



Exponent®
Engineering & Scientific Consulting

Evan Dooley

Associate | Biomechanics

Phoenix

+1-623-587-6757 | edooley@exponent.com

Professional Profile

Evan Dooley's expertise is in human motion biomechanics., primarily using He has implemented various techniques including motion capture, force plates, load cells, electromyography (EMG), and oxygen consumption along with human modeling approaches to investigate the influence of devices and the integration of clinical interventions (assistive devices, surgery, rehabilitation) on musculoskeletal movement patterns and performance.with models of human movement, with the aim being to understand and optimize functional outcomes for individuals with musculoskeletal movement pathologies. He has extensive experience conducting biomechanical evaluations on clinical interventions, validating the use of predictive models, and analyzing kinematic and kinetic data to assess complex full-body movements for populations ranging from pathologic and typically developing children to elite athletes.

Evan's experience includes the collection and analysis of biomechanical data using high-speed motion capture, electromyography (EMG), mechanical testing systems (MTS), wearable force- and pressure-measuring sensors, and metabolic measurement systems. He also has broad experience in designing and conducting user studies with diverse demographics, ranging from including healthy adults, to competitive athletes to neurologically impaired children with Cerebral Palsy, and collegiate athletes in order to evaluate varied facets of the dynamics of human performance. Additionally, Evan has broad experience developing models of human movement to investigate real-world scenarios, such as how much motion is provided by ankle replacements versus ankle fusions, which surgical method of stabilizing bones in the hand gives the patient the most mobility in their wrist, and how beneficial are knee-support devices to baseball catchers' knees.

Prior to joining Exponent, Evan was a Graduate Researcher in the Motion Analysis and Motor Performance (MAMP) Lab at the University of Virginia. His research focused on developing a predictive simulation framework to determine the most useful way for a powered posterior walker to apply force to its user to improve the efficiency of their walking, while maintaining the stability benefits of the device.

Academic Credentials & Professional Honors

B.S., Biomedical Engineering, University of Virginia, 2017

UVA MAE Outstanding Graduate Leadership and Diversity Award, 2023

American Society of Biomechanics President's Choice Service Award, 2022

Virginia Engineering Foundation Fellowship, 2021

Sture G. Olsson Fellowship in Engineering, 2020

The Raven Society at the University of Virginia, Inducted 2020

Prior Experience

Graduate Researcher, University of Virginia Motion Analysis & Motor Performance Lab, 2017-2023

Teaching Assistant, University of Virginia Mechanical & Aerospace Engineering, 2018-2020

Professional Affiliations

American Society of Biomechanics (ASB)

- Executive Board Student Representative (August 2020 to September 2022)

Black Biomechanists Association (BBA)

International Society of Biomechanics (ISB)

Gait and Clinical Movement Analysis Society (GCMAS)

American Association of Snowboard Instructors (AASI)

Publications

Bodkin SG, Pethick JT, Dooley EA, Russell SD, Hart JM. Torque complexity of maximal knee extensor isometric contraction in individuals following anterior cruciate ligament reconstruction. *Clinical Biomechanics* (Bristol, Avon). 2023;104:105932. doi:10.1016/j.clinbiomech.2023.105932

Hassanzadeh, H., Raso, J., Kamalopathy, P., Dooley, E., Puvanesarajah, V., Labaran, L., Solomon, E., Mitchell, B.A., Russell, S., (2023). Improvement of postural stability and gait velocity after cervical decompression surgery in patients with cervical spondylotic myelopathy. *Journal of neurosurgery. Spine*, 1–8.

Hassanzadeh, H., Bell, J., Dooley, E., Puvanesarajah, V., Kamalopathy, P., Labaran, L., Shimer, A., Shen, F., Russell, S., (2022). Evaluation of Gait and Functional Stability in Preoperative Cervical Spondylotic Myelopathy Patients. *Spine*. 47(4):317-323.

