Niloofar Ramroodi

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Educations

University of Minnesota, MN, USA, Sep. 2023 - Present
Ph.D. Mechanical Engineering
GPA: -

University of Tehran, Tehran, Iran, Oct. 2021 - Aug. 2023
M.Sc. Mechanical Engineering
GPA: 18.09/20 (4/4)

University of Tehran, Tehran, Iran, Sept. 2016 - Feb. 2021
B.Sc. Mechanical Engineering
GPA: 16.78/20 (3.58/4), Last two years GPA: 18.06/20 (3.96/4)

Fields of Interest

- Data-Driven Modeling
- Applied Machine Learning
- Control
- Intelligent Systems
- Bioengineering

Publications

- **N. Ramroodi**, A. Sadighi, and M. Robati. Fault Diagnosis using Dynamic Mode Decomposition, *In progress*
- E. Norouzi Farahani, **N. Ramroodi**, and M. Mahnama. Optimum design of a micro-positioning compliant mechanism based on neural network metamodeling, *Journal of Computational Applied Mechanics*, 2023, DOI: 10.22059/JCAMECH.2023.351454.775
- **N. Ramroodi**, F. A. Shirazi, M. Mahnama, and M. Khanloghi. Control design of a compliant parallel mechanism. *Journal of Mechanical Engineering University of Tabriz, 86*(41), 2021, DOI: 10.22034/jmeut.2022.48866.3007
- E. Norouzi Farahani, **N. Ramroodi**, and M. Mahnama. *Vibrational analysis of parallel compliant mechanism applied in atomic force microscopy*, 10th International Conference on Acoustics and Vibration (ISAV-1063), Tehran, 2021. Available: https://civilica.com/doc/1163364/

Experience

- Research Assistant at SEECS Laboratory Dec. 2021 - Aug. 2023
  - Supervisor: Dr. A. Sadighi
  - M.Sc. Thesis: Fault Diagnosis of Mechatronics Systems using Dynamic Mode Decomposition: In this project, the motion of a non-linear system regulates using adaptive strategies. Different sections are: 1- System Identification with DMDc, 2- An anomaly detection model based on Auto-Encoder, 3- An embedded system to detect abnormalities in real-time
- Research Assistant at Troubleshooting and Status Monitoring Laboratory Mar. 2020 - Feb. 2021
  - Supervisor: Dr. F. A. Shirazi
  - B.Sc. Thesis: Controller Design for a Compliant Mechanism: In this thesis, a controller was developed to reduce the error of motion and fine motion tracking of a compliant mechanism. Different sections are: 1- Modeled Piezoelectric hysteresis based on Bouc-Wen's equations, 2- Identified the model parameters using the PSO algorithm, 3- Designed an inverse feedforward/PI. backward controller
- Teaching Assistant of Applied Finite Element Method Course Fall Semester 2020
  - Tasks: Teaching ABAQUS, Grading Students' Assignments
  - Instructor: Dr. M. Mahnama
- Intern at Troubleshooting and Status Monitoring Laboratory Summer 2020
  - Conducted a review of patent and articles on electromagnetic shaker
  - Motion analysis of a shaker using COMSOL Multiphysics
- Intern at Farasanj Abzar Company Summer 2019
  - Conducted a literature review on electromagnetic flowmeter patents

Selected Courses

- Measurement Systems and Instrumentation (18/20)
- Applied Finite Element Method (17.7/20)
- Automatic Control (17.3/20)
- Neural Network (18.68/20)
- Advanced Control (18/20)
- Circuit and Electric Machines (18.5/20)
- Optimization of Mechanical Systems (16.52/20)
- Mechatronics (17/20)
- Adaptive Control (16.65/20)
- Digital Control (17/20)

Online Courses

- Python for Everybody Specialization, UMICH
- Deep Learning Specialization, Deeplearning.AI
- Identification, Estimation, and Learning, MIT
- Machine Learning, SU
- IBM AI Engineering Professional Certificate, IBM
- Control Bootcamp, UW

Selected Projects

- Measurement Systems and Instrumentation
  - A Microcontroller-based Modeling for Digital Thermocouples Design using Arduino software
- Applied Finite Element Method
  - Numerical Simulation of Sharp-Nosed Projectile Impact on Ductile Targets using ABAQUS
- Optimization of Mechanical Systems
  - Modeling and Optimizing a turbine cycle in MATLAB
  - Mathematical Modeling of a Heating System and Bi-Objective Optimization in MATLAB
- Machine learning & Deep Learning Specialization
  - Performing related projects (like Supervised and Unsupervised Learning, Classification, CNN, RNN, GAN, YOLO, Anomaly Detection, Transfer Learning, Image Segmentation, Transformers) in Python with TensorFlow, Panda, PyTorch, scikit-learn, ... libraries
- Adaptive Control
  - MRAC for a hydraulic underwater manipulator using MIT rule in MATLAB
  - Employ offline and online system identification methods in MATLAB
  - Design optimal controllers like MPC, LQR, LQG in MATLAB
- System Identification
  - Offline and online system identification methods like RLS, ELS, SA, PA and LMS in MATLAB

Skills

Programming language:	**Advanced:** Python, MATLAB **Basic:** C++, R
Software:	**Advanced:** Simulink, ABAQUS, SolidWorks, Arduino, Adobe Photoshop **Basic:** Node-RED, ANSYS Fluent, COMSOL, AutoCAD
Others:	LaTeX, SQL
Languages:	Persian (Native), English (TOEFL iBT Score: 105(R: 30, L: 29, S: 20, W: 26), Oct. 2022)

References

- **Dr. Ali Sadighi**,
  Assistant Professor of ME, University of Tehran
  Ph.D., ME, Texas A&M University, 2010
  Email: asadighi@ut.ac.ir
- **Dr. Farzad A. Shirazi**,
  Assistant Professor of ME, University of Tehran
  Ph.D., ME, University of Houston, 2011
  Email: fshirazi@ut.ac.ir
- **Dr. Maryam Mahnama**,
  Assistant Professor of ME, University of Tehran
  Ph.D., ME, Sharif University of Technology, 2013
  Email: m.mahnama@ut.ac.ir
- **Dr. Meghdad Saffaripour**
  Assistant Professor of ME, University of Tehran
  Ph.D., ME, University of Toronto, 2013
  Email: m.saffaripour@ut.ac.ir

Hobbies

Reading Books(Mystery, Sci-Fi, Self-Improvement), Cooking, Listening to Podcasts(Storytelling, Investigative)