Nima Fazeli

Assistant Professor of Robotics
Assistant Professor of Mechanical Engineering
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Professional Appointments

University of Michigan:

2022 – Present	Assistant Professor, Department of Robotics
2020 – Present	Assistant Professor, Department of Mechanical Engineering
2020 – Present	Core Faculty of Robotics

Education

2020	Postdoc, MIT (Advised by Prof. Alberto Rodriguez)
2019	PhD, MIT Mechanical Engineering (Advised by Prof. Alberto Rodriguez)
2014	MSc, UMD Mechanical Engineering (Advised by Prof. Jin-Oh Hahn)
2012	MSc, University of Alberta, Transferred to UMD to complete MSc
2011	BSc, Amirkabir University of Technology, Mechanical Engineering

Awards and Honors

Academic Awards:

2022	Agilent Early Career Professor Award Finalist
2022	Amazon Research Award – Robotics
2021	Google Faculty Research Award
2014	Rohsenow Fellowship – MIT
2013	Academic Excellence Award – UMD

Paper Awards:

2018	Best Cognitive Robotics Paper – IROS
	Awarded to "Augmenting Physical Simulators with Stochastic Neural ..."
2017	Best Systems Paper (Manipulation) Amazon Robotics Awards
	Awarded to "Robotic Pick-and-Place of Novel Objects in Clutter ..."
2017	ISRR 2017 Doctoral Consortium Grant
	Awarded to "Fundamental Limitations in Performance ..."
2016	Best Student Paper Finalist – IROS (Top 5 of 800)
	Awarded to "More Than a Million Ways to be Pushed ..."
2015	ISRR 2015 Paper Selected for Special Issue of IJRR
	Awarded to "Identifiability Analysis of Planar Rigid-Body Frictional Contact"
2012	Best Student Paper Finalist – 5th ASME DSCC (Top 5 of 52 nominated)
	Awarded to "Active Non-Intrusive System Identification for Cardiovascular ..."

Competitions and Travel Awards:

2017	Sontheimer Travel Award – MIT Mechanical Engineering
2017	1st Place – Amazon Robotics Challenge Stowing Task
2016	3rd and 4th Place – Amazon Picking Challenge
2015	2nd Place – Amazon Picking Challenge
2014	Rohsenow Fellowship – MIT
2012	Dynamic Systems and Controls Conference (DSCC) Travel Grant Award

Leadership and Service Activities

University of Michigan:

2022 – Present	Robotics Department Seminar Committee Co-Chair
2020 – Present	Robotics Department Graduate Committee
2020 – Present	Mechanical Engineering Seminar Series Committee
2021 – 2022	Robotics Diversity, Equity, and Inclusivity (DEI) Committee Co-Chair

Robotics Community:

2022	Associate Editor ICRA
2022 – Present	Orbital Reef Advisory Council
2020	RSS Workshop Organizer - "Good Citizens of Robotics"
2020	Program Committee - Conference on Robot Learning (CoRL)
2020	Associate Editor IROS
2016 & 2017	Organizing Committee of Robocon at MIT
2015	Assistant Organizer of the NSF National Robotics Initiative PI Meeting
2013	Co-chair of Sys. ID. and Therapeutic Control in Bio-Systems Session DSCC

Outreach:

2021	UM - LSAMP Robotics Summer Camp
2021	Moorehouse College Mentorship
2015 – 2016	President of the Persian Student Association at MIT
2015 – 2016	Orientation Chair for Graduate Association of Mechanical Engineers at MIT

Review Service Awards:

2016	Elsevier Recognition Certificate: Computers in Biology and Medicine
2015	Elsevier Recognition Certificate: Biomedical Signal Processing and Control

Courses Teaching

University of Michigan – Lead Instructor:

2021/2022	MECHENG 360 - Modeling, Analysis, and Control of Dynamical Systems
2020/2021	MECHENG 599 - Introduction to Robotic Manipulation

Publications

Refereed Journal Articles:

J1 S. Zhong, N. Fazeli, and D. Berenson, "Soft tracking using contacts for cluttered objects to perform blind object retrieval," *IEEE Robotics and Automation Letters*, 2022

J2 S. Zhong, Z. Zhang, N. Fazeli, and D. Berenson, "Tampc: A controller for escaping traps in novel environments," *IEEE Robotics and Automation Letters*, 2021

