

Mohsen Alizadeh Noghani

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Education

Ph.D. in Mechanical Engineering University of Notre Dame	2026 (expected) Notre Dame, U.S.
M.Sc. in Applied & Computational Mathematics & Statistics University of Notre Dame	2025 Notre Dame, U.S.
M.Sc. in Mechanical Engineering University of Maine	2021 Orono, U.S.
B.Sc. in Mechanical Engineering Ferdowsi University of Mashhad	2018 Mashhad, Iran

Publications

Mohsen Alizadeh Noghani, Sebastian Green, Edgar Bolívar-Nieto. (2025). **Whole-body optical marker and ground reaction force data of healthy humans performing non-cyclic activities**. *Scientific Data* [DOI]

Mohsen Alizadeh Noghani, Edgar Bolívar-Nieto. (2025). **Predicting center of mass position in non-cyclic activities: The influence of acceleration, prediction horizon, and ground reaction forces**. *Journal of Biomechanics*. [DOI]

Mohsen Alizadeh Noghani* Jingshu Peng*, Edgar Bolívar-Nieto. (2025). **Center of mass estimation during non-cyclic activities: Comparison of marker-based methods and their fusion with ground reaction forces**. *Journal of Biomechanics*. [DOI]

Mohsen Alizadeh Noghani, Ehsan Sharafian M., Ben Sidaway, Babak Hejrati. (2025). **Increasing thigh extension with haptic feedback affects leg coordination in young and older adult walkers**. *Journal of Biomechanics*. [DOI]

Mohsen Alizadeh Noghani, Edgar Bolivar-Nieto. (2024). **Prediction of Whole-Body Center of Mass using Joint Angles and Ground Reaction Forces: A Framework for Human Intent Prediction**. *2024 10th IEEE RAS/EMBS International Conference for Biomedical Robotics and Biomechatronics (BioRob)*. [DOI]

Jacob Bloom, Mohsen Alizadeh Noghani, Babak Hejrati. (2023). **A Wearable Upper Extremity Rehabilitation Device for Inducing Arm Swing in Gait Training**. *2023 International Conference on Rehabilitation Robotics (ICORR)*. [DOI]

Md. Tanzid Hossain, Mohsen Alizadeh Noghani, Ben Sidaway, Babak Hejrati. (2023). **Investigating the Efficacy of a Tactile Feedback System to Increase the Gait Speed of Older Adults**. *Human Movement Science*. [DOI]

Mohsen Alizadeh Noghani, Md. Tanzid Hossein, Babak Hejrati. (2023). **Modulation of Arm Swing Frequency and Gait Using Rhythmic Tactile Feedback**. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*. [DOI]

Mohsen Alizadeh Noghani, Mohsen Shahinpoor, Babak Hejrati. (2022). **Design and Validation of a Smartphone-based Haptic Feedback System for Gait Training**. *IEEE Robotics and Automation Letters*. [DOI]

*Co-first authors.

Mohsen Alizadeh Noghani, Drew Browning, Vincent Caccese, Elizabeth DePoy, Stephen Gilson, Ryan Beaumont, Babak Hejrati. (2021). **Design and Evaluation of the Afari: A Three-wheeled Mobility and Balance Support Device for Outdoor Exercise.** *Assistive Technology*. [DOI]

Conference abstracts & presentations

Mohsen Alizadeh Noghani, Edgar Bolivar-Nieto. (2024) **A Framework for Prediction of Center of Mass Trajectory**, *Workshop: AI-Based Estimation and Control of Wearable Robotic Systems for Enhancing Human Mobility, BioRob 2024, Heidelberg, Germany*

Mohsen Alizadeh Noghani, Edgar Bolivar-Nieto. (2024). **A Framework for Prediction of Center of Mass Trajectory.** *Dynamic Walking 2024. Pensacola, FL, U.S.* [Video abstract] [Poster]

Mohsen Alizadeh Noghani, Edgar Bolivar-Nieto. (2023). **Prediction of Human Center of Mass Position from Ground Reaction Forces.** *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). Detroit, MI, U.S.* [Abstract] [Poster]

Mohsen Alizadeh Noghani, Mohsen Shahinpoor, Babak Hejrati (2021). **Design and Validation of a Smartphone-based Haptic Feedback System for Gait Training.** *2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). Virtual.* [Video presentation]

Theses

Development of a Novel Haptic Feedback System for Gait Training Applications. (2021). *University of Maine.* [PDF]

Analysis and Optimization of a 4-UPS Parallel Robot. (2018). *Ferdowsi University of Mashhad.*

Experience

Wearable Robotics Lab, University of Notre Dame 2022-present
Research Assistant Notre Dame, U.S.

- Development of predictive control methods for robotic prosthetic legs

Department of Aerospace and Mechanical Engineering, University of Notre Dame 2022-present
Teaching Assistant Notre Dame, U.S.

- Teaching Assistant for “Design of Machine Elements”, “Intermediate Controls”, “AME Laboratory II”, “Differential Equations, Vibrations, and Control I”

Biorobotics & Biomechanics Lab, University of Maine 2019-2022
Research Assistant Orono, ME

- Developed a wireless haptic feedback system for gait training controlled by a smartphone
- Contributed to the NIH R15 grant “A Wearable Haptic Feedback System for Home-based Gait Training for Older Adults” and the NSF CAREER grant “Interlimb Neural Coupling to Enhance Gait Rehabilitation”

Department of Mechanical Engineering, University of Maine 2019-2021
Teaching Assistant Orono, ME

- Teaching Assistant for “Robot Dynamics and Control”, “Engineering Dynamics”, and “Mechanism Analysis and Design”

FUM Center for Advanced Rehabilitation and Robotics Research (FUM CARE) 2017-2019
Undergraduate Research Assistant Mashhad, Iran

- Developed a real-time EtherCAT motion control system in PREEMPT_RT Linux (worst-case jitter: 37 μ s. 99.5 percentile jitter: less than 6 μ s)
- Optimized the design of a 4-UPS parallel robot for a large workspace, small size, and low power usage using the genetic algorithm

Professional activities

Peer review

- Journal of Biomechanics; IEEE Robotics and Automation Letters; AAAI Conference on Artificial Intelligence (AAAI); IEEE Journal of Translational Engineering in Health & Medicine; BMC Sports Science, Medicine and Rehabilitation; BMC Geriatrics; Scientific Data; Journal of NeuroEngineering and Rehabilitation; Scientific Reports; IEEE Transactions on Neural Systems and Rehabilitation Engineering; BioMedical Engineering OnLine; IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob); IEEE International Conference on Robotics and Automation (ICRA)

Training

- Bootlin Real-Time Linux with PREEMPT_RT [\[Certificate\]](#)
- Bootlin Embedded Linux Kernel and Driver Development [\[Certificate\]](#)

Membership

- American Society of Biomechanics (ASB) 2024-2025

Courses

Statistics, mathematics, robotics

- Applied Probability; Applied Bayesian Statistics; Advanced Biostatistical Methods; Statistical Inference; SQL for Data Science; Applied Linear Models; Statistical Methods in Data Mining and Prediction; Deep Neural Networks; Optimization for Data Science; Applied Generalized Linear Models; Spatio-temporal Statistics for Environmental Applications; Basic Topology and Geometry; Optimization-based Robotics; Analytical Dynamics; Differential Geometry; Advanced Control Systems

Computer science and engineering

- Cluster Computing; Embedded Systems; Operating Systems; Computer Vision