Hess, D.E, Archual, A., Burnett, Z.R., Prakash, H.K., Dooley, E., Russell, S., Freilich, A.M., Dacus, A.R., (2021). Motion and Strength Analysis of 2-Tine Staple and K-Wire Fixation in Scapholunate Ligament Stabilization in a Cadaver Model. *Journal of Hand Surgery*. 3(2): 67-73.

Dooley, E., Carr, J., Carson, E., Russell, S.D., 2019. The Effects of Knee Support on the Sagittal Lower-Body Joint Kinematics and Kinetics of Deep Squats. *Journal of Biomechanics*. 82, 164-170.

Dienes, J.A., Hu, X., Janson, K.D., Slater, C., Dooley, E., Christ, G.J. Russell, S.D., 2019. Analysis and Modeling of Rat Gait Biomechanical Deficits in Response to Volumetric Muscle Loss Injury. *Frontiers in Bioengineering and Biotechnology*. 7:146. doi: 10.3389/fbioe.2019.00146

Presentations

Dooley, E., Knaus, K., Lehmann, A., Russell, S.D. How Can Lower Body Joint Work Be Used to Estimate Energetic Cost of Walking? 46th Annual Meeting of the American Society of Biomechanics, Knoxville, TN,

August 2023. (Podium Presentation)

Dooley, E., Russell, S.D. Predicting Performance Effects of Applied Propulsive Force in Over-Ground Walking. 46th Annual Meeting of the American Society of Biomechanics, Knoxville, TN, August 2023. (Poster Presentation)

Dooley, E., Knaus, K., Lehmann, A., Russell, S.D. Can we use mechanical work to predict the energetic cost of walking? Dynamic Walking 2023, Munich, BY, Germany, June 2023. (Accepted for Oral Presentation)

Dooley, E., Russell, S.D. Predictive Simulation Framework to Develop Active Posterior Walker to Aid People with Pathologic Gait. UVA Mechanical & Aerospace Engineering Student Seminar Series, Charlottesville, VA, March 2023. (Invited Podium Presentation)

Dooley, E., Russell, S.D. Method for Predicting 3D Ground Reaction Forces under Various Loading Patterns, 5th Meeting of the North American Congress on Biomechanics, Ottawa, ON, Canada, August 2022. (Poster Presentation)

Dooley, E., Banks, C., Seymore, K. Diversifying Your Workplace: Student Voices & Leadership, 5th Meeting of the North American Congress on Biomechanics, Ottawa, ON, Canada, August 2022. (Invited Workshop Presentation & Discussion Lead)

Johnson, A., Breen, S., Ringleb, S., Dooley, E. Diversifying Your Workplace: LGBTQIA+ & Gender Non-Conforming Barriers of Inclusion, 5th Meeting of the North American Congress on Biomechanics, Ottawa, ON, Canada, August 2022. (Invited Workshop Presentation)

Dooley, E., Russell, S.D. Lower Body Joint Moments Reduced while Walking with Posterior Walker, 45th Annual Meeting of the American Society of Biomechanics, Atlanta, GA, August 2021. (Poster Presentation)

Mead, J., Dooley, E., Park, J.S., Russell, S.D. Internal Foot Motion of TAA Candidates of Four Ambulatory Exercises, 45th Annual Meeting of the American Society of Biomechanics, Atlanta, GA, August 2021. (Poster Presentation)

Dooley, E., Lehmann, A., Tumperi, M., Russell, S.D. Predicting Gait Events from Handle Force in an Instrumented Posterior Walker, Virtual XXVIII Congress of the International Society of Biomechanics, Stockholm, Sweden, July 2021. (Poster Presentation & Lightning Talk (https://youtu.be/_Y4yKdkp0kU))

Dooley, E., Hassanzadeh, H., Russell, S.D. The Effect of Cervical Spondylotic Myelopathy on Dynamic Stability of Human Gait, 44th Annual Meeting of the American Society of Biomechanics, Atlanta, GA, August 2020. (Virtual Poster)

