Sarmad Mehrdad

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Education

- **Ph.D.** New York University, Brooklyn, NY — June 2020 - December 2025(Expected)
  Electrical Engineering
  Ph.D. Advisor: Prof. Ludovic Righetti
- **M.Sc.** Clarkson University, Potsdam, NY — January 2017 - August 2019
  Mechanical Engineering || Thesis: Developing an Educational Package for Design, Control, and Simulation of Mobile Wheeled Robots
- **B.Sc.** K. N. Toosi University of Technology, Tehran, Iran — August 2010 - August 2015
  Mechanical Engineering || Thesis: Boundary Detection of Cancerous Tumor Embedded in Soft Tissue Using Artificial Intelligence

Research Experience

- Inverse Reinforcement Learning, approaches on physical Human-Robot Interaction
- Human Motion Learning, using cost function estimation by inverse reinforcement learning
- Probabilistic modeling and Learning from Demonstration for data-driven robotics
- Designing AI models for health deterioration prediction for patients with respiratory illnesses
- Design/Development of NYU BioTracker; Wearable device for COVID-19 prediction and tracking.
- Conducting human subject biodata collection using EMG, EEG, and HD-EMG sensors to assess fatigue, post-stroke rehabilitation progress, and pain.
- Design, simulation, and fabrication of 3D printable soft actuators to incorporate into soft exoskeletons.

Publications (In timely order)

- Sabbah, Maxime, Filip Bečanović, **Sarmad Mehrdad**, Ludovic Righetti, Bruno Watier, and Vincent Bonnet. "Minimal Observations Inverse Reinforcement Learning for Predicting Human Box-Lifting Motions." In International Conference on Humanoid Robots 2025. 2025.
- **Mehrdad, Sarmad**, Sabbah Maxime, Vincent Bonnet, and Ludovic Righetti. "Learning Human Reaching Optimality Principles from Minimal Observation Inverse Reinforcement Learning" arXiv preprint arXiv:2510.00329 (2025).
- **Mehrdad, Sarmad**, Avadesh Meduri, and Ludovic Righetti. "Cost Function Estimation Using Inverse Reinforcement Learning with Minimal Observations." arXiv preprint arXiv:2505.08619 (2025). [Accepted for 2025 IEEE/RSJ international conference on intelligent robots and systems (IROS)]
- O'Keeffe, Rory, Neha Mehta, Yair Shahar, **Sarmad Mehrdad**, Anat Lubetzky, and S. Farokh Atashzar. "Measuring Changes in Cortical Processes during VR-aided Physical Exercise-an EEG-based Approach." In 2024 46th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), pp. 1-5. IEEE, 2024.
- Yang, Jinghui, Rory O'Keeffe, Seyed Yahya Shirazi, **Sarmad Mehrdad**, S. Farokh Atashzar, and Smita Rao. "Muscle activity and hypoalgesia in blood flow restricted versus unrestricted effort-matched resistance exercise in healthy adults." Physiological Reports 12, no. 14 (2024): e16037.
- Libby, Jacqueline, Aniket A. Somwanshi, Federico Stancati, Gayatri Tyagi, **Sarmad Mehrdad**, JohnRoss Rizzo, and S. Farokh Atashzar. "How Does the Inner Geometry of Soft Actuators Modulate the Dynamic and Hysteretic Response?." arXiv preprint arXiv:2308.04722 (2023).
- **Mehrdad, Sarmad**, Farah E. Shamout, Yao Wang, and S. Farokh Atashzar. "Deep learning for deterioration prediction of COVID-19 patients based on time-series of three vital signs." Scientific Reports 13, no. 1 (2023): 9968.
- **Mehrdad, Sarmad**, and S. Farokh Atashzar. "FiMReSt: Finite Mixture of Multivariate Regulated Skew-t Kernels–A Flexible Probabilistic Model for Multi-Clustered Data with Asymmetrically-Scattered Non-Gaussian Kernels." arXiv preprint arXiv:2305.09071 (2023).
- O'Keeffe, Rory, Vaibhavi Rathod, Seyed Yahya Shirazi, **Sarmad Mehrdad**, Alexis Edwards, Smita Rao, and S.

Farokh Atashzar. "Linear versus Nonlinear Muscle Networks: A Case Study to Decode Hidden Synergistic Patterns During Dynamic Lower-limb Tasks." In 2023 11th International IEEE/EMBS Conference on Neural Engineering (NER), pp. 01-05. IEEE, 2023.

