoarthritis* [Poster presentation abstract]. Annual Meeting of the American Congress of Rehabilitation Medicine (ACRM).
 25. Bishnoi, A., Hu, Y., **Hernandez, M. E.** (2020, November 4-7). *Effect of osteoarthritis on prefrontal cortical activation patterns during downward reaching in older women* [Poster presentation abstract]. 2020 Annual Meeting of the Gerontological Society of America.
 26. Bishnoi, A., Hu, Y., **Hernandez, M. E.** (2021, January 11-13). *Effect of clinical sensory organization test on prefrontal cortical activation among older women with and without osteoarthritis* [Poster presentation abstract]. 2021 Society for Neuroscience Global Connectome: A Virtual Event.
 27. Suresh, A., Brasic, J. R., **Hernandez, M. E.** (2021, January 11-13). *Convolutional neural network predicts impairment scores for repetitive movement measurements* [Poster presentation abstract]. 2021 Society for Neuroscience Global Connectome: A Virtual Event.

CONFERENCE PRESENTATIONS

1. **Hernandez, M. E.**, Murphy, S. L., Ashton-Miller, J. A., & Alexander, N. B. (2006, April 24). *Co-morbidities and physical performance measures affected by self-reported difficulty in downward reaching tasks* [Poster presentation]. Midwest Biomedical Engineering Conference, Ann Arbor, MI, United States.
2. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2006, September 6-9). *Changes in distal postural control accuracy near the limits of the base of support* [Poster presentation]. 30th Annual Meeting of the American Society of Biomechanics, Blacksburg, VA, United States.
3. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2007, November 2). *Theoretical analysis of factors affecting dynamic stability during the momentum arrest*

- phase of a downward reach and pick-up task: simulations with a forward model* [Platform presentation]. 2nd Annual University of Michigan College of Engineering Graduate Symposium, Ann Arbor, MI, United States.
4. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2008, August 5-9). *Effect of age and target width on the speed-accuracy trade-off of center of pressure movements near the anterior margin of the base of support in standing* [Poster presentation]. North American Congress on Biomechanics, Ann Arbor, MI, United States.
 5. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2008, November 7). *An experimental study of postural control during downward reach and pick-up movements: effects of age and limiting the length of the base of support* [Platform presentation]. 3rd Annual University of Michigan College of Engineering Graduate Symposium, Ann Arbor, MI, United States.
 6. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2009, August 26-29). *Control of submaximal center of pressure movements in healthy women: effects of age and movement type* [Poster presentation]. 33rd Annual Meeting of the American Society of Biomechanics, State College, PA, United States.
 7. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2010, April 20-25). *Discrete, accuracy-constrained, center of pressure movements near the limits of the functional base of support: effects of age and movement direction* [Poster presentation]. 20th Annual Meeting of the Society for the Neural Control of Movement, Naples, FL, United States.
 8. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2010, August 18-21). *An experimental study of postural control during downward reach and pick-up movements: Effects of age and limiting the length of the base of support* [Poster presentation]. 34th Annual Meeting of the American Society of Biomechanics, Providence, RI, United States.
 9. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2011, April 26-30). *Forward dynamic model of the momentum arrest phase of whole-body downward reaching movements: Effects of age and functional impairment* [Poster presentation]. 21st Annual Meeting of the Society for the Neural Control of Movement, San Juan, PR, United States.
 10. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2011, August 10-13). *Why do older women utilize slower volitional center of pressure movements when accuracy is constrained? The role of the primary submovement* [Poster presentation]. 35th Annual Meeting of the American Society of Biomechanics, Long Beach, CA, United States.
 11. **Hernandez, M. E.**, Ashton-Miller, J. A., & Alexander, N. B. (2012, August 15-18). *The effect of age and movement direction on rapid and targeted center of pressure submovements while crouching* [Poster presentation]. 36th Annual Meeting of the American Society of Biomechanics, Gainesville, FL, United States.
 12. **Hernandez, M. E.** (2012, August 22-24). *The effect of age and movement direction on rapid and accuracy-constrained center of pressure movements in healthy women* [Paper presentation]. 9th Annual Meeting of the Society for Autonomous Neurodynamics, San Diego, CA, United States.
 13. Lainscsek, C., **Hernandez, M. E.**, Weyhenmeyer, J., Sejnowski, T., & Poizner, H. (2013, February 8). *Non-linear dynamical analysis of human EEG during reaching for and grasping virtual objects* [Poster presentation]. 2013 Temporal Dynamics of Learning

