Katie R. G. Zilevicius
PhD
Staff Consultant, Biomechanics

Dr. Katie Geary Zilevicius is a biomechanical engineer at Engineering Systems Inc. (ESi) based in the New Jersey office. Dr. Zilevicius has related expertise in injury biomechanics, blast and ballistics injury, computational modeling, experimental design, and mechanical testing. Dr. Zilevicius provides injury and biomechanical analysis for slips and falls, vehicular accidents, industrial accidents, product liability claims, premise liability claims, and worker's compensation claims. She is certified in the use of the FARO Focus 3D laser scanner, and is proficient in the use of its post-processing software including FARO Scene.

Prior to joining ESi, Dr. Zilevicius earned her Ph.D. in Biomedical Engineering from the Virginia Tech – Wake Forest School of Biomedical Engineering and Sciences while conducting research in the Center for Injury Biomechanics. Her doctoral research focused on the design and validation of human surrogates for the study of blast injuries and evaluation of personal protective equipment. Additionally, she conducted research on injury to the human cervical spine, torso, and rib cage, including investigations into traumatic, blast and ballistic injury. She has previously conducted research supporting the US Naval Medical Research Unit's Combat, the U.S. Food and Drug Administration.

Dr. Zilevicius has presented her research at international conferences and is published in peer-reviewed scientific journals and conference proceedings including Annals of Biomedical Engineering, the Biomedical Engineering Society, the Orthopedic Research Society, and the International Research Council on Biomechanics of Injury.

Education

PhD, Biomedical Engineering. Virginia Tech. (Dean's List) 2026

BS, Bioengineering. University of Maryland. (Dean's List) 2018

Licenses and Certifications

- Certified FARO Focus Scanner User

Contact Information

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Lincoln Park, NJ 08035

Areas of Specialization

- Spine Biomechanics
- Blast Biomechanics
- Impact Biomechanics
- Injury Causation
- Slips, Trips and Falls
- Consumer Products
- Workers' Compensation
- Motor Vehicle Accidents
- Occupant Kinematics
- Thoracic Injury
- Concussion/TBI
- Diagnostic Imaging
- Experimental Testing
- Human Injury Analysis
- Failure Analysis
- Computational Modeling
- Statistical Analysis
- FARO Laser Scanning

Positions Held

Center for Injury Biomechanics, Wake Forest School of Medicine, Winston Salem, NC

- Graduate Research Associate, 2022 – 2025

Naval Medical Research Unit via Leidos, Inc., San Antionio, TX

- Biomedical Research Engineer, 2019 – 2022

Department of Applied Mechanics, U.S. Food and Drug Administration, Silver Spring, MD

- ORISE Fellow, Biomechanical Engineering, 2018 – 2019

Cardiology Bioengineering Laboratory, Johns Hopkins Hospital, Baltimore, MD

- Engineering Technician, 2017 – 2018

Professional Affiliations/Honors

International Research Council on Biomechanics of Injury

- Travel Grant, 2025

Injury Biomechanics Symposium

- Travel Grant, 2025

Biomedical Engineering Society (BMES)

Orthopedic Research Society (ORS)

Society of Women Engineers (SWE)

Publications

"Design and Validation of a Stiffness-Matched Cervical Spine Surrogate. Annals of Biomedical Engineering, 1-11". **Zilevicius, K. R.,** Hederick, M. K., von Kleeck, B. W., Coltoff, E. C., Roy, T. J., Wilbur, J. C., ... & Brown, P. J., 2026.

"Multimodal Detection of Pain and Anticipation Anxiety from Ultra-Short Duration Wearable Sensors Measurements". Peitzsch, A. G., **Geary, K.,** Kong, Y., Posada-Quintero, H., Havard, D., D'Angelo, W. R., & Chon, K. H., Sensors, 26(10), 318, 2026.

Presentations

"Experimental validation of a computational design: A human body model inspired cervical spine surrogate". IRCOBI 2025, Vilnius, Lithuania. **Zilevicius, K.R. G.,** Roy, T., Wilbur, J., Graybill, B., Gayzik, F. S., Brown, P. (2025).

“Design of a topology optimized human rib cage surrogate for blast testing”. Biomedical Engineering Society Conference 2024, Baltimore, MD. **Zilevicius, K. R. G.**, Hezrony, B., von Kleeck, B. W., Roy, T., Graybill, B., Wilbur, J., Gayzik, F. S., Brown, P. J. (2024).

“A Human Body Model Inspired Cervical Spine Surrogate: A Pilot Study”. 52nd NHTSA Workshop on Human Subjects for Biomechanical Research, Columbus, OH. **Zilevicius, K. R. G.**, Hederick, M. K., von Kleeck, B. W., Coltoff, E. C., Roy, T., Graybill, B., Wilbur, J., Gayzik, F. S., Brown, P. J. (2024).

“Examining thoracic and abdominal aorta rupture risk and directional dependency using computational human body models”. Military Health Science Research Symposium, Orlando, FL. von Kleeck, B. W., **Zilevicius, K. R. G.**, Brown, P. J., Gayzik, F. S., Graybill, B., Wilbur, J. (2024).

“Electrodermal Activity Sensing for Quantitative Pain Sensing. Military Health Science Research Symposium”, Orlando, FL. **Geary, K. R.**, Peitzch, A., Speaker, S., Villanueva, J., D’Angelo, W., Posada-Quintera, H., Chon, K., Havard, D. B. (2022).