

Alisina Bayati

Curriculum Vitae

Education

- 2020–2026 **PhD in Mechanical Science and Engineering**, *University of Illinois at Urbana-Champaign*
(Expected) ○ GPA: 3.89/4.00
○ Supervisor: Dr. Srinivasa Salapaka
○ Relevant Courses: Statistical Reinforcement Learning, Machine Learning, Dynamic Programming, Computer Vision, Control Systems Theory and Design, Optimization, Optimum Control Systems
- 2021–2025 **Master of Science in Mathematics**, *University of Illinois at Urbana-Champaign*
(Expected) ○ GPA: 3.89/4.00
○ Relevant Courses: Analysis of Nonlinear Systems, Random Processes, Statistics and Probability II, Real Analysis, Functional Analysis, Optimization by Vector Space Methods
- 2015–2019 **Bachelor of Science in Mechanical Engineering**, *Sharif University of Technology*
○ GPA: 18.10/20.0 (3.89/4.00)
○ Supervisor: Dr. Hamed Moradi

Research Interests

Dynamical Systems and Control, Optimization, Sequential Decision Making, Safety-Aware Multi-Agent Systems

Publications

- **Alisina Bayati**, Amber Srivastava, Srinivasa Salapaka. "Sparse Linear Regression with Evolving Data: Control-Based Solution Tracking Approach" (Under preparation).
- **Alisina Bayati**, Amber Srivastava, Srinivasa Salapaka. "Dynamic Resource Allocation in Multi-Agent Systems under Safety and Mobility Constraints" (Under preparation).
- **Alisina Bayati**, Amber Srivastava, Vedant Mundada, et al. "Towards Sustainability in Drying by Multi-frequency Multimode Modulated Ultrasound Technology and Multi-objective Mixed-integer Dynamic Optimization." (To be submitted to Applied Energy).
- Amber Srivastava (equal contribution), **Alisina Bayati (equal contribution)**, Srinivasa Salapaka. "Sparse Linear Regression with Constraints: A Flexible Entropy-based Framework." IEEE ECC 2024. <https://ieeexplore.ieee.org/abstract/document/10591241>.
- **Alisina Bayati**, Amber Srivastava, Amir Malvandi, et al. "Towards Efficient Modularity in Industrial Drying: A Combinatorial Optimization Viewpoint." IEEE ACC 2023. <https://ieeexplore.ieee.org/abstract/document/10156630>.

Research Projects

- 2023–
Present **Safety-Aware Dynamic Resource Allocation for Mobile Agents**, *UIUC Mechanical Engineering Department*
Developed a novel optimization framework for dynamic resource allocation among mobile agents constrained by mobility, ensuring safety and collision avoidance on lower-dimensional manifolds. This project integrates safety-aware control strategies with mobility constraints in dynamic environments.

- 2021–2024 **Self-Organizing Wireless Networks, C-NICE, UIUC**
Designed and implemented a digital twin using deep learning to predict WiFi network performance metrics in real time. Developed a combinatorial optimization algorithm to optimize router placement and user assignments, improving overall network performance and scalability.
- 2020–2024 **Mixed-integer Multi-stage Optimization of Ultrasonic/Convective Drying Processes, US DOE, UIUC**
Created a mixed-integer optimization algorithm for energy-efficient control trajectories in food drying processes, significantly reducing energy consumption while enhancing sustainability. This work focuses on real-world applications of optimization in industrial drying systems.
- 2022–
Present **Control-Based Solution Tracking in Sparse Linear Regression with Evolving Data, UIUC Mechanical Engineering Department**
Addressed sparse linear regression problems where data evolves according to known dynamics by developing a control design approach that tracks the solution trajectory. This method improves computational efficiency by avoiding repetitive problem-solving at each time instance and ensuring solution accuracy in dynamic environments.

Honors and Awards

- 2024 Rated as an "Excellent Teaching Assistant" by students in TAM 211.
- 2023 Awarded a Travel Grant by the American Control Conference (ACC).
- 2020 Recipient of the MechSE Departmental First-Year Fellowship at UIUC.
- 2015 Ranked in the top 0.2% among approximately 181,000 participants in the Iranian National University Entrance Exam.

Experience

- 2024 **Reviewer**, *American Control Conference (ACC) and European Control Conference (ECC)*
- 2023–
Present **Graduate Teaching Assistant**, *University of Illinois at Urbana-Champaign (UIUC)*
Teaching Assistant for ME340: Dynamics of Mechanical Systems and TAM 210/211: Statics.
- 2022–
Present **Graduate Research Assistant**, *SENSIC Lab, University of Illinois at Urbana-Champaign*
Conducted research in control and optimization, applying quantitative analysis to enhance network performance, resource allocation, and energy sustainability.
- 2018–2019 **Undergraduate Research Assistant**, *Control Systems Lab, Sharif University of Technology*
Designed an optimal PID controller to mitigate side effects of chemotherapeutic drug dosage during cancer treatment while effectively reducing tumor size. Applied quantitative methods in healthcare optimization and communicated results across technical and healthcare-focused audiences.

Skills

- Programming Python, MATLAB, \LaTeX , C
- Frameworks NumPy, PyTorch, SciPy, CVXPY, Simulink, LabView, OpenCV, Pillow, SolidWorks
- Languages Persian (Native), English (Fluent), Arabic (Elementary)