- Center All Hands Meeting, University of California, San Diego, La Jolla, CA, United States.
14. **Hernandez, M. E.**, Snider, J., Stevenson, C., Cauwenberghs, G., & Poizner, H. (2015, March 18-21). *A novel tool for analyzing stochastic postural control dynamics* [Poster presentation]. 2015 Annual Meeting of the Gait & Clinical Movement Analysis Society, Portland, OR, United States.
 15. Walker, R., Chaparro, G., Jean, K., Piton, L., Passarelli, V., & **Hernandez, M.E.** (2015, October 7-10). *Effect of partial body weight support on single leg stance times during self-paced walking in healthy older adults* [Poster presentation]. 2015 Annual Meeting of the Biomedical Engineering Society Annual Meeting, Tampa, FL, United States.
 16. **Hernandez, M. E.**, Chaparro, G., Balto, J., Sandroff, B., & Motl, R. (2016, May 17-20). *The use of augmented reality on a self-paced treadmill to quantify footfall placement variability in older adults with multiple sclerosis* [Paper presentation]. 2016 Annual Meeting of the Gait & Clinical Movement Analysis Society, Memphis, TN, United States.
 17. Motl, R. W., Balto, J. M., **Hernandez, M. E.**, & Sandroff, B. M. (2016, June 1-4). *Physical functioning among older adults with MS: Evidence based on an objective outcome* [Paper presentation]. Annual Meeting of the Consortium of Multiple Sclerosis Centers, National Harbor, MD, United States.
 18. **Hernandez, M. E.**, Chaparro, G., Holtzer, R., Balto, J., Sandroff, B., Izzetoglu, M., & Motl R. (2016, July 2-6). *Brain activation changes during self-paced gait in older adults with multiple sclerosis* [Poster presentation]. 10th Federation of European Neuroscience Societies (FENS) Forum 2016, Copenhagen, Denmark.
 19. **Hernandez, M. E.**, Chaparro, G., Holtzer, R., Izzetoglu, M., & Motl, R. (2017, May 23-25). *Cognitive control of tandem walking in middle-aged to older adults with multiple sclerosis* [Paper presentation]. Annual Meeting of the Gait & Clinical Movement Analysis Society, Salt Lake City, UT, United States.
 20. **Hernandez, M. E.**, Chaparro, G., & Motl, R. (2017, July 23-27). *Gait impairments during self-paced treadmill walking in older adults with multiple sclerosis* [Late Breaker Abstract Poster presentation]. 21st IAGG World Congress of Gerontology and Geriatrics, San Francisco, CA, United States.
 21. **Hernandez, M. E.**, Chaparro, G., Moon, Y., & Sosnoff, J. (2017, August 8-11). *The effect of attention and stance on the rambling and trembling components of postural sway in older adults* [Poster presentation]. 41st Annual Meeting of the American Society of Biomechanics, Boulder, CO, United States.
 22. Kaur, R., Michiels, D., Kaushik, V., Bantchev, M., **Hernandez, M. E.**, & Sowers, R. (2017, October 10-13). *A brain computer interface approach to examine changes in anxiety while walking in a virtually infinite world* [Poster presentation]. 2017 Annual Meeting of the Biomedical Engineering Society, Phoenix, AZ, United States.
 23. Kaur, R., Sowers, R., **Hernandez, M. E.**, & Michiels, D. (2017, October 22-25). *A brain computer interface approach to examine changes in motion patterns while walking in a virtually infinite world* [Poster presentation]. 2017 INFORMS Annual Meeting, Houston, TX, United States.

