Fatemeh Naeinian

New York University, Department of Electrical and Computer Engineering
fn2174@nyu.edu fatemeh-naeinian FatemehNaeinian

Education

New York University **Jan 2025 – present**
PhD in Electrical Engineering *New York City, USA*
- GPA : 3.9/4

University of Tehran **Sep 2019 – Jun 2024**
B.Sc in Electrical Engineering *Tehran, Iran*
- GPA : 18.53/20 (3.83/4)

University of Tehran **Sep 2021 – Jun 2024**
Minor in Computer Engineering *Tehran, Iran*
- GPA : 16.76/20 (3.4/4)

Publications

- **F. Naeinian**, A. Hamza, H. Zhu, A. Choromanska, "Zero-Shot Cross-City Generalization in End-to-End Autonomous Driving: Self-Supervised versus Supervised Representations", arXiv preprint arXiv:2603.11417.
- **F. Naeinian**, E. Balazadeh, M. Tale Masouleh, "Mapping Human Grasping to 3-Finger Grippers: A Deep Learning Perspective", *2024 32nd International Conference on Electrical Engineering (ICEE)*, pp. 1–7, 2024.

Research Interests

- End-to-end autonomous driving systems
- Cross-domain generalization
- Self-supervised and representation learning
- Motion forecasting and trajectory prediction
- Multi-modal perception and sensor fusion
- World Models

Research Experience

Graduate Research Assistant, Learning Systems Laboratory **New York University**
Advisor: Prof. Anna Choromanska *Jan 2025 – present*
- Investigating strategies for improving the **generalization of autonomous driving systems** across diverse urban environments without the need for retraining.
- Applying **self-supervised representation learning** to enhance transferability of trajectory and control predictions across domains.
- Designing scalable **data processing and visualization pipelines**, including multi-view overlays, to compare predicted behaviors against ground truth.
- Conducting cross-domain evaluations to develop **robust, adaptable autonomous driving frameworks** suitable for real-world deployment.

B.Sc Thesis **University of Tehran**
TaarLab: The Human and Robot Interaction Lab *Jul. 2023 – Mar. 2024*
- Built a dataset of human hand features for mapping grasping behaviors to a 3-finger gripper.
- Used MediaPipe to extract and label finger coordinates for high-quality model inputs.
- Trained and evaluated **Object Detection** models to identify optimal grasping points.

Internship **Remote**
Technical University of Munich *Summer 2022*
- Conducted Boundary Computation for determining the Reachable Set of Robotic Manipulators.

Leadership & Mentorship

- **Mentor, NYU Arise Program**, New York, NY Summer 2025
  Supervised a team of high school students on a machine learning project, guiding them through dataset preparation, model training, and result evaluation. Mentored students in scientific communication, leading to a successful poster presentation at the program's closing event.

Relevant Coursework

New York University

- Advanced Machine Learning
- Applied Matrix Theory
- Digital Signal Processing
- Deep learning
- Computer Vision
- Probability and Stochastic Process

University of Tehran

- Neural Networks
- Machine Learning
- Artificial Intelligence
- Data Structures and Algorithms
- Fundamentals of Mechatronics Engineering
- Advanced programming

Honors and Awards

- Received the School of Engineering (SoE) PhD Fellowship at NYU for an academic year, 2025.
- Ranked within the Top 20% among more than 116 B.Sc. students of the Electrical Engineering Department at the University of Tehran, 2023.
- Awarded the Supporter Foundation of the University of Tehran Honorable Award for Academic Excellence, 2019-2021.
- Ranked 3^{rd} in the Control branch of Electrical Engineering, 2023.
- Ranked among the top 0.1% (92^{nd}) in the nationwide university entrance exam in Mathematics and Physics fields for a B.Sc. degree, 2019.
- Ranked among the top 0.1% (91^{th}) in the nationwide university entrance exam in Foreign Languages fields for a B.Sc. degree, 2019.
- Gold Prize in Tebyan Student Projects Festival in computer seminars, 2017.

Skills

Programming Languages & Frameworks :

- Proficient in Python, MATLAB, C, C++, Verilog
- Familiar with TensorFlow, NumPy, Pandas, Pyomo, Matplotlib, Keras, scikit-learn, PyTorch, Seaborn, CSS, HTML, JavaScript

Softwares & Developer Tools :

- Familiar with Jupyter Notebook, Google Colab, ModelSim, Quartus II, MultiSim, STM32CubeIDE, LaTeX, Visual Studio Code, Arduino

Teaching Experience

Course Assistant at New York University:

- Digital Signal Processing (Fall 2025)

Teaching Assistant at the University of Tehran:

- Neural Networks and Deep Learning (Spring & Fall 2023)
- Linear Control Systems (Fall 2023)
- Probability and Statistics (Spring 2023)
- Linear Control Systems (Fall 2022)
- Electrical Machines (Fall 2021)
- Engineering Mathematics (Fall 2022 & Spring & Fall 2023)
- Operational Research (Fall 2023)
- Linear Algebra (Fall 2022)
- Electronics I (Spring 2021)
- Introduction to Electrical Engineering (Spring 2021)

Languages

- **English** [Advanced Proficiency]
- **Persian** [Native]