Iman Nodozi

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Professional Summary

PhD in Electrical and Computer Engineering with expertise in stochastic control, convex optimization, and data-driven modeling. Experienced in applying measure-valued optimization techniques to online bidding and budget pacing in first-price auctions. Strong background in numerical simulation, Wasserstein-based algorithms, and computational modeling. Proficient in Python and MATLAB, with industry experience in semiconductor systems and automated test development. Actively seeking opportunities to apply advanced optimization and control methods to real-world problems in online advertising and decision systems.

Technical Skills

- **Machine Learning and Data Analysis**: Large Language Models (LLMs), Multimodal Architectures, Wasserstein Barycenter, Wasserstein GANs, Statistical Modeling.
- **Deep Learning Frameworks**: PyTorch, TensorFlow, DeepXDE.
- **Programming Languages**: Python, MATLAB, SQL, LabVIEW, TestStand.
- **Control and Optimization**: Linear/Nonlinear Control, PID, LQR, MPC, Adaptive Control, GNC.
- **Estimation and Filtering**: Kalman Filter, Bayesian Filtering.
- **Libraries and Tools**: NumPy, Pandas, MySQL, PyMC3, SciPy.

Experience

Senior Applications Engineer Feb '24 – Now
Onsemi *San Jose, CA*

• Develop and implement automated test systems for data collection and analysis of AC and DC datasheet parameters for power management devices. Successfully replaced third-party software, significantly enhancing testing efficiency. Achieved a 100% reduction in test data analysis time.

Graduate Student Researcher (PhD) Sep '19 – Jun '24
UC Santa Cruz *Santa Cruz, California*

• Proximal Algorithms for Stochastic Learning.

  • Developed a novel distributed Wasserstein ADMM algorithm for measure-valued optimization, with applications in generative AI and data distribution tasks.

• Stochastic Control and Optimization

  • Developed an AI optimization framework using physics-informed neural networks (PINN) for efficient and precise material engineering processes. Joint work between UCSC and UC Berkeley

  2024 American Automatic Control Council's Best Application Paper Award

• Guidance, Navigation, and Control (GNC) Systems.

  • Applied Optimal Mass Transpose framework to optimize satellite trajectory planning, enhancing the precision and robustness of GNC systems under uncertainty.

• Controlled Mean Field Models

  • Developed a controlled mean-field model for precise manipulation of chiplet populations in dielectric liquids using electric fields, demonstrating predictable and effective control. Joint work between UCSC and Palo Alto Research Center (PARC), now part of SRI International.

Education

University of California, Santa Cruz Santa Cruz, CA
Ph.D. in Electrical and Computer Engineering *Sep 2019 – Jun 2024*

• **Ph.D. Dissertation**: "Measure-valued Proximal Recursions for Learning and Control."

Awards

- 2024 American Automatic Control Council's O. Hugo Schuck Best Paper Award
- Graduate Dean's Travel Grant, UCSC, July 2024
- Dissertation Year Fellowship, Baskin School of Engineering 2023-2024
- Regents Fellowships, University of California, Santa Cruz, 2019-2020.

Selected Publications

Alexis Teter, **Iman Nodozi**, and Abhishek Halder. "Solution of the Probabilistic Lambert's Problem: Optimal Transport Approach." Online paper: here.

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

Alexis Teter, **Iman Nodozi**, and Abhishek Halder. "Solution of the Probabilistic Lambert Problem: Connections with Optimal Mass Transport, Schrödinger Bridge, and Reaction-Diffusion PDEs." Online paper: here.

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." IEEE Transactions on Control Systems Technology. 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'

2024 American Automatic Control Council's O. Hugo Schuck Best Paper Award

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.