Dooley, E., Spivey, W., Hicks, W.B., Russell, S.D. Comparison of Three Unique Foot Models Over One Step, 44th Annual Meeting of the American Society of Biomechanics, Atlanta, GA, August 2020. (Virtual Poster)

Mead, J., Dooley, E., Hadeed, M., Yarboro, S., Russell, S.D. The Effect of Antegrade vs. Retrograde Femoral Nailing after Traumatic Femur Fracture on the Kinematics and Kinetics of the Lower Body Through Six-Months of Recovery, 44th Annual Meeting of the American Society of Biomechanics, Atlanta, GA, August 2020. (Virtual Poster)

Dooley, E., Hicks, W.B., Park, J.S., Cooper, M.T., Perumal, V., Russell, S.D. Differences in Over-Ground Walking and Stair Climbing Between Ankle Arthroplasty Candidates and Controls, 2020 Gait & Clinical Movement Analysis Society Annual Conference, West Chester, PA, June 2020. (Accepted Poster)

Dooley, E., Hicks, W.B., Park, J.S., Cooper, M.T., Perumal, V., Russell, S.D. Preliminary Differences in

Over-Ground Walking and Stair Climbing Between Ankle Arthroplasty Candidates and Controls, University of Virginia Engineering Research Symposium 2020, Charlottesville, VA, April 2020. (Poster Finalist)

Dooley, E., Andrew, N., Hassanzadeh, H., Russell, S. D. The Effect of Spinal Decompression Surgery on the Postural and Dynamic Stability of Cervical Myelopathy Patients, XXVII Congress of the International Society of Biomechanics, Calgary, Alberta, Canada, August 2019. (Podium Presentation)

Dooley, E., Andrew, N., Hassanzadeh, H., Russell, S. D. The Effect of Spinal Decompression Surgery on the Gait Efficiency and Dynamic Stability of Cervical Myelopathy through Six-Month Follow-Up, Orthopaedic Research Society 2019 Annual Meeting, Austin, TX, February 2019. (Poster)

Dooley, E., Carr, J., Carson, E., Russell, S.D. The Effects of Knee Loads and Motions of Baseball Catchers in Deep Squats, Pediatric Research in Sports Medicine 6th Annual Meeting, Atlanta, GA, January 2019. (Invited Podium Presentation)

Russell, S. D., Dooley, E., Abel, M. Use of the Motion Lab for Evaluation & Discovery, Function for Life in Pediatrics (FLiP) 24th Annual Conference, December 2018. (Invited Podium Presentation)

Dooley, E., Horowitz, J., Hassanzadeh, H., Russell, S.D. The Effect of Spinal Decompression Surgery on the Gait Efficiency and Balance of Cervical Myelopathy Patients through Six-Month Follow-Up, 42nd Annual Meeting of the American Society of Biomechanics, Rochester, MN, August 2018. (Poster)

Dooley, E., Tondreau, C., Horowitz, J., Newman, R., Hassanzadeh, H., Russell, S.D. The Effect of Spinal Decompression Surgery on the Gait Efficiency and Balance of Cervical Myelopathy Patients, 2018 Gait & Clinical Movement Analysis Society Annual Conference, Indianapolis, IN, May 2018. (Podium Presentation)

Dooley, E., Carr, J., Carson, E., Russell, S.D. The Effects of Knee Support on the Lower Body Joint Loads and Motions of Baseball Catchers in Deep Squats, 41st Annual Meeting of the American Society of Biomechanics, Boulder, CO, August 2017. (Poster)

Dooley, E., Carr, J., Carson, E., Russell, S.D. The Effects of Knee Loads and Motions of Baseball Catchers in Deep Squats, 2017 Gait & Clinical Movement Analysis Society Annual Conference, Salt Lake City, UT, May 2017. (Podium Presentation)

Peer Reviews

Clinical Biomechanics, 2023 - Present

Gait & Posture, 2022 - Present