Mostafa Nesaeian

Homepage - LinkedIn - Github

nesaeian.mostafa@gmail.com
(+98) 9105714025
Iran, Tehran

RESEARCH INTERESTS

- Machine Learning
- Control Theory
- Applied Mathematics
- Optimization

EDUCATION

Amirkabir University of Technology (Tehran Polytechnic)
Bachelor of Science, Electrical Engineering: 2020 - Present
- GPA: 16.44/20 - 3.44/4 Total: 130 credits

National Organization for Development of Exceptional Talents (Sampad)
High School Diploma, Mathematics and Physics: 2014 - 2020
- GPA: 19.68/20 - 3.96/4

RESEARCH EXPERIENCE

Bachelor Thesis: Neural network based state estimation using Lie derivative 2024

- This thesis considers the problem of state observation for nonlinear dynamics. The problem with model-based observer is due to the need of solving PDEs, this thesis is using online learning and considering the observer dynamics as a Chen-Fliess series. The proposed approach is demonstrated by a oscillating dynamic. (Link)

Research Assistant at Digital Transformation Lab
Research Institute of Petroleum Industry (RIPI)
part-time Mar 2024 - Present

- Researching on Neural Network based Model Predictive Control (MPC) to explore how ML can enhance traditional control systems under supervision of Dr. Saeid Shokri and Dr. S. Vahid Naghavi.

Research Assistant at school of Electrical Engineering
Amirkabir University of Technology (Tehran Polytechnic)
Full-time Dec 2023 - Present

- Researching various state estimation methods under the supervision of Dr. Farzaneh Abdollahi, with a focus on comparing their strengths and weaknesses in diverse applications, particularly exploring Geometric methods for state estimation purposes.

PUBLICATION

- Mostafa Nesaeian, S. Vahid Naghavi, **Neural Network-Based Model Predictive Control for CSTR: A Comparative Study of Output Layer Architectures.**, In preparation

TEACHING

- **Calculus 2: Teaching Assistant** Jan - Jun 2023

Amirkabir University of Technology (Tehran Polytechnic)

- Designing Homeworks and assisting students (GitHub-Link) for 2n semester 2023 in Department of Mathematics and Computer Science.

HONORS AND AWARDS

- Ranked 590 in the National University Entrance Exam among 160,000 students.

WORK EXPERIENCE

Ai Researcher: Research Institute of Petroleum Industry (RIPI) Part-time Mar 2024 - Present

- Designing and developing intuitive and responsive front-end interfaces for web application using React.
- Validation, evaluation and help for backend project using Flask framework.
- Image processing, utilizing neural network to create models for object detection.

Image Processing: Fater Afkar Fanavar Part-time Sep 2023 - Dec 2023
- Working on deepface model, Vgg16 for image processing.
- Working on face vectorizing methods.

Summer Internship : Fater Afkar Fanavar Jul 2023 - Aug 2023
- Designing controllers via python (OpenOPC module) for pilot plant.
- Instrumentation, Simulating and processing sensors.
- Image processing. (Link)

PROJECTS

MSE vs RNN : May 2023
- A comparison study of a Recurrent neural network (RNN) model and a method from this paper published by S. Vahid Naghavi for a chaotic system. (Link)

VHDL simulation of Automated Teller Machine : Apr 2022
- Design, implement, verify, and test an Automated Teller Machine based on the following specification: The teller machine should provide the following services to the user (operator): Balance Inquiry (BAL), Cash Withdrawal (COUT), Deposit Cash (CIN), Deposit a Check (CHEC), Change PIN (CPIN) (Link)

SKILLS

Programming Languages: Python, C/C++
Frameworks and Tools: Tensorflow, Scikit-Learn, Pandas, Numpy, Matplotlib, Git, MATLAB, Flask, React
Development: Linux, PostgreSQL

LANGUAGES

English: Fluent
Persian: Native