ALISINA BAYATI

abayati2@illinois.edu | Alisina Bayati | (949) 522 0972

Personal Information

Date of Birth: 09/30/1996
Work Authorization: US permanent resident (Greencard holder)

Education

University of Illinois at Urbana-Champaign Urbana, IL
MSc in Mechanical Science and engineering *Aug. 2020 – May 2023 (Expected)*

- *GPA*: 3.92/4.00
- *Supervisor*: Srinivasa Salapaka
- Relevant courses: Mathematical Methods (Complex Analysis, Linear Algebra, ODEs), Control Systems Theory and Design, Optimization, Machine Learning, Random Processes, Real Variables, Statistics and Probability II, Analysis of Nonlinear Systems, Dynamic Programming and Reinforcement Learning, MDPs and Reinforcement Learning[1], Computer Vision[1]

Sharif University of Technology Tehran, Iran
Bachelor of science in Mechanical engineering *Aug. 2015 – Aug 2019*

- GPA: 18.10/20.0 (3.89/4.00)
- Supervisor: Hamed Moradi
- Relevant courses: Automatic Control, Automatic Controller Design, Dynamics, Dynamics of Machinery, Vibrations, Differential Equations, Engineering Mathematics (PDEs, Complex Analysis), Fundamentals of Electrical Engineering I & II

Research Interests

- Sequential decision making and reinforcement learning
- Dynamical systems and Control
- Optimization
- Robotics

Preprints

- **Alisina Bayati**[2],Amir Malvandi[2], Vedant Mundada, Amber Srivastava, Srinivasa Salapaka, and Hao Feng.
  Sustainable improvement of agri-food drying systems using ultrasound and multi-objective sequential decision making. (Under Preparation)
- **Alisina Bayati**, Amber Srivastava, Amir Malvandi, Hao Feng, and Srinivasa Salapaka.
  Towards Efficient Modularity in Industrial Drying: A Combinatorial Optimization Viewpoint .
  *(Submitted to **ACC 2023**)* arXiv preprint: arXiv:2210.01971 (2022)

[1] Current semester
[2] Equal contribution

Research Projects

Center for Networked Intelligent Components and Environments (C-NICE) Sep 2021 –
Self organizing wireless networks

- Training a deep neural network on a data set generated by WLAN toolbox in Simulink to predict the latency at receiver nodes and packet losses at transmitter nodes in a WIFI network.
- Developing an algorithm to simultaneously determine optimal routers' location and optimal communication channels for a network of heterogeneous WiFi users to minimize the maximum latency occurs in the network.
- Implementing the algorithm on exemplary floor plans with known users' distributions.

US Department of Energy (DOE) Oct 2020 –
Multi-stage optimization of ultrasonic food drying process

- Developing a combinatorial optimization algorithm to simultaneously determine the optimal sequence and the associated controllable parameters of a novel convective/ultrasonic food dryer to minimize the total energy consumption of the process while guaranteeing the desired properties (moisture content, color, etc.) of the final product.
- Design and Implementation of control systems (sensor placement, system identification, PID controller and low-pass filter design) for thermal system and AC motor of the convective/ultrasonic food dryer.

Control Systems Lab; Sharif University of Technology Sep 2018 – Aug 2019
Optimization of drug consumption dosage in chemotherapy

- Optimization of dose schedules for chemotherapy using optimal PID control to reduce adverse effects of chemotherapeutic drugs while ensuring sufficient reduction in tumor volume.

Course projects

- Machine Learning:
  - Implemented a single-layer neural network for emotion classification of grayscale facial images.
  - Implemented a multi-layer convolutional neural network for classification of handwritten digits.
  - Implemented and trained a Variational Auto-Encoder and a Generative Adversarial Network on MNIST digits.
  - implemented a tabular Q-learning algorithm to train an agent to play the game 'Taxi-v3'.
- Dynamic programming and Reinforcement Learning:
  - Implemented value-iteration, policy-iteration, Online Q-Learning, Temporal difference, and Monte Carlo learning on gridworld and table tennis game.
- Computer Vision:
  - Implemented SIFT(Scale-invariant Feature Transformation), Reconstructing 3D surfaces using images taken by different light source directions, Homography transformation stitching, and facial key points detection using deep learning.

Experiences

Graduate Research Assistant Aug 2020 – present
Systems engineering lab for nano investigation and control (SENSIC) *UIUC*

Undergraduate Research Assistant Sep 2018 – Aug 2019
Control Systems Lab *Sharif University of Technology*

Teaching Assistant Sep 2019 – Dec2019
Composite Materials Course *Sharif University of Technology*

Undergraduate Intern June 2018 – Sep 2018
Dam engineering projects, flood control and water resources development *AFCE, Iran*

Honors and Awards

- University of Illinois at Urbana Champaign MechSE department first year fellowship (30000$) **(Fall 2020)**
- Ranked 326^{th} (top 0.2%) in Iranian national university entrance exam among 181600 participants **(Fall 2015)**

Skills

Programming Languages: Python, MATLAB, LaTeX, C

Softwares and Frameworks: NumPy, Pytorch, Simulink, LabView, OpenCV, Pillow Solidworks

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