Exponent®
Engineering & Scientific Consulting

Yashar Aucie, Ph.D., P.E.

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Professional Profile

Dr. Aucie investigates injury mechanisms associated with a wide variety of scenarios including motor vehicle collisions, pedestrian impacts, workplace incidents, and slip/trip/fall events. He also evaluates hazard patterns associated with consumer products, with both current designs as well as alternative designs.

Dr. Aucie evaluates occupant kinematics in automobile collisions, including frontal, rear-end, lateral impacts, and sideswipes, as well as rollovers to understand potential injury mechanisms. He also analyzes events to determine whether the mechanisms of acute injury are present in an event and whether an event can be causally related to specific pathologies. Dr. Aucie also designs and executes human experiments to quantify and interpret human movement data in real world environments which includes collecting, analyzing, and interpreting data from inertia measurement units (IMUs), multi-camera motion capture systems, electromyography (EMG), etc.

Prior to joining Exponent, Dr. Aucie was a Graduate Assistant at the University of Pittsburgh Department of Bioengineering, working in the Sensorimotor learning laboratory. During his time in this laboratory, Dr. Aucie employed unique experimental methods by using force-plate data to assess the transfer of walking movement from a treadmill to overground. Furthermore, he implemented a novel approach to count steps during overground walking in real time with a motion capture system, allowing for better control for uniform data collection. He gained extensive experience in the use of motion capture systems, force-plates, EMG, IMUs, exoskeletons, and mobile respirometry systems. Dr. Aucie has led more than 200 sessions of human testing on young and older healthy adults as well as post-stroke patients.

Academic Credentials & Professional Honors

Ph.D., Bioengineering, University of Pittsburgh, 2021

B.S., Bioengineering, University of Pittsburgh, 2015

Graduate Assistantships in Areas of National Need (GAANN) Fellowship Award, 2017-2019

Outstanding Biomechanics Student of the Year, Department of Bioengineering, Committee of Biomechanics, University of Pittsburgh, 2015

Licenses and Certifications

Professional Engineer Mechanical, California, #42636

Professional Engineer Mechanical, New York, #111984

Certified Crash Data Retrieval (CDR) Technician

Certified XL Tribometrist (CXLT)

Prior Experience

Graduate Research Assistant, Sensorimotor Learning Laboratory, Department of Bioengineering, University of Pittsburgh, 2015-2021

Undergraduate Research Assistant, Biodynamics Laboratory, Department of Orthopaedic Surgery, University of Pittsburgh Medical Center, 2013-2015

Professional Affiliations

Society of Automotive Engineers (member), 2025-Present

American Society of Biomechanics (member), 2021-Present

Publications

Barri, K., Zhang, Q., Swink, I., Aucie, Y., Holmberg, K., Sauber, R., ... & Alavi, A. H. (2022). Patient-Specific Self-Powered Metamaterial Implants for Detecting Bone Healing Progress. Advanced Functional Materials, 32(32), 2203533.

Aucie, Y., Zhang, X., Sargent, R., & Torres-Oviedo, G. (2020). Motorized shoes induce robust sensorimotor adaptation in walking. Frontiers in Neuroscience, 14, 174.

Nguyen, T. M., Jackson, R. W., Aucie, Y., de Kam, D., Collins, S. H., & Torres-Oviedo, G. (2020). Self-selected step length asymmetry is not explained by energy cost minimization in individuals with chronic stroke. Journal of NeuroEngineering and Rehabilitation, 17(119), 1-16.

Anderst, W. J., & Aucie, Y. (2017). Three-dimensional intervertebral range of motion in the cervical spine: Does the method of calculation matter?. Medical Engineering & Physics, 41, 109-115.

Presentations

Alavi A. H., Chakrabartty S., Aucie. Y. (2022). Advances in Smart Orthopedic Implants with Diagnostic Capabilities. Biomedical Engineering Society, San Antonio, TX., Podium Presentation

Aucie Y., Zhang X, Sargent R., and Torres-Oviedo G. (2018). Innovative shoes induce locomotor learning correcting step asymmetry. Motor Learning Workshop, Pittsburgh, PA., Poster Presentation

Aucie, Y., Zhang, X., Sargent, R., & Torres-Oviedo, G. (2017). Locomotor learning "in the wild": motorized shoes can induce split-belt-like adaptation over ground. Society for Neuroscience Conference, Washington, D.C., Poster presentation

Aucie Y., Zhang X., Sargent R., and Torres-Oviedo, G. (2017) Innovative shoes induce locomotor learning correcting step asymmetry. 3rd Brain Day Conference, Pittsburgh PA., Poster Presentation

Aucie Y., Zhang X, Sargent R., and Torres-Oviedo G. (2017). Innovative shoes induce locomotor learning correcting step asymmetry. Rehabilitation Institute Research Day. Pittsburgh, PA. (FIRST PLACE AWARD), Poster Presentation

Aucie, Y., & Anderst, W. J. (2015) The effect of joint angle calculation method on intervertebral range of

motion in the lower cervical spine. Orthopedic Research Society (ORS) Conference Annual Meeting, Las Vegas, Nevada, Podium presentation

Additional Education & Training

Vehicle Crash Reconstruction: Principles and Technology, SAE International, 2024

Editorships & Editorial Review Boards

Ingenium Journal (University of Pittsburgh Swanson School of Engineering)