Ali **Wadi**

Instructor | Researcher | Mechanical Engineer | MSc | EIT

linktr.ee/awadi · linkedin.com/in/wadiali · github.com/ali94wadi · awadi@ieee.org · +971 505 387 387 · Sharjah, UAE

I'm an experienced roboticist with over **8** years of experience in higher education and scientific research. My interests span Modeling, Dynamics, Control, Estimation, Fault Detection & System Identification.

Education

Ph.D. in Aerospace Engineering, Georgia Institute of Technology, USA. *GPA: 4.0/4.0* — 2028
M.Sc. in Mechanical Engineering, American University of Sharjah, UAE. *GPA: 3.71/4.0* — 2017
B.Sc. in Mechanical Engineering, American University of Sharjah, UAE. *Cum Laude Honors*. — 2015

Experience

Graduate Research Assistant, Georgia Institute of Technology, GA, USA — Jan 2024 → $Present$

- I am working under Dr. Kyriakos Vamvoudakis in the Intelligent Cyber-Physical Systems Lab.

Instructor, American University of Sharjah, Sharjah, UAE — Mar 2018 → $Jan2024$

- Taught undergraduate and graduate Mechanical and Mechatronics Engineering laboratory courses.
- Worked on the continued development of curricula and teaching material, including creating/revamping new/existing courses.
- Served the Mechanical Engineering Department and the College of Engineering in events, committees, etc.
- Managed the AUS Mechatronics Center; supervising activities, dispersing operational budget, etc.
- Enforced safe-working conditions in the labs, including commissioning and maintaining equipment.
- Supported the needs of capstone projects and theses, including hardware selection and experimental setups.
- Developed learning modules and certification/executive education programs serving governmental entities, university students, high school students, etc. Courses include: Dubai Municipality Robotic 3D Printing, AUS Drones Academy, MCE Explore, Design & Build Bootcamp, AUS Engineering Day, and others.

Teaching & Research Assistant, American University of Sharjah, Sharjah, UAE — Jan 2015 → $Dec2017$

- Supported the instruction of undergraduate/graduate courses, recitations, and laboratories however necessary.
- Worked on multiple research projects that resulted in refereed journal publications and conference proceedings.

Engineering Trainee, Khatib & Alami, Abu Dhabi, UAE — Aug 2015 → $Sep2015$

- Performed inspections for HVAC, water, and firefighting installations. Processed inspection reports, information requests, etc.

Certifications

MicroMasters. Statistics and Data Science, Massachusetts Institute of Technology (MITx). In progress (66% complete). — 2024
Coursera Specialization. MathWorks Computer Vision for Engineering and Science. Verification Link. — 2023
Coursera Specialization. MathWorks Image Processing for Engineering and Science. Verification Link. — 2023
Nano-Degree. Udacity Flying Car and Autonomous Flight Engineer. Verification Link. — 2023
Coursera Specialization. Stanford Machine Learning. Verification Link. — 2022
Nano-Degree. Udacity Robotics Software Engineer. Verification Link. — 2022
Nano-degree. Udacity Self-driving Car Engineer & Intro to Self-Driving Cars. Verification Link 1. Verification Link 2. — 2022
Training. Trained to be a *Certified LabVIEW Associate Developer*. — 2020
Training. Trained in *American Heart Association* first aid. — 2018
Certification. Passed the NCEES Engineer in Training/Fundamentals of Engineering (EIT/FE) Exam. Verification Link. — 2015

Achievements

Team shortlisted as a finalist in the Dubai World Challenge for self-Driving Transport 2023. — 2023
Awarded the American University of Sharjah Outstanding Interdisciplinary Research Team Award. — 2023
Team won 3^{rd} place developing a mobile robot solution for Emirates Global Aluminium (EGA) smelter inspection. — 2020
Awarded full studentship to pursue graduate studies at the American University of Sharjah. — 2016
Finalist in the poster competition at the ISMA' 15 conference held at the American University of Sharjah. — 2015
Awarded the Dean's and Chancellor's academic excellance honors, 7 and 3 times respectively. — 2015
Awarded merit Scholarship upon joining the American University of Sharjah. — 2011