J3 N. Fazeli, M. Oller, J. Wu, Z. Wu, J. B. Tenenbaum, and A. Rodriguez, "See, feel, act: Hierarchical learning for complex manipulation skills with multisensory fusion," *Science Robotics*, vol. 4, no. 26, 2019

J4 A. Zeng *et al.*, "Robotic Pick-and-Place of Novel Objects in Clutter with Multi-Affordance Grasping and Cross-Domain Image Matching," *International Journal of Robotic Research (IJRR)*, 2018

J5 N. Fazeli, R. Kolbert, R. Tedrake, and A. Rodriguez, "Parameter and Contact Force Estimation of Planar Rigid-bodies Undergoing Frictional Contact," *The International Journal of Robotics Research (IJRR)*, vol. 36, no. 13-14, pp. 1437–1454, 2017

J6 C.-S. Kim, N. Fazeli, M. S. McMurtry, B. A. Finegan, and J.-O. Hahn, "Quantification of Wave Reflection using Peripheral Blood Pressure Waveforms," *IEEE Journal of Biomedical and Health Informatics*, vol. 19, no. 1, pp. 309–316, 2015

J7 C.-S. Kim, N. Fazeli, and J.-O. H. Hahn, "Data-Driven Modeling of Pharmacological Systems using Endpoint Information Fusion," *Computers in Biology and Medicine*, vol. 61, pp. 36 – 47, 2015

J8 M. Abdollahzade, C.-S. Kim, N. Fazeli, B. A. Finegan, M. S. McMurtry, and J.-O. Hahn, "Data-driven Lossy Tube-load Modeling of Arterial Tree: In-human Study," *Journal of Biomechanical Engineering*, vol. 136, no. 10, p. 101011, 2014

J9 N. Fazeli, C.-S. Kim, M. Rashedi, A. Chappell, S. Wang, R. MacArthur, M. S. McMurtry, B. Finegan, and J.-O. Hahn, "Subject-specific Estimation of Central Aortic Blood Pressure

via System Identification: Preliminary In-human Experimental Study," *Medical & Biological Engineering & Computing*, vol. 52, no. 10, pp. 895–904, 2014

J10 M. Rashedi, N. Fazeli, A. Chappell, S. Wang, R. MacArthur, M. S. McMurtry, B. A. Finegan, and J.-O. Hahn, "Comparative Study on Tube-load Modeling of Arterial Hemodynamics in Humans," *Journal of Biomechanical Engineering*, vol. 135, no. 3, p. 031005, 2013

J11 N. Fazeli and J.-O. Hahn, "Estimation of Cardiac Output and Peripheral Resistance using Square-wave Approximated Aortic Flow Signal," *Frontiers in Physiology*, vol. 3, p. 298, 2012

Conference Proceedings:

C1 Y. Wi, A. Zeng, P. Florence, and N. Fazeli, "Virdo++: Real-world, visuo-tactile dynamics and perception of deformable objects," *Conference on Robot Learning (CoRL)*, 2022

C2 M. Oller, D. Berenson, and N. Fazeli, "Manipulation via membranes: High-resolution and highly deformable tactile sensing and control," *Conference on Robot Learning (CoRL)*, 2022

C3 M. van der Merwe, D. Berenson, and N. Fazeli, "Learning the dynamics of compliant tool-environment interaction for visuo-tactile contact servoing," *Conference on Robot Learning (CoRL)*, 2022

C4 Y. Chen, M. van der Merwe, A. Sipos, and N. Fazeli, "Visuo-tactile transformers for robotic manipulation," *Conference on Robot Learning (CoRL)*, 2022

C5 A. Sipos and N. Fazeli, "Simultaneous contact location and object pose estimation using proprioceptive tactile feedback," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022

C6 Y. Wi, P. Florence, A. Zeng, and N. Fazeli, "Virdo: Visio-tactile implicit representations of deformable objects," *IEEE International Conference on Robotics and Automation (ICRA)*, 2022

C7 S. Zhong, N. Fazeli, and D. Berenson, "Soft tracking using contacts for cluttered objects to perform blind object retrieval," *IEEE International Conference on Robotics and Automation (ICRA)*, 2022

