Alisina Bayati — Curriculum Vitae

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alisina75 • alisina-bayati

Personal Data

Status: US Lawful Permanent Resident (Greencard Holder)

Gender: Male

Education

University of Illinois at Urbana-Champaign

PhD in Mechanical Science and Engineering — *2020–2026 (Expected)*

Master of Science in Mathematics — *2021–2025 (Expected)*

- GPA: 3.88/4.00
- Supervisor: Srinivasa Salapaka

Sharif University of Technology

Bachelor of Science in Mechanical Engineering — *2015–2019*

- GPA: 18.10/20.0 (3.89/4.00)
- Supervisor: Hamed Moradi

Coursework

Computer Science: Machine Learning, Dynamic Programming and Reinforcement Learning, Computer Vision

Controls: Control Systems Theory and Design, Analysis of Nonlinear Systems, Optimum Control Systems, Automatic Control, Automatic Controller Design

Mathematics: Mathematical Methods (Complex Analysis, Linear Algebra, ODEs), Random Processes, Statistics and Probability II, Real Analysis, Functional Analysis

Research Interests

Dynamical Systems Modeling and Control, Sequential Decision Making and Reinforcement Learning, Optimization

Honors and Awards

2020: University of Illinois at Urbana Champaign MechSE departmental first year fellowship

2015: Ranked within top 0.2% in Iranian national university entrance exam among 181,600 participants

Publications

- **Alisina Bayati**, Amber Srivastava, Vedant Mundada, Srinivasa Salapaka, Hao Feng, and Amir Malvandi. "Towards Sustainability in Drying by Multi-frequency Multimode Modulated Ultrasound Technology and Multi-objective Mixed-integer Dynamic Optimization." (To be Submitted)
- Amber Srivastava, **Alisina Bayati** (equal contribution), and Srinivasa Salapaka. "Sparse Linear Regression with Constraints: A Flexible Entropy-based Framework." (Accepted in European Control Conference (ECC) 2024). Available at: `https://arxiv.org/pdf/2311.08342.pdf`.

- **Alisina Bayati**, Amber Srivastava, Amir Malvandi, Hao Feng, and Srinivasa Salapaka. "Towards Efficient Modularity in Industrial Drying: A Combinatorial Optimization Viewpoint." IEEE American Control Conference (ACC) 2023. Available at: `https://ieeexplore.ieee.org/abstract/document/10156630`.

Research Projects

Center for Networked Intelligent Components and Environments (C-NICE) **UIUC**
Digital Twin for Connector Design, *Feb 2024–Present*
Developing a rapid, physics-informed, learning-based digital twin to replace slower Finite Element Method (FEM)-based simulation environments for connector design. This project aims to enhance the design and testing process of connectors, making it more efficient and less time-consuming.

Center for Networked Intelligent Components and Environments (C-NICE) **UIUC**
Self-Organizing Wireless Networks, *Sep 2021–Jan 2024*
Focused on the design and implementation of a deep learning based digital twin to replace with simulation environment and predict WiFi network performance metrics accurately.
Developed a novel combinatorial optimization algorithm for the optimal placement of routers and assignment of users to improve the overall network performance and user experience.

US Department of Energy (DOE) **UIUC**
Mixed-integer Multi-stage Optimization of Ultrasonic/Convective Food Drying Processes, *Oct 2020–Present*
Engaged in the design and development of a mixed-integer optimization algorithm to identify energy-efficient control trajectories with piecewise linear profiles for food drying processes. This involved designing and implementing control systems for the thermal system and AC motor of the drying equipment, aiming to significantly reduce energy consumption and improve sustainability in food processing.

Undergraduate Thesis **Sharif University of Technology**
Optimal PID Controller Design for Chemotherapy Drug Dosage, *Apr 2014– July 2015*
This project involves designing an optimal Proportional-Integral-Derivative (PID) controller to determine the optimal drug dosage in chemotherapy treatments. The goal is to reduce tumor size efficiently while maintaining drug concentration in the blood below toxic levels and minimizing side effects, according to specific criteria we defined.

Experiences

Reviewer
American Control Conference (ACC), European Control Conference (ECC)

Graduate Teaching Assistant **UIUC**
Dynamics of Mechanical Systems Course (ME340)

Graduate Research Assistant **UIUC**
Systems Engineering Lab for Nano Investigation and Control (SENSIC)

Undergraduate Research Assistant **Sharif University of Technology**
Control Systems Lab

Undergraduate Teaching Assistant **Sharif University of Technology**
Composite Materials Course

Skills

Programming: Python, MATLAB, LaTeX, C

Frameworks: NumPy, Pytorch, SciPy, Simulink, LabView, OpenCV, Pillow, Solidworks

Languages: Persian (Native), English (Fluent), Arabic (Elementary)