24. **Hernandez, M. E.**, Sowers, R., Thompson, N., Krishnan, G., & Hsiao-Weckslar, E.T. (2018, May 21-25). *Body-in-the-loop control of soft robotic exoskeletons during virtual manual labor tasks* [Paper presentation]. 2018 IEEE International Conference on Robotics and Automation (ICRA) Workshop on Robotics in Virtual Reality, Brisbane, Australia.
25. Chaparro, G., Singh, D., **Hernandez, M.E.** (2018, October 5-8). *Effects of aerobic fitness on prefrontal brain activation while dual-task walking in older adults* [Poster presentation]. 2018 Society for functional Near-Infrared Spectroscopy Biennial Meeting, Tokyo, Japan.
26. Menon, S., Sowers, R., & **Hernandez, M. E.** (2019, January 4-6). *Automatic Recognition of Multiple Sclerosis through Gait Data using Machine Learning Algorithms* [Poster presentation]. Dynamic Days 2019, International Conference on Nonlinear Dynamics, Chicago, IL, United States.
27. Hu, Y., Kattan, C., Kantos, D., **Hernandez, M. E.** (2019, February 28-March 1). *Upper extremity neuromuscular changes in older adults after Tai Chi practice: a systematic review and meta-analysis* [Paper presentation]. 2019 Midwest Regional Meeting of the American Society of Biomechanics, Dayton, OH, United States.
28. Kaur, R., Zhang, X., Zhou, Y., Shadvani, P., **Hernandez, M. E.**, & Sowers, R. (2019, March 20-23). *Predicting multiple sclerosis from gait patterns* [Poster presentation]. 9th International IEEE EMBS Conference on Neural Engineering, San Francisco, CA, United States.
29. Bishnoi, A., & **Hernandez, M. E.** (2019, March 26-29). *Dual task walking costs in older adults with mild cognitive impairment: systematic review and meta-analysis* [Poster presentation]. 2019 Annual Meeting of the Gait & Clinical Movement Analysis Society, Dallas, TX, United States.
30. Hu, Y., Kattan, C., Kantos, D., & **Hernandez, M. E.** (2019, July 31-August 4). *A systematic review and meta-analysis of upper extremity neuromuscular changes in older adults after Tai Chi practice* [Poster presentation]. XXVII Congress of the International Society of Biomechanics, Calgary, Canada.
31. Sun, R., Ziegelman, L., Yang, S., Kaur, R., Sowers, R., & **Hernandez, M. E.** (2019, October 16-19). *Using virtual reality to examine the correlation between balance function and anxiety in a quiet stance* [Poster presentation]. 2019 Annual Meeting of the Biomedical Engineering Society, Philadelphia, PA, United States.
32. Bishnoi, A., & **Hernandez, M. E.** (2020, May 2-5). *Using Functional Near Infrared Spectroscopy to Determine Dual Task Walking Brain Activation Changes in Older Adults with Neuromuscular disease: Systematic Review and Meta-Analysis* [Poster presentation]. Virtual Annual Meeting of the Cognitive Neuroscience Society.
33. Hu, Y., Bishnoi, A., & **Hernandez, M. E.** (2020, August 4-7). *The Effect of Pain on the Cognitive Control of Balance During the Motor Control Test in Older Women with Osteoarthritis* [Paper presentation]. 42nd Annual Meeting of the American Society of Biomechanics.
34. Wood, T. A., Hill, C. M., Park, D. J., **Hernandez, M. E.**, & Sosnoff, J. J. (2020, August 4-7). *The Potential Implications of Co-Contraction Index of Neck Muscles on Traumatic Brain Injuries* [Poster presentation]. 42nd Annual Meeting of the American Society of Biomechanics.