C8 S. Zhong, Z. Zhang, N. Fazeli, and D. Berenson, "Tampc: A controller for escaping traps in novel environments," *IEEE International Conference on Robotics and Automation (ICRA)*, 2021

C9 A. Ajay, M. Bauza, J. Wu, N. Fazeli, J. B. Tenenbaum, A. Rodriguez, and L. P. Kaelbling, "Combining Physical Simulators and Object-Based Networks for Control," *IEEE International Conference on Robotics and Automation (ICRA)*, 2019

C10 A. Ajay, J. Wu, N. Fazeli, M. Bauza, L. P. Kaelbling, J. B. Tenenbaum, and A. Rodriguez, "Augmenting Physical Simulators with Stochastic Neural Networks: Case Study of Planar Pushing and Bouncing," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2018, **Best Cognitive Robotics Paper**

C11 A. Zeng *et al.*, "Robotic Pick-and-Place of Novel Objects in Clutter with Multi-affordance Grasping and Cross-domain Image Matching," *IEEE International Conference on Robotics and Automation (ICRA)*, pp. 1–8, 2018, **Best Systems Paper – Amazon Manipulation Awards**

C12 N. Fazeli, S. Zapolsky, E. Drumwright, and A. Rodriguez, "Learning Data-efficient Rigid-body Contact Models: Case Study of Planar Impact," *1st Annual Conference on Robotic Learning (CoRL)*, vol. 78, 2017

C13 N. Fazeli, S. Zapolsky, E. Drumwright, and A. Rodriguez, "Fundamental Limitations in Performance and Interpretability of Common Planar Rigid-Body Contact Models," *International Symposium of Robotic Research (ISRR)*, 2017

C14 N. Fazeli, E. Donlon, E. Drumwright, and A. Rodriguez, "Empirical Evaluation of Common Contact Models for Planar Impact," in *IEEE International Conference on Robotics and Automation (ICRA))*, pp. 3418–3425, 2017

C15 K.-T. Yu, M. Bauza, N. Fazeli, and A. Rodriguez, "More than a Million Ways to be Pushed. A High-Fidelity Experimental Data Set of Planar Pushing," in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2016, **Best Paper Finalist**

C16 K.-T. Yu, N. Fazeli, N. Chavan-Dafle, O. Taylor, E. Donlon, G. D. Lankenau, and A. Rodriguez, "A Summary of Team MIT's Approach to the Amazon Picking Challenge 2015," *arXiv preprint arXiv:1604.03639*, 2016

C17 N. Fazeli, R. Tedrake, and A. Rodriguez, "Identifiability Analysis of Planar Rigid-body Frictional Contact," in *Robotics Research/International Symposium of Robotic Research 2015*, pp. 665–682, Springer, 2015, **Selected for Special Issue of IJRR**

C18 C.-S. Kim, N. Fazeli, M. S. McMurtry, B. A. Finegan, and J.-O. Hahn, "Quantification of Wave Reflection using Peripheral Blood Pressure Waveforms," *IEEE Journal of Biomedical and Health Informatics*, vol. 19, no. 1, pp. 309–316, 2015

C19 M. Abdollahzade, C.-S. Kim, N. Fazeli, J.-O. Hahn, M. S. McMurtry, and B. Finegan, "Lossy Transmission Line Modeling of of Arterial Tree in Time Domain," in *36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 2014

C20 M. Rashedi, N. Fazeli, A. Chappell, S. Wang, R. MacArthur, M. S. McMurtry, B. Finegan, and J.-O. Hahn, "Modeling and System Identification of Arterial Hemodynamics in Humans," in *ASME Dynamic Systems and Control Conference (DSCC)*, 2013

C21 N. Fazeli and J.-O. Hahn, "Active Non-Intrusive System Identification for Cardiovascular Monitoring: Part II Development of System Identification Algorithm," in *ASME Dynamic Systems and Control Conference (DSCC)*, 2013

C22 N. Fazeli, C.-S. Kim, and J.-O. Hahn, "Non-invasive Estimation of Central Blood Pressure Waveform using a Dual Diametric Cuff System: a Preliminary Study," in *ASME Conference on Frontiers in Medical Devices: Applications of Computer Modeling and Simulation*, 2013

