Iman Nodozi

Graduate Research Assistant
University of California, Santa Cruz (UCSC),
Department of Electrical and Computer Engineering

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Research Interests

Broad area

Machine learning, artificial intelligence, control, dynamical systems, optimization, and hybrid systems

Theory focus

-Data distribution
-Learning theory
-Wasserstein Barycenter
-Density control
-Statistics
-Stochastic uncertainty propagation and nonlinear estimation
-Convex and non-convex optimization
-Bayesian inference
-MPC
-PINN
-Data Analysis

Profesional Software and Skills

Programing Language

Python, Matlab, HTML, Programmable logic controller (PLC), C++

Framework

TensorFlow, PyTorch, Keras, DeepXDE, PYMC3, Panda

Education

Ph.D.

ECE, University of California, Santa Cruz (UCSC), California, USA. (2019-March 2024)

Master of Science (M.Sc.)

ECE, University of California, Santa Cruz (UCSC), California, USA. (2019-2021)
Master of Science, Electrical Engineering

Master of Science (M.Sc.)

Imam Khomeini International University (IKIU), Qazvin, Iran.(2013-2016)
Master of Science, Electrical Engineering, Control

Bachelor of Science (B.Sc.)

Hamedan University of Technology, Hamedan, Iran. (2008-2013)
Bachelor of Science, Electrical Engineering, Control

Dissertation

Ph.D. Project: "Measure-valued Proximal Recursions for Learning and Control."

M.Sc. Thesis: "Nonlinear Hybrid Systems Control via Linear Matrix Inequalities."

Academic Experience

Guest Instructor for Nonlinear Control Theory, Spring 2022, UCSC.
Teaching Assistant for Signals and Systems, Spring 2021, UCSC.
Teaching Assistant for Analog Electronics, Winter 2020, UCSC.
Teaching Assistant for Robot Automation, Fall 2020, UCSC.
Teaching Assistant for Linear Control Course, Fall 2014, IKIU.

Award

- Baskin School of Engineering Dissertation Year Fellowship 2023-2024
- Regents Fellowships, University of California, Santa Cruz, 2019-2020.

Reviewer Service

Conference

The 36th Conference on Neural Information Processing Systems (NeurIPS), 2022
American Control Conference (ACC), 2022, 2023
IEEE Conference on Decision and Control (CDC), 2022
International Conference on Machine Learning (ICML), 2022
Mathematical Theory of Networks and Systems (MTNS), 2022

Journal

Nonlinear Analysis: Hybrid Systems
Systems and Control Letters
Automatica

Publication

Iman Nodozi, and Abhishek Halder. "Wasserstein Consensus ADMM." Online paper: here.

Iman Nodozi, Charlie Yan, Mira Khare, Abhishek Halder, and Ali Mesbah. "Neural Schrödinger Bridge with Sinkhorn Losses: Application to Data-driven Minimum Effort Control of Colloidal Self-assembly." Online paper: here.

Iman Nodozi, Abhishek Halder, and Ion Matei. "A Controlled Mean Field Model for Chiplet Population Dynamics." IEEE Control Systems Letters, also in 62nd IEEE Conference on Decision and Control (CDC), Singapore, 2023. Online paper: here.

Charlie Yan, **Iman Nodozi**, and Abhishek Halder. "Optimal Mass Transport over the Euler Equation." 62nd IEEE Conference on Decision and Control (CDC), Singapore, 2023. Online paper: here.

- Invited paper in Session 'Optimal Transport'

Iman Nodozi, Jared O'Leary, Abhishek Halder, and Ali Mesbah. " A Physics-informed Deep Learning Approach for Minimum Effort Stochastic Control of Colloidal Self-Assembly." 2023 American Control Conference (ACC), San Diego, California, USA. Online paper: here.
Invited paper in Session 'Learning and Stochastic Optimal Control'

Alexis Teter, **Iman Nodozi**,, and Abhishek Halder. " Proximal Mean Field Learning in Shallow Neural Networks ." Online paper: here.

Iman Nodozi, and Ricardo Sanfelice. "A Mixed Integer Approach for the Solution of Hybrid Model Predictive Control Problems." 61st IEEE Conference on Decision and Control, Cancún, Mexico, 2022. Online paper: here.

Iman Nodozi, and Abhishek Halder. "Schrödinger Meets Kuramoto via Feynman-Kac: Minimum Effort Distribution Steering for Noisy Nonuniform Kuramoto Oscillators." 61st IEEE Conference on Decision and Control, Cancún, Mexico, 2022. Online paper: here.

Iman Nodozi, and Abhishek Halder. "A Distributed Algorithm for Measure-valued Optimization with Additive Objective." 25th International Symposium on Mathematical Theory of Networks and Systems (MTNS 2022), Beyreuth, Germany, 2022. Online paper: here.
Invited paper in Session 'Optimal transport: Theory and applications in networks and systems'

Iman Nodozi, and Mehdi Rahmani. "LMI-based mixed-integer model predictive control for Hybrid systems." International Journal of Control (2020): 2336-2345. Online paper: here.

Iman Nodozi, and Mehdi Rahmani. "LMI-based model predictive control for switched nonlinear systems"."Journal of Process Control" 59 (2017) 49-58. Online paper: here.

Mehdi Rahmani, and **Iman Nodozi**. "Phase-locked loops redesign by the Lyapunov theory." Electronics Letters 51.21 (2015): 1664-1666. Online paper: here.

Industrial Experience

Application Engineer intern at Onsemi: (September 2022-January 2023)

Electrical Engineer at SOKHT AMA co: (2016-2018)

Aluminum Die Cast machine:
Project manager and engineer for reconstruction and automation of Die Cast machine: 400, 250, and 160 tons.

Auxiliary equipment of Aluminum Die Cast machine:
Project manager and engineer for reconstruction and automation of Die Cast lube spraying system for Agrati 1200 tons, Idra 1100 and 320 tons, and Ardi 420 tons Die Cast. You can find a video of these spraying systems that added to Agrati 1200 tons Die Cast here. (SOKHT AMA.co 2016 and 2017)

Project manager and engineer for reconstruction and automation of Die Cast ladle systems for Buhler 400 tons, Idra 1100, 320 tons Die Cast. You can find a video of these Ladle systems that added to Buhler 400 tons Die Cast here. (SOKHT AMA.co 2016 and 2017)

Industrial Test Machine:
Project manager and engineer for designing, constructing of performance test machine for oil pump of tu5 engine Peugeot cars manufactured by Iran Khodro.co. (SOKHT AMA.co 2017) You can find the video of this testing machine here.

Industrial course:
Academy of DQS excellence Certification of training Course for Requirements of ISO/TS 16949:2009 and IATF 16949:2016 (International Automotive Task Force) courses in winter and fall 2017, respectively, Certificate here.

References

Abhishek Halder
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Iowa State University
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Ali Mesbah
Associate Professor of Chemical and Biomolecular Engineering,
University of California, Berkeley
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Ricardo Sanfelice
Professor of Department of Electrical and, Computer Engineering,
University of California, Santa Cruz
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Mehdi Rahmani
Associate Professor of Department of Electrical Engineering,
Imam-Khomeini International University
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