35. Brasic, J., Harrigan, T., Hwang, B., Mills, K., Pantelyat, A., Bang, J., Syed, A., Vyas, P., Martin, S., Jamal, A., Panaparambil, R., Gaithe, A., Ziegelman, L., & **Hernandez, M. E.** (2020, September 12-16). *Quantitative extremity movement measurement* [Poster presentation]. 2020 International Congress of Parkinson's Disease and Movement Disorders.
36. Hu, Y., Bishnoi, A., & **Hernandez, M. E.** (2021, April 20-22). *Prefrontal cortical activation patterns during dual-task stepping in older women with and without osteoarthritis* [Poster presentation]. 30th Annual Meeting of the Society for the Neural Control of Movement.
37. Bishnoi, A., Hu, Y., & **Hernandez, M. E.** (2021, April 20-22). *Effect of gait variability on prefrontal cortical activation during normal walking among community-dwelling older Women* [Poster presentation]. 30th Annual Meeting of the Society for the Neural Control of Movement.
38. Meade, Z., Likens, A., Kent, J. A., **Hernandez, M. E.**, & Stergiou, N. (2021, April 20-22). *Subthreshold vibration influences the temporal structure of standing in persons with transtibial amputations* [Poster presentation]. 30th Annual Meeting of the Society for the Neural Control of Movement.

INVITED SPEAKING ENGAGEMENTS

Hernandez ME. “Mobility and Fall Prevention in the 21st century,” Invited Talk, Advancing Diversity in Demography of Aging Research (ADAR) Summit, Virtual, November 3, 2020.

Hernandez ME. “Applying machine learning to further our understanding of the brain’s role in preventing falls in older adults,” Invited Talk, Department of Kinesiology and Health Education, University of Texas at Austin, Austin TX, February 5, 2020.

Hernandez ME. “Physiological variability as a marker of anxiety and disease in the control of movement in older adults,” Invited Talk, Department of Biomechanics, University of Nebraska at Omaha, Omaha, NE, December 10, 2019.

Hernandez ME. “Fall prevention,” CRIS Healthy aging center’s aging mastery class, Champaign Public Library, Champaign, IL, October 8, 2019.

Hernandez ME. “Fall prevention,” CRIS Healthy aging center’s aging mastery class, Danville Public Library, Danville, IL, August 22, 2019.

Hernandez ME. “Fall prevention,” CRIS Healthy aging center’s aging mastery class, Clark-Lindsey Retirement Village, Urbana, IL, July 1, 2019.

Hernandez ME. “Feasibility of virtual reality and brain-computer interface technology for neurorehabilitation of fall-related anxiety in frail older adults,” CHART apartment research showcase, Clark-Lindsey Retirement Village, Urbana, IL, June 6, 2018.

Hernandez ME. “Towards a simulation of postural dysfunction in persons with Parkinson’s disease,” Jump Simulation and Education Center ARCHES project showcase at MATTER, Chicago, IL, October 12, 2017.

Hernandez ME. “Brain activation changes during locomotion in middle-aged to older adults with multiple sclerosis,” Invited Talk, Department of Kinesiology and Nutrition, UIC, Chicago, IL, January 27, 2017.

Hernandez ME. “The role of the brain in the prevention of falls,” Invited Talk, Clark-Lindsey Retirement Village, Urbana, IL, July 10, 2015.

Hernandez ME. “The Role of Cognition in the Prevention of Falls in Older Adults,” Invited Talk, Neuropsychology and Cognition Lab, Department of Neurology, Albert Einstein College of Medicine, Bronx, NY, February 26, 2015.

Hernandez ME. “Towards an Understanding of the Brain’s Role in Preventing Falls in Older Adults,” Invited Talk, Department of Kinesiology and Community Health, UIUC, Champaign, IL, November 18, 2013.