- O'Keeffe, Rory, Seyed Yahya Shirazi, **Sarmad Mehrdad**, Tyler Crosby, Aaron M. Johnson, and S. Farokh Atashzar. "Perilaryngeal-Cranial Functional Muscle Network Differentiates Vocal Tasks: A Multi-Channel sEMG Approach." IEEE Transactions on Biomedical Engineering (2022).
- A. Altelbani, H. Zhou, **S. Mehrdad**, F. Alambeigi, and S. F. Atashzar, "Design, Fabrication, and Validation of a New Family of 3D-Printable Structurally-Programmable Actuators for Soft Robotics," in IEEE Robotics and Automation Letters, doi: 10.1109/LRA.2021.3101860.
- **Mehrdad, Sarmad**, Yao Wang, and S. Farokh Atashzar. "Perspective: Wearable Internet of Medical Things for remote tracking of symptoms, prediction of health anomalies, implementation of preventative measures, and control of virus spread during the era of COVID-19." Frontiers in Robotics and AI 8 (2021): 610653.
- O'Keeffe, Rory, Seyed Yahya Shirazi, Jinghui Yang, **Sarmad Mehrdad**, Smita Rao, and S. Farokh Atashzar. "Non-parametric Functional Muscle Network as a Robust Biomarker of Fatigue." bioRxiv (2021).
- O'Keeffe, Rory, Seyed Yahya Shirazi, **Sarmad Mehrdad**, Tyler Crosby, Aaron M. Johnson, and S. Farokh Atashzar. "Characterization of cervical-cranial muscle network in correlation with vocal features." bioRxiv (2021).
- **Mehrdad, S.**, Liu, F., Pham, M.T., Lelevé, A. and Atashzar, S.F., 2021. Review of Advanced Medical Telerobots. Applied Sciences, 11(1), p.209.
- **Mehrdad, S.**, Mousavian, S., Madraki, G. and Dvorkin, Y., 2018. Cyber-Physical Resilience of Electrical Power Systems against Malicious Attacks: a Review. Current Sustainable/Renewable Energy Reports, 5(1), pp.14-22.
- Keshavarz, M., **S. Mehrdad**, and A. Mojra. "Boundary estimation of soft tissue tumor by using feed forward neural network with application of artificial tactile sensing-Boundary estimation of soft tissue tumor." In 2015 22nd Iranian Conference on Biomedical Engineering (ICBME), pp. 380-384. IEEE, 2015.

Patents

- S. Farokh Atashzar, Y. Wang, D. Sterman, S. Mehrdad. "Smart wearable IoT device for health tracking, contact tracing and prediction of health deterioration". US20240081657A1, USPTO, 2024. (Inventorship amended to include S. Mehrdad)
- S. Farokh Atashzar, Y. Wang, D. Sterman, S. Mehrdad. "Smart wearable IoT device for health tracking, contact tracing and prediction of health deterioration". WO2022241311A1, WIPO (PCT), 2022. (Inventorship amended to include S. Mehrdad)

Teaching Experience

New York University

- **ARISE (K-12)**: Applied Research Innovations in Science and Engineering — June 2024 – August 2024
- **SPARC (K-12)**: Summer Program for Automation, Robotics, and Coding — June 2023 – August 2023
- **Teaching Assistant**: Haptics and Telerobotics — August 2023 – November 2023
- **Course Assistant**: Interactive Medical Robotics — January 2023 – May 2023
- **Teaching Assistant**: Haptics and Telerobotics — August 2022 – December 2022
- **SPARC (K-12)**: Summer Program for Automation, Robotics, and Coding — June 2022 – August 2022
- **Course Assistant**: Interactive Medical Robotics — January 2022 – May 2022
- **Teaching Assistant**: Haptics and Telerobotics — August 2021 – December 2021
- **Course Assistant**: Interactive Medical Robotics — January 2021 – May 2021

Clarkson University

- **Teaching Assistant**: Electrical and Computer Engineering Labs — August 2019 – December 2019
- **Teaching Assistant**: Robotics I & II — January 2019 – December 2019
- **Teaching Assistant**: Dynamical Systems — January 2019 – May 2019
- **Instructor**: Mechanical and Aeronautical Engineering Labs — August 2018 – December 2018
- **Teaching Assistant**: Mechanical and Aeronautical Engineering Labs — August 2017 – December 2018
- **Teaching Assistant**: Aircraft Design II — January 2017 – May 2017

Honors and Awards

- **Ernst Weber Fellowship**, Tandon School of Engineering, New York University — September 2022
- **Tandon School of Engineering Fellowship**, New York University — June 2021
- **K-12 STEM Education Fellowship**, Tandon School of Engineering, New York University — June 2021
- **K-12 STEM Education Fellowship**, Tandon School of Engineering, New York University — June 2020
- **Tandon School of Engineering Fellowship**, New York University September — 2020

Technical Reviews

IEEE:

International Conference on Robotics and Automation (ICRA)	2024
Transactions on Robotics (T-RO)	2023
International Conference on Intelligent Robots and Systems (IROS)	2022
International Conference on Rehabilitation Robotics (ICORR)	2022
Robotics and Automation Letters (RA-L)	2021-2022
International Conference on Autonomous Systems (ICAS)	2021

Elsevier:

Robotics and Autonomous Systems	2021