C23 N. Fazeli, C. S. Kim, and J.-O. Hahn, "Quantification of Wave Reflection in the Arterial Tree via Diametric Blood Pressure Waveform Measurement," in *American Control Conference (ACC), 2013*, 2013

C24 N. Fazeli, M. Rashedi, A. Chappell, S. Wang, R. MacArthur, M. S. McMurtry, B. Finegan, and J.-O. Hahn, "Subject-specific Estimation of Aortic Blood Pressure via System Identification: Preliminary in-human Experimental Study," in *American Control Conference (ACC), 2013*, pp. 740–745, IEEE, 2013

C25 N. Fazeli, H.-C. Kim, and J.-O. Hahn, "Active Non-Intrusive System Identification for Cardiovascular Monitoring: Part I—Excitation and Measurement Protocol Design," in *ASME Dynamic Systems and Control Conference (DSCC)*, pp. 543–551, 2012, **Best Paper Finalist**

Invited Talks:

T1 N. Fazeli, "Tactile dexterity and deformable object manipulation for osam," *AFRL/AgMan UNM*, 2022

T2 N. Fazeli, "Visio-tactile object representations for forceful tool use," *Sony AI*, 2021

T3 N. Fazeli, "Learning implicit representations for perception and manipulation of deformable objects," *Google Robotics*, 2020

T4 N. Fazeli, "Visio-tactile object representations for forceful tool use," *Samsung AI*, 2020

T5 N. Fazeli, "Towards robotic manipulation - understanding the world through contact," *University of Pennsylvania, Electrical and Systems Engineering Department*, 2019

T6 N. Fazeli, "Towards robotic manipulation - understanding the world through contact," *University of Michigan, Ann Arbor, Robotics Insitute and Mechanical Engineering*, 2019

T7 N. Fazeli, "Towards robotic manipulation - understanding the world through contact," *University of Southern California, Aerospace and Mechanical Engineering Department*, 2019

T8 N. Fazeli, "Combining physical simulators and object-based networks for prediction and control," *Neural Information Processing Systems (NIPS)– Workshop on Modeling the Physical World: Learning, Perception, and Control*, 2018

T9 N. Fazeli, "See, Feel, Act: Learning Complex Manipulation Skills using Causal Structure and Multi-Sensory Fusion," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)– Workshop on Examining Sensing Modalities for Robust and Dexterous Object Manipulation*, 2018

T10 N. Fazeli, "Towards High Fidelity Stochastic Simulators with Data-Augmented Models," *Robotic Sciences and Systems – Workshop on Learning and Inference in Robotics: Integrating Structure, Priors and Models*, 2018

T11 N. Fazeli, "Empirical Evaluation of Common Contact Models for Planar Impact," *New England Manipulation Symposium (NEMS)*, 2017

T12 N. Fazeli, "Identifiability Analysis of Planar Rigid-Body Frictional Contact," *New England Manipulation Symposium (NEMS)*, 2015

Theses:

1. N. Fazeli, "Inference and Learning for Rigid-Body Models of Manipulation," *Doctoral thesis submitted to the Department of Mechanical Engineering – Massachusetts Institute of Technology*, 2019

2. N. Fazeli, "An Active Non-Intrusive System Identification Approach for Cardiovascular Health Monitoring," *Masters thesis submitted to the Department of Mechanical Engineering – University of Maryland at College Park*, 2014

3. N. Fazeli, "Active Vibration Attenuation of Vehicle Engine to Chassis using Adaptive FX-LMS Algorithms," *Bachelors thesis submitted to the Department of Mechanical Engineering – Amirkabir University of Technology*, 2011

Media Coverage

2022	Chess Playing Robot Breaks Child's Finger in Russian Chess Tournament
	Appeared on CNN and CNN New Day Podcast to comment on the topic.
2018	See, Feel, Act: Hierarchical Learning for Complex Manipulation Skills with Multisensory Fusion
	Covered in BBC, CNN, CBS, Tech Crunch, The Tech Review, The Times, Washington Post, Wired ...
2015 – 2017	Amazon Picking Challenge
	Covered in MIT Technology Review, MIT News, BetaBoston, EPR Retail ...
2016	Fundamental Limitations of Rigid-body Contact Models
	Feature on MIT's Mechanical Engineering Website and Twitter.