Hernandez ME, Mac Donald EF. “Sustainability in the Developed World,” Platform presentation, 3rd Annual Engineers for a Sustainable World Conference, Austin, TX, October 8, 2005.

Schultz W, **Hernandez ME.** “Engineering for Community,” Engineering Education Panel Discussion, 2nd Annual Engineers for a Sustainable World Conference, Palo Alto, CA, October 1, 2004.

Hernandez ME. “Starting an Engineers Without Frontiers Chapter,” Platform Presentation, 1st Annual Engineers Without Frontiers Conference, Ithaca, NY, September 20, 2003.

CAMPUS TALKS

“Overview of existing challenges,” CSBS Human Subjects Research Workshop, January 21, 2021

“Introduction to Mobility and Fall Prevention Research Lab,” WIT-SBS Workshop, June 4, 2020

“Brain activation changes during balance and attention demanding tasks in middle and older-aged adults with multiple sclerosis,” Inaugural Illinois MS Research Day, April 16, 2019.

“Simulation of postural dysfunction in persons with Parkinson’s disease,” 5th Health Care Engineering Systems Symposium, September 17, 2018.

“Brain activation changes during divided attention walking in middle-aged to older adults with multiple sclerosis,” Carle Illinois College of Medicine REACH program seminar, June 25, 2018.

“Virtual reality applications in assessing the effect of anxiety on sensorimotor integration in human postural control,” Motor Control/Biomechanics brownbag series, April 13, 2018.

“Brain activation changes during divided attention walking in middle-aged to older adults with multiple sclerosis,” Cognition, lifespan engagement, aging, and resilience brownbag series, January 25, 2018.

“Simulation of postural dysfunction in persons with Parkinson’s disease,” CHART symposium, November 6, 2017.

“Simulation of postural dysfunction in persons with Parkinson’s disease,” 4th Health Care Engineering Systems Symposium, September 11, 2017.

“Altered PFC activation during locomotion in older adults with multiple sclerosis,” 3rd Health Care Engineering Systems Symposium, September 9, 2016.

“Neural dynamics underlying motor adaptation to object perturbations in Parkinson’s disease,” Neuroscience Program Seminar Series, Neuroscience Program, April 26, 2016.

Hernandez ME, Ekert J. “iPads for Student Feedback and Real World Activities,” Teaching with Technology Brown Bag Series, Center for Innovation in Teaching & Learning, September 9, 2015.

“Motor control alterations in Parkinson’s disease,” General Body Meeting, Undergraduate Neuroscience Society, March 2, 2015.

“Towards an Understanding of the Neural Mechanisms Underlying Human Postural Control,” Chalk Talk, Institute for Neural Computation, May 29, 2014.

“UROP Scholars Graduate Panel,” Panel Discussion, Undergraduate Research Opportunity Program Engineering Peer Group, March 19, 2008.

“Energy Independence and Sustainability,” Panel Discussion, Tau Beta Pi Martin Luther King Lecture Series, January 24, 2008.

“Graduate School Panel,” Panel Discussion, Undergraduate Research Opportunity Program Engineering Peer Group, November 28, 2007.

Hernandez ME, Chang T. “Sustainable Development in Global Health,” Platform Presentation, Undergraduate Research Opportunity Program Research Seminar, December 5, 2006.

Hernandez ME, Clarke J. “Methods in Sustainability,” Platform Presentation, Undergraduate Research Opportunity Program Engineering Peer Group, October 4, 2006.

“Engineers Getting Involved,” Panel Discussion, Tau Beta Pi Martin Luther King Lecture Series, January 25, 2005.

MEDIA COVERAGE

“Machine Learning of Walking Patterns Could Help Predict MS Progression”, Multiple Sclerosis News Today, March 31, 2021.

<https://multiplesclerosisnewstoday.com/news-posts/2021/03/31/machine-learning-walking-gait-patterns-predict-progression-multiple-sclerosis-study/>

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LANGUAGES

Spanish fluency and French competency