Mo Saeidi

Robotics & Control Engineer

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Education

M.Sc. in Automation and Control Engineering
Polytechnic University of Milan (POLIMI), Italy *2023 – Present*
GPA: 27.11/30
Thesis: Learning Policies from Human Demonstrations for Testing Optimization

B.Sc. in Mechanical Engineering
KNTU University, Tehran, Iran *2017 – 2022*
GPA: 3.88/4.0
Thesis: Pattern Recognition of Unbalanced Rigid Rotor Bearing Forces

Publications

Homaeinezhad, M. R. & Saeidi Mostaghim, M. H.
"Nonlinear Tracking Control Algorithm for Dynamical Output Systems Manipulated by the Hardly Constrained Oscillatory Actuator," *Structural Control and Health Monitoring.* View Paper **2023**

Homaeinezhad, M. R. & Saeidi Mostaghim, M. H.
"Synthetic Lyapunov Stabilization Technique for Designing Actuation-Constrained Multi-Input Multi-Output Control Systems," *Journal of the Franklin Institute.* View Paper **2022**

Homaeinezhad, M. R. & Saeidi Mostaghim, M. H.
"Pattern Recognition of Unbalanced Rigid Rotor Bearing Forces," *Amirkabir Journal of Mechanical Engineering*, 54(12), pp. 3591–3606. View Paper **2022**

Conferences

Homaeinezhad, M. R. & Saeidi Mostaghim, M. H.
"Pattern Recognition of Unbalanced Rigid Rotor Bearing Forces," *18th National Conference and 7th International Conference on Manufacturing Engineering in Iran (ICME 2022).* **2022**

Homaeinezhad, M. R. & Saeidi Mostaghim, M. H.
"Constrained Control of Moving Base Robotic System with Cooperative Arms," *30th Annual International Conference of the Iranian Association of Mechanical Engineers*, Tehran, Iran. **2022**

Experience

Researcher, MERLIN Laboratory - POLIMI
October 2024 – Present *Milan, Italy*
Done my Master's thesis titled "Robotic Programming by Demonstration: Segmentation and Via-Set Optimization". Developed three novel algorithms: event-based DTW for accurate interpretation of multiple demonstrations; a segmentation algorithm (SEGDP) and its faster extension with proved

$\mathcal{O}(N)$ complexity; and a Via-Set Optimization module developed to refine the learned skills in runtime. The pipeline was tested by ablation studies and inquiring non-expert users, proving the pipeline's efficacy. Planning to publish a paper and present the findings in a conference.

Researcher, AIRLAB Drone Team - POLIMI
April 2023 – November 2023 *Milan, Italy*
ROS1 to ROS2 translation of navigation and filtering nodes. Developed a high-level navigation and obstacles avoidance, via A* and point clouds (of ZED camera), from scratch in a limited time. Drone Contest of 2023 held in Torino for three days, held by Leonardo.

Research Assistant, Mechatronics Laboratory - KNTU
2021 – 2022 *Tehran, Iran*
Participated in AEB project: computer vision team. Benchmarking monocular depth estimation algorithms, object detection and fusing them. Participated in *ChessTrack* project: gathering and labeling more than 10000 images of chess pieces and training a YOLO; the program used in chess tournaments.

Research Assistant, Vibration and Control Laboratory - KNTU
2019 – 2022 *Tehran, Iran*
Conducted my BSc thesis, simulating a rigid rotor with imbalance disturbution of mass and developing a fault diagnosis NN to detect the where to place the balancing masses, and ultimately reducing the number of required snesors to 2.

Software/Technical Skills

ROS/ROS2	Raspberry Pi/Jetson/Arduino	SolidWorks
C++/MATLAB/Python	Filtering	CATIA
Optimization	CasADi	Fusion 360
Human-Robot Interaction	TensorFlow/PyTorch	ANSYS APDL & Mechanical
Model Predictive Control	Linux	Mujoco
Control Theory	Git	

References

Prof. Paolo Rocco *Full Professor, Politecnico di Milano*
Email: paolo.rocco@polimi.it
Dr. Simone Mentasti *Assistant Professor, Politecnico di Milano*
Email: simone.mentasti@polimi.it
Prof. Simone Garatti *Associate Professor, Politecnico di Milano*
Email: simone.garatti@polimi.it
Prof. Mohammad Reza Homaeinezhad *Associate Professor, KNTU, Tehran, Iran*
Email: mrhomaeinezhad@kntu.ac.ir

Research Interests

Model Predictive Control
Physics-Informed Neural Network
Reinforcement Learning
Control Theory
Learning from Demonstration
Human-Robot Interaction
Manipulation

Languages

Persian (Native) English (TOEFL: 113)