Extracurricular

Served as a mentor and a judge for the Lockheed Martin-sponsored First Tech Challenge (FTC) held in the UAE. — 2019
Served as a judge for the 20^{th} season of the First Lego League (FLL) held in the UAE. — 2018
Graduate Student Association board member; represented the graduate student body, organized workshops & events. — 2017

Skills

Programming Languages MATLAB, Python, ROS, LabVIEW, C/C++
Softwares ANSYS, AutoCAD, Inventor, Comsol, Gazebo, ADAMS

Languages

English
Arabic

Publications

Forthcoming:

[1] **Ali Wadi** et al. "Trajectory-Informed Learning for Quantum Optimal Control of Uncertain Systems". In: *IEEE* (2024).

[2] Ahmed M. Yasin et al. "Estimating The Capacity of Li-ion Batteries using Kalman Filters". In: *TBD* (2024).

[3] Samer Sarkis et al. "Robust Estimation of the Triggered Release of Chemotherapeutic Drugs from Moieties". In: *TBD* (2024).

[4] **Ali Wadi** et al. "Adaptive Nussbaum Functions in The Parsimonious Discovery of Dynamics". In: *Communications in Nonlinear Science and Numerical Simulation* (2024).

Published:

[5] Sherif Ismail et al. "A Noise-Resilient Observer for Enhanced Surface Temperature Estimation of Li-ion Battery Cells". In: *IEEE Transactions on Transportation Electrification* (2024).

[6] **Ali Wadi** et al. "Mitigating Motion Sickness in Autonomous Vehicles for Improved Passenger Comfort". In: *IEEE Access* 12 (2024), pp. 62709–62718. DOI: 10.1109/ACCESS.2024.3386863.

[7] **Ali Wadi** et al. "Probabilistic Voltage Fault Correction Method for Lithium-ion Batteries Using a Decentralized Cell Voltage Measurement Approach". In: *IEEE Transactions on Vehicular Technology* 72.11 (2023), pp. 14166–14178. DOI: 10.1109/TVT.2023.3287128.

[8] **Ali Wadi** et al. "A novel localization-free approach to system identification for underwater vehicles using a Universal Adaptive Stabilizer". In: *Ocean Engineering* 274 (2023), p. 114013. DOI: doi.org/10.1016/j.oceaneng.2023.114013.

[9] **Ali Wadi** et al. "An Invariant Method for Electric Vehicle Battery State-of-Charge Estimation Under Dynamic Drive Cycles". In: *IEEE Access* 11 (2023), pp. 8663–8673. DOI: 10.1109/ACCESS.2023.3237972.

[10] Wasim Al-Masri et al. "Partial Discharge Localization in Power Transformers Using Invariant Extended Kalman Filter". In: *IEEE Transactions on Instrumentation and Measurement* 72 (2023), pp. 1–10. DOI: 10.1109/TIM.2023.3239642.

[11] Mahroo Sajid et al. "An Enhanced Fusion Algorithm With Empirical Thermoelectric Models for Sensorless Temperature Estimation of Li-ion Battery Cells". In: *IEEE/ASME Transactions on Mechatronics* (2023), pp. 1–11. DOI: 10.1109/TMECH.2023.3235726.

[12] Ishaq Hafez et al. "Variational Bayesian-Based Maximum Correntropy Cubature Kalman Filter Method for State-of-Charge Estimation of Li-ion Battery Cells". In: *IEEE Transactions on Vehicular Technology* (2022), pp. 1–15. DOI: 10.1109/TVT.2022.3216337.

[13] **Ali Wadi** et al. "Computationally Efficient State-of-Charge Estimation in Li-Ion Batteries Using Enhanced Dual-Kalman Filter". In: *Energies* 15.10 (2022). DOI: 10.3390/en15103717.

[14] **Ali Wadi** et al. "Identifying Friction in a Nonlinear Chaotic System Using a Universal Adaptive Stabilizer". In: *IEEE Access* 10 (2022), pp. 39177–39192. DOI: 10.1109/ACCESS.2022.3165081.

