Exponent®
Engineering & Scientific Consulting

Pegah Jamali, Ph.D.

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Professional Profile

Dr. Jamali's expertise is in human movement biomechanics, neuromechanical control, and computational modeling, with a focus on gait and stability, fall risk mitigation, and obstacle negotiation. Her work includes evaluation of human kinematics and dynamics in slip, trip, and fall events and assessment of occupant kinematics and injury potential in motor vehicle collisions. She applies integrated experimental and analytical approaches, including motion capture, cognitive assessment, inverse dynamics, and sensitivity analyses to evaluate how physiological and neurocognitive changes influence movement safety.

Dr. Jamali has extensive experience validating biomechanical models of human movement and loading, evaluating the accuracy and sensitivity of external loading interactions on model performance, and assessing model robustness to physiological variability. Her doctoral research examined neuromechanical adaptations during pregnancy, revealing how changes in obstacle perception and avoidance strategies were associated with trip and fall risk. Her work demonstrated that cognitive and visual engagement, along with physical capacity, play a critical role in safe obstacle negotiation as biomechanical demands change.

Prior to joining Exponent, Dr. Jamali was a research assistant in the Maternal Orthopedics and Mechanics (MOM) Lab at Washington State University. Through her research, Dr. Jamali developed a validated foundation for applying musculoskeletal modeling approaches to pregnant populations. Her research provides clinically relevant insight into fall mechanisms and injury risk, with applications in injury prevention and movement safety.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, Washington State University, 2025

B.Sc., Biomedical Engineering, Amirkabir University of Technology, Iran, 2020

Voiland College of Engineering and Architecture Research Excellence Award, 2024

School of Mechanical and Materials Engineering Scholarship Award for Academic Excellence, 2024

Graduate and Professional Student Association Dissertation Grant, 2024

Graduate and Professional Student Association Travel Award, 2024

American Society of Biomechanics Travel Award, 2021

Academic Appointments

Lead Lab Instructor, Department of Kinesiology and Educational Psychology, Washington State University, 2021–2025

Prior Experience

Research Assistant, Maternal Orthopedics & Mechanics (MOM) Lab, Washington State University, 2021–2025

Lead Lab Instructor, Department of Kinesiology and Educational Psychology, Washington State University, 2021–2025

Ergonomics Consulting Job Shadow, ErgoFit Consulting, Summer 2025

Research Assistant, Biomechanics & Sports Engineering Lab, Amirkabir University of Technology, 2018–2020

Biomedical Engineering Intern, Ador Orthotics Company, Summer 2018

Professional Affiliations

Graduate and Professional Student Association VCEA Senator, Washington State University, 2023–2025

American Society of Biomechanics Member, 2021–2023, 2025

Publications

Jamali P, Catena RD. Gait joint moment sensitivity to potential errors in gestational segment inertial parameters. Journal of Biomechanics 2025; 195:113128.

Jamali P, Chou L-S, Catena R. Whole-cycle and time-specific validation of a GUI-based ground reaction force estimation tool for clinical gait analysis without a force plate. Journal of Medical Engineering and Physics 2025; 141:104366.

Moore J, Catena R, Fournier L, Jamali P, McMeekin O, Stuart S, Walker R, Salisbury T, Godfrey A. Enhancing fall risk assessment: instrumenting vision with deep learning during walks. Journal of NeuroEngineering and Rehabilitation 2024; 21(1):106.

Jamali P, Kinkade KM, Ericson A, Tyler B, Prashad S, Catena RD. Different neurocognitive controls modulate obstacle avoidance through pregnancy. Experimental Brain Research 2024; 242(2):505–519.

Presentations

Jamali P, Catena RD. Independent analysis of Motion Analysis Corp. virtual GRF calculation. American Society of Biomechanics, Madison WI, 2024. (Awarded “Graduate and Professional Student Association Travel Award”).

Jamali P, Catena RD. Accuracy of a virtual ground reaction force calculation in gait. Northwest Biomechanics Symposium, Eugene, OR, 2024.

Jamali P, Kinkade KM, Ericson A, Tyler B, Prashad S, Catena RD. Different neurocognitive controls modulate obstacle avoidance through pregnancy. Northwest Biomechanics Symposium, Seattle, WA, 2023.

Jamali P, Kinkade KM, Catena RD. Perception and proprioception changes as potential factors for

tripping during pregnancy. International Society of Posture and Gait Research 2022, World Congress, Montréal, 2022.

Jamali P, Kinkade KM, Catena RD. Obstacle avoidance changes during pregnancy. Northwest Biomechanics Symposium, Pullman, WA, 2022.

Jamali P, Kinkade KM, Catena RD. Tripping during pregnancy: failure to perceive the environment or the body? American Society of Biomechanics 45th virtual meeting, 2021. (Awarded “ASB Travel Award”).

Peer Reviews

Gait & Posture (Elsevier)

Journal of Biomechanics (Elsevier)