

Zane Colvin

PhD

Staff Consultant



Dr. Zane Colvin is a Staff Consultant at Engineering Systems Inc. (ESi), where he works as part of the Biomechanics and Safety group.

Dr. Colvin has over five years of laboratory research experience investigating how able-bodied people and those with lower limb disability interact with devices in their everyday life and sport through use of research tools, including surface electromyography, metabolic rate testing, motion capture systems, instrumented treadmills, and materials testing machines.

At ESi, Dr. Colvin applies his expertise to a range of investigative scenarios, including motor vehicle accidents, slips, trips, and falls, injury causation, safety analyses, and consumer product and premises liability claims.

Before joining ESi, Dr. Colvin earned his PhD in Integrative Physiology at the University of Colorado Boulder, conducting research in the Applied Biomechanics Lab. For his dissertation research, Dr. Colvin investigated the effects of device configuration on the biomechanics and physiology of people with lower limb disability during walking and skating.

Dr. Colvin has presented his research at national and international conferences and is published in peer-reviewed scientific journals and conference proceedings, including the Journal of the Royal Society Open Science.

Education

PhD, Integrative Physiology, Biomechanics. University of Colorado Boulder. 2024

MS, Integrative Physiology, Biomechanics. University of Colorado Boulder. 2021

BA, Integrative Physiology. University of Colorado Boulder. 2019

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ESi Denver

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Areas of Specialization

- Biomechanical Engineering
- Life Sciences
- Sports & Fitness Equipment
- Gait Biomechanics
- Slips, Trips & Falls
- Surface Electromyography (EMG)
- Prosthetics & Orthotics
- Materials Testing
- Experimental Testing
- Statistical Analysis

Positions Held

Engineering Systems Inc., Denver, Colorado

- Staff Consultant, 2024 – Present

University of Colorado, Boulder, Colorado

- Lead Graduate Teaching Assistant, 2023–2024
- Clinical Joint Strength Consultant, 2021–2024
- Graduate Research Assistant, 2019–2024

CU Sports Medicine and Performance Center, Boulder, Colorado

- Sport Physiologist, 2017–2019

Peak Physical Therapy and Wellness, Englewood, Colorado

- Exercise Physiologist, 2016–2017

Professional Affiliations/Honors

American Society of Biomechanics

- Member, 2020–2024

Continuing Education

- Passenger Restraint Safety Systems, Institute of Police Technology & Management (IPTM), 2025
- Traffic Crash Reconstruction for Engineers, Northwestern University, 2026

Publications

“Greater Than Recommended Stiffness and Power Setting of a Stance-Phase Powered Leg Prosthesis Can Improve Step-to-Step Transition Work and Effective Foot Length Ratio During Walking in People with Transtibial Amputation,” J.R. Tacca, **Z.A. Colvin**, and A.M. Grabowski, *Frontiers in Bioengineering and Biotechnology*, pp. 1–16. doi:10.3389/fbioe.2024.1336520, July 2024.

“Low-Profile Prosthetic Foot Stiffness Category and Size, and Shoes Affect Axial and Torsional Stiffness and Hysteresis,” J.R. Tacca, **Z.A. Colvin**, and A.M. Grabowski, *Frontiers in Rehabilitation Sciences*, Vol. 5, pp. 114, doi:10.3389/fresc.2024.1290092, February 2024.

“Effects of Powered Versus Passive-Elastic Ankle Foot Prostheses on Leg Muscle Activity During Level, Uphill and Downhill Walking,” **Z.A. Colvin**, J.R. Montgomery, and A.M. Grabowski, *Royal Society Open Science*, Vol. 9, doi:10.1098/rsos.220651, 2022.

Presentations

“The Effects of Stiffness and Power of an Ankle-Foot Prosthesis on Metabolic Power During Walking,” **Z.A. Colvin**, J.R. Tacca, and A.M. Grobowski, Veterans Affairs Research Day Poster Competition, 2023.

“Is Leg Muscle Strength Correlated with Metabolic Power in People with Unilateral Transtibial Amputation?” **Z.A. Colvin**, J.R. Tacca, and A.M. Grabowski, North American Congress on Biomechanics Conference, 2022.

“Is Leg Muscle Strength Correlated with Metabolic Power in People with Unilateral Transtibial Amputation?” **Z.A. Colvin**, J.R. Tacca, and A.M. Grabowski, Rocky Mountain American Society of Biomechanics, 2022.

“Optimized Stiffness and Power of an Ankle-Foot Prosthesis May Reduce Metabolic Power During Walking,” **Z.A. Colvin**, J.R. Tacca, and A.M. Grabowski, American Society of Biomechanics Conference, Virtual, 2021.

“Leg Muscle Activation Using a Powered or Passive Ankle Foot Prosthesis During Level and Sloped Walking,” **Z.A. Colvin** and A.M. Grabowski, American Society of Biomechanics Conference, Virtual, 2020.