

Exponent®
Engineering & Scientific Consulting

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Professional Profile

Dr. Lee's expertise lies in the evaluation of functional and biomechanical outcomes achievable through assistive technologies targeting movement restoration for individuals with neuromotor and musculoskeletal impairment. Examples of technologies Dr. Lee has researched include upper limb prostheses, implantable neural interfaces for prosthetic control, and joint-targeting wearable robots for gait assistance. She has extensive experience conducting human subjects research using 3D motion capture, inertial measurement units (IMUs), electromyography (surface and implantable), force plates, and pressure insoles to quantify changes in biomechanical measures through technology use. Dr. Lee specializes in designing and conducting study protocols for clinical trials to evaluate technology use during real-world tasks and environments.

Prior to joining Exponent, Dr. Lee was a postdoctoral fellow at Harvard University. At Harvard, she investigated how individuals with lower limb impairment respond to different wearable systems for gait assistance in various applications, including use in the lab, remote rehabilitation, and use in the home. Dr. Lee synthesized both objective functional measures and user feedback and worked with a team of engineers, clinicians, and apparel designers to improve the comfort, inclusivity, and usability of these wearable systems.

Dr. Lee completed her PhD in biomedical engineering at University of Michigan. Her doctoral research focused on the assessment of movement control, coordination, and performance in upper limb prosthesis users. Specifically, Dr. Lee quantified how biomechanical measures such as movement quality and inter-joint coordination strategies change due to prosthesis use during fundamental tasks and common activities of daily living. She also investigated how FDA-regulated exploratory surgical procedure can improve prosthetic performance in both virtual tasks and physical real-world tasks.

Academic Credentials & Professional Honors

Ph.D., Biomedical Engineering, University of Michigan, 2023

M.S., Biomedical Engineering, Northwestern University, 2018

B.S., Biomedical Engineering, Northwestern University, 2018

Academic Appointments

Postdoctoral Fellow, Bioengineering, Harvard University, 2023-2025

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Prior Experience

Postdoctoral fellow, Harvard University, 2023-2025

Graduate student research assistant, University of Michigan, 2018-2023

Research assistant, Shirley Ryan AbilityLab (former Rehabilitation Institute of Chicago), 2016-2018

Professional Affiliations

American Society of Biomechanics (2019-)

Publications

Swaminathan K, Choe D, Kim D, Barde F, Baker T, Wendel N, Chin A, Bergamo G, Siviy C, Lee C, Awad L, Ellis T, Walsh C. Multi-modal sensing for propulsion estimation in people post-stroke. IEEE Transactions on Neural Systems & Rehabilitation Engineering (TNSRE) 2025; 33:2273–2285. 10.1109/TNSRE.2025.3577961.

Engdahl SM, Gonzalez MA, Lee C, Gates DH. Perspectives on the comparative benefits of body-powered and myoelectric upper limb prostheses. Journal of Neuroengineering and Rehabilitation 2024; 21:138. https://doi.org/10.1186/s12984-024-01436-4.

Chang C, Lee C, Nuckols RW, Eckert-Erdheim A, Orzel D, Herman M, Traines J, Buckler K, Jayaraman A, Walsh CJ. Successful implementation of a unilateral hip flexion exosuit in rehabilitation for subacute stroke: a feasibility study. Journal of Neuroengineering and Rehabilitation 2024; 21:121. https://doi.org/10.1186/s12984-024-01410-0.

Lee C, Gates DH. Comparison of inter-joint coordination strategies during activities of daily living with prosthetic and anatomical limbs. Human Movement Science 2024; 96:103228. https://doi.org/10.1016/j.humov.2024.103228.

Lee C, Vaskov AK, Davis AJ, Kartes JM, Gates DH. Development and validation of a novel functional assessment for prosthetic grip selection. Journal of Neuroengineering and Rehabilitation 2024; 21:21. https://doi.org/10.1186/s12984-024-01307-y.

Vu PP, Vaskov AK, Lee C, Jilalla RR, Davis AJ, Kung TA, Kemp SWP, Gates DH, Chestek CA, Cederna PS. Long-term upper-extremity prosthetic control using regenerative peripheral nerve interfaces and implanted EMG electrodes. Journal of Neural Engineering 2023; 20(2): 026039. doi: https://doi.org/10.1088/1741-2552/accb0c.

