

# Mohsen Alizadeh Noghani

mohsen.alizadeh.noghani@gmail.com

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## Education

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<b>Ph.D. in Mechanical Engineering</b> University of Notre Dame GPA: 3.97	2022-present Notre Dame, U.S.
<b>M.Sc. in Applied &amp; Computational Mathematics &amp; Statistics (Statistics track)</b> University of Notre Dame GPA: 4.00	2022-present Notre Dame, U.S.
<b>M.Sc. in Mechanical Engineering</b> University of Maine GPA: 4.00	2019-2021 Orono, U.S.
<b>B.Sc. in Mechanical Engineering</b> Ferdowsi University of Mashhad GPA: 17.65	2013-2018 Mashhad, Iran

## Publications

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

**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*. [\[DOI\]](#)**

## Preprints

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**Mohsen Alizadeh Noghani, Edgar Bolívar-Nieto. (2024). Predicting center of mass position in non-cyclic activities: The influence of acceleration, prediction horizon, and ground reaction forces. [\[DOI\]](#)**

Jingshu Peng\* **Mohsen Alizadeh Noghani\***, Edgar Bolívar-Nieto. (2024). **Comparative analysis of whole-body center-of-mass estimation methods in dynamic and static activities using marker-based systems.** [DOI]

## Conference Abstracts & Presentations

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**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

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**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

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

- Development of predictive control methods for robotic prosthetic legs

**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)** 2017-2018  
*Undergraduate Research Assistant* Mashhad, Iran

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

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\*Co-first authors.

## Professional Activities

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### Peer review

- 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](#)]

## Courses

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### Statistics, applied mathematics, and machine learning

- 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

### Computer Science and engineering

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