Mohammad (Rayan) Bahrami
Curriculum Vitæ

Department of Mechanical Engineering
Stevens Institute of Technology, NJ 07030, USA

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🖥 https://r-bahrami.github.io

Research Interests	• Cyber-physical Systems	• Machine Learning and System Identification
	• Networked Control Systems	• Optimization
	• Robotics	• Computer Vision

Education

Stevens Institute of Technology, Hoboken, NJ, USA   2019-present
Ph.D. Student in Mechanical Engineering - Robotics & Control

Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran   2015-2017
M.Sc. in Mechanical Engineering - Applied Mechanics

Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran   2011-2015
B.Sc. in Mechanical Engineering

Selected Coursework

- **Computer Science:** Machine Learning, Computer Vision, Pattern Recognition & Classification
- **Control:** Stochastic Control Systems, Robust Control, Nonlinear Control, Adaptive Control
- **Robotics & Dynamical Sys.:** Robotics, Cooperative Autonomous Mobile Robots, Autonomous Navigation for Mobile Robots, Analytical Dynamics
- **Mathematics:** Optimization, Advanced Mathematics.

Professional Experience

Graduate Teaching & Research Assistant   2019 - Present
Stevens Institute of Technology   NJ, USA

Graduate Teaching Assistant
- Lab instructor for ME 470: Mechanical Engineering Systems Lab   Spring '23
- Grader (reader) for ME 225: Dynamics   Spring '23

Graduate Research Assistant, Safe Autonomous Systems Lab   2019 - Present

- Develop a software stack for vision-based autonomous navigation using VOXL flight deck [P2]
- Conduct research on adversarial-resilient vision-guided cooperative control [P2]
- Conduct research on adversarial-resilient coordination over unreliable communication networks [J2]
- Developed Python and ROS packages for implementation and evaluation of multi-robot cooperation and monitoring algorithms in indoor flight experiments [C3]
- Proposed a monitoring framework for privacy-preserving adversary detection in networked multi-agent systems [C2]
- Proposed a monitoring framework for detection of stealthy adversaries for networked unmanned aerial vehicles - Formation Control [C3]

Graduate Research Assistant   2015-2018

Robotics and Servo Systems Lab, Amirkabir University of Technology   Tehran, Iran

- Collaborated in the Design, fabrication and control of a rescue soft robot project
- Proposed a switching control configuration for increased efficiency of electro-hydraulic actuators [C1]
- Proposed a monitoring algorithm for fault detection and reconstruction in electro-hydraulic actuators [J1]

- Proposed a reconfigurable control algorithm for fault-tolerance in electro-hydraulic actuators [part of the Master's thesis]

HONORS AND AWARDS	
• **The 2023 Fernando Fernandez Ph.D. Robotics and Automation Summer Term Fellowship**, Stevens Institute of Technology	2023
• **Best Student Presentation**, STRATUS Conference, SUNY ESF, Syracuse, NY	2022
• **Provost Fellowship** Award, Stevens Institute of Technology	2019
• **Outstanding Contribution in Reviewing**, Elsevier ISA Transactions	2017

PUBLICATIONS
(peer-reviewed)

Journal Article

[J2] **Bahrami, M.**, Zareinejad, M., et al. Under Review - 2023
"A Distributed Monitoring Framework for Adversarial-Resilient Cooperative Control over Unreliable Communication Networks"

[J1] **Bahrami, M.**, Zareinejad, M., et al. **ISA Transactions - Elsevier, 2018**
"Adaptive super-twisting observer for fault reconstruction in electro-hydraulic systems"

Conference Proceedings

[C2] **Bahrami, M.**, Jafarnejadsani, H. **IEEE ICUAS, 2022**
"Detection of Stealthy Adversaries for Networked Unmanned Aerial Vehicles"

[C2] **Bahrami, M.**, Jafarnejadsani, H. **IEEE 60th CDC, 2021**
"Privacy-Preserving Stealthy Attack Detection in Multi-Agent Control Systems"

[C1] **Bahrami, M.**, Tivay, A., et al **IEEE RSI/ISM 4th ICROM, 2016**
"An energy-saving robust motion control of redundant electro-hydraulic servo systems"

PRESENTATIONS

- The 2022 Int´l Conference on Unmanned Aircraft Systems (ICUAS '22)[†], June 2022
Dubrovnik, Croatia.
- The Systems and Technologies for Remote Sensing Applications Through Unmanned Aerial Systems (STRATUS 2022 Conference)[*], SUNY-ESF, Syracuse, NY, USA May 2022
*Best Student Oral Presentation.
- The 60th IEEE Conference on Decision and Control (CDC)[†], Austin, Texas, USA Dec. 2021
- The 4th RSI International Conference on Robotics and Mechatronics[††], Oct. 2016
University of Tehran, Tehran, Iran.
[†] Virtual Presentation due to the COVID-19 pandemic. [††] Poster Presentation.

PROFESSIONAL SERVICE

- **Reviewer**: Elsevier - ISA Transactions Journal, IEEE Transactions on Control of Network Systems (TCNS), IEEE International Conference on Robotics and Mechatronics (ICRoM)
- **Member of Societies**: Institute of Electrical and Electronics Engineers (IEEE), IEEE Young Professionals.

RELEVANT SKILLS

- Programming Languages & lib.: Python (Scikit-learn, PyTorch, OpenCV, TensorFlow, TFLite, Keras, Socket), C++, MATLAB, YALMIP, Git, GitHub, Docker
- Engineering Software: ROS, PX4, AirSim, Simulink, SolidWorks, MSC Adams, ANSYS-Workbench and Proteus (familiar), LabVIEW (data acquisition)
- Hardware: Motion Capture Systems (VICON), Data-Acquisition (dSPACE), ARM Microcontroller Programming (basic), Nvidia Jetson Developer Kit, ModalAI VOXL-Flight Deck, Jackal UGV
- Published Software (open source):
TelloSwarm: https://github.com/SASLabStevens/TelloSwarm;
Framework and example applications for multi-UAV control and monitoring (e.g. formation, swarming, adversary detection). Written in Python with ROS communication.