[15] Samer S. Sarkis et al. "Novel Design of a Hybrid Drone System for Cleaning Solar Panels". In: *2022 Advances in Science and Engineering Technology International Conferences (ASET)*. 2022, pp. 1–6. DOI: 10.1109/ASET53988.2022.9735056.

[16] Ahmed M. Elsergany et al. "An Adaptive Autotuned Polynomial-Based Extended Kalman Filter for Sensorless Surface Temperature Estimation of Li-Ion Battery Cells". In: *IEEE Access* 10 (2022), pp. 14038–14048. DOI: 10.1109/ACCESS.2022.3148281.

[17] **Ali Wadi** et al. "Enhanced EKF Method for State-of-Charge Estimation of Electric Vehicles' Li-ion Batteries under Highly Dynamic Power Profiles". In: *2021 4th International Symposium on Advanced Electrical and Communication Technologies (ISAECT)*. 2021, pp. 1–6. DOI: 10.1109/ISAECT53699.2021.9668406.

[18] Mahroo Sajid et al. "An Extended Kalman Filter with Exponential Thermoelectric Measurement Model for Sensorless Surface Temperature Estimation of Li-ion Batteries". In: *2021 IEEE Energy Conversion Congress and Exposition (ECCE)*. 2021, pp. 5903–5906. DOI: 10.1109/ECCE47101.2021.9595866.

[19] **Ali Wadi** et al. "Alleviating Dynamic Model Uncertainty Effects for Improved Battery SOC Estimation of EVs in Highly Dynamic Environments". In: *IEEE Transactions on Vehicular Technologies* (2021). DOI: 10.1109/TVT.2021.3085006.

[20] **Ali Wadi** et al. "Multi-Model Investigation and Adaptive Estimation of the Acoustic Release of a Model Drug from Liposomes". In: *IEEE Transactions on Nanobioscience* 19.1 (2020), pp. 68–77. DOI: 10.1109/TNB.2019.2950344.

[21] **Ali Wadi** et al. "Mitigating the Effect of Noise Uncertainty on the Online State-of-Charge Estimation of Li-Ion Battery Cells". In: *IEEE Transactions on Vehicular Technology* 68.9 (2019), pp. 8593–8600. DOI: 10.1109/TVT.2019.2928047.

[22] **Ali Wadi** et al. "A novel disturbance-robust adaptive trajectory tracking controller for a class of underactuated autonomous underwater vehicles". In: *Ocean Engineering* 189 (2019), p. 106377. DOI: 10.1016/j.oceaneng.2019.106377.

[23] **Ali Wadi** et al. "Modeling and bias-robust estimation of the acoustic release of chemotherapeutics from liposomes". In: *Journal of Biomedical Nanotechnology* 15.1 (2019), pp. 162–169. DOI: 10.1166/jbn.2019.2672.

[24] **Ali Wadi** et al. "Accurate Estimation of Partial Discharge Location using Maximum Likelihood". In: *IEEE Sensors Letters* 2.4 (2018), pp. 1–4. DOI: 10.1109/lsens.2018.2878922.

[25] **Ali Wadi** et al. "Modeling and system identification of an autonomous underwater vehicle". In: *11th International Symposium on Mechatronics and its Applications (ISMA)*. Vol. 2018-January. 2018, pp. 1–6. DOI: 10.1109/ISMA.2018.8330130.

[26] **Ali Wadi** et al. "Nonlinear sliding mode control of the Furuta pendulum". In: *11th International Symposium on Mechatronics and its Applications (ISMA)*. Vol. 2018-January. 2018, pp. 1–5. DOI: 10.1109/ISMA.2018.8330131.

[27] **Ali Wadi** et al. "Identification of the Uncertainty Structure to Estimate the Acoustic Release of Chemotherapeutics from Polymeric Micelles". In: *IEEE Transactions on Nanobioscience* 16.7 (2017), pp. 609–617. DOI: 10.1109/TNB.2017.2736021.

[28] **Ali Wadi** et al. "Dynamic Analysis of the Tilted Furuta Pendulum". In: *MATEC Web of Conferences*. Vol. 104. 2017. DOI: 10.1051/matecconf/201710402011.