Lee C, Vaskov AK, Gonzalez MA, Vu PP, Davis AJ, Cederna PS, Chestek CA, Gates DH. Use of regenerative peripheral nerve interfaces and intramuscular electrodes to improve prosthetic grasp selection: a case study. Journal of Neural Engineering 2022; 19(6). doi: https://doi.org/10.1088/1741-2552/ac9e1c.

Lee C, Gonzalez MA., Kang J, Gates DH. Temporal and spatial goal-directed reaching in upper limb prosthesis users. Experimental Brain Research 2022; 240(11):3011–3021. https://doi.org/10.1007/s00221-022-06476-7.

Gonzalez MA, Bismuth A, Lee C, Gates DH. Artificial referred sensation in upper and lower limb prosthesis users: a systematic review. Journal of Neural Engineering 2022; 19(5). doi: https://doi.org/10.1088/1741-2552/ac8c38.

Engdahl SM, Lee C, Gates DH. A comparison of compensatory movements between body-powered and

myoelectric prosthesis users during activities of daily living. Clinical Biomechanics 2022; 97:105713. doi: 10.1016/j.clinbiomech.2022.105713.

Lee C, Engdahl SM, Riegger A, Davis A, Kelly BM, Gates DH. Employment status in individuals with upper limb amputation: a survey of current trends. Journal of Prosthetics and Orthotics 2022; 34(2):79–88. doi: 10.1097/JPO. 0000000000000366.

Gonzalez MA., Lee C, Kang J, Gillespie RB, Gates DH. Getting a grip on the Impact of Incidental Feedback from Body-Powered and Myoelectric Prostheses. IEEE Transactions on Neural Systems and Rehabilitation Engineering 2021; 29:1905–1912. doi: 10.1109/TNSRE.2021.3111741.

Presentations

Lee C, Chang C, Wendel N, Baker T, Chin A, Porciuncula F, Ellis T, Walsh C. Spatiotemporal and biomechanical effect of a bilateral hip-flexion exosuit during turning in individuals with Parkinson's disease. American Society of Biomechanics annual meeting, Madison, WI, Aug 5-8, 2024.

Lee C, Davis AJ, Kartes J, Vaskov AK, Gates DH. The coffee task: an assessment of multi-grip upper limb prosthetic performance. American Orthotic and Prosthetic Association National Assembly, Indianapolis, IL, Sep 6-9, 2023.

Lee C, Vaskov AK, Gonzalez MA, Davis AJ, Chestek CA, Gates DH. A novel assessment of multi-grasp prosthetic control. American Academy of Orthotics and Prosthetics, Atlanta, GA, March 2-5, 2022.

Lee C, Engdahl SM, Gates DH. Compensatory movements in body-powered and myoelectric prosthesis users during activities of daily living. American Academy of Orthotics and Prosthetics, Atlanta, GA, March 2-5, 2022.

Lee C, Vaskov AK, Vu PP, Davis AJ, Cederna PS, Chestek CA, Gates DH. Intramuscular electrodes and regenerative peripheral nerve interfaces can reduce cognitive effort during prosthetic grip selection. International Society for Prosthetics and Orthotics 18th World Congress (virtual), Nov 1-4, 2021.

Lee C, Gonzalez MA, Mulligan MB, Kang J, Gates DH. Movement control of upper limb prosthesis users during goal-directed reaching. 45th Annual Meeting of the American Society of Biomechanics (virtual), Aug 10-13, 2021.

Lee C, Vaskov A, Vu P, Davis A, Gillespie RB, Kemp S, Kung T, Chestek C, Cederna P, Gates DH. The performance of implantable electrodes on the control of a myoelectric prosthesis over one year post-implantation. 44th Annual Meeting of the American Society of Biomechanics, Atlanta, GA, (virtual), Aug 4-7, 2020.

Lee C, Gonzalez M, Kang J, Gates DH. Accuracy and smoothness of goal-directed reaching movements in upper limb prosthesis users. 27th Annual Congress of the International Society of Biomechanics/43rd Annual Meeting of the American Society of Biomechanics, Calgary, Canada, Jul 31-Aug 4, 2019.

Peer Reviews

Applied Ergonomics

IEEE Transactions on Neural Systems and Rehabilitation Engineering

Journal of Neural Engineering

Nature Communications