Ali **Wadi**

Instructor | Researcher | Mechanical Engineer | MSc | EIT

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I'm an experienced roboticist with over **7** years of experience in higher education and scientific research. My interests span Modeling, Dynamics, Control, Estimation, Fault Detection & System Identification.

I am on the look out for challenges where I can apply my unique background to tackle interesting projects.

Education & Certifications

2024 **MicroMasters.** Statistics and Data Science, Massachusetts Institute of Technology (MITx). In progress (25% complete).
2017 **M.Sc.** in Mechanical Engineering, American University of Sharjah, UAE. *GPA: 3.71*
Thesis*: Modeling and Guidance of an Underactuated Autonomous Underwater Vehicle.*
2015 **B.Sc.** in Mechanical Engineering, American University of Sharjah, UAE. *Cum Laude Honors*.

2023 **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.
2022 **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.
2020 **Training.** Trained to be a *Certified LabVIEW Associate Developer*.
2018 **Training.** Trained in *American Heart Association* first aid.
2015 **Certification.** Passed the NCEES Engineer in Training/Fundamentals of Engineering (EIT/FE) Exam. Verification Link.

Experience

Instructor, American University of Sharjah, Sharjah, UAE — Mar 2018 →Present

- Teaching undergraduate and graduate laboratories in the dynamics, instrumentation, control, robotics and design tracks.
- Managing the AUS Mechatronics Center; supervising activities, dispersing operational budget, etc.
- Supporting the continued development of curricula and teaching material, including creating/revamping new/existing courses.
- Serving the Mechanical Engineering Department and the College of Engineering in events, committees, etc.
- Enforcing safe-working conditions in the labs, including commissioning and maintaining equipment.
- Supporting the needs of capstone projects and theses, including hardware selection and experimental setups.
- Developing 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 →Dec 2017

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

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

- Performed daily inspections for HVAC chilled water system, water supply/drainage, and firefighting installations.
- Processed contractor submittals, inspection reports, and information requests.

Skills

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

Languages

English
Arabic

Achievements

2023 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.
2020 Team won 3^{rd} place developing a mobile robot solution for Emirates Global Aluminium (EGA) smelter inspection.
2016 Awarded full studentship to pursue graduate studies at the American University of Sharjah.
2015 Finalist in the poster competition at the ISMA' 15 conference held at the American University of Sharjah.
2015 Made it to the Dean's and Chancellor's academic excellance honors lists, 7 and 3 times respectively.
2011 Awarded merit Scholarship upon joining the American University of Sharjah.

Extracurricular

2022 Delivered experimental executive education sessions to the Dubai Municipality under the theme: *Robotic 3D Printing.*
2019 Served as a mentor and a judge for the Lockheed Martin-sponsored First Tech Challenge (FTC) held in the UAE.
2018 Served as a judge for the 20^{th} season of the First Lego League (FLL) held in the UAE.
2017 Graduate Student Association board member; represented the graduate student body, organized workshops & events.

Publications

Forthcoming:

[1] **Ali Wadi** et al. "Adaptive Parameter Identification for Rigid-body Dynamic Systems". In: *TBD* (2023).
[2] Baker Mohammad Shehadeh et al. "Intelligent System Identification for Aerial Vehicles". In: *TBD* (2023).
[3] Ahmed M. Yasin et al. "Estimating The Capacity of Li-ion Batteries using Kalman Filters". In: *TBD* (2023).
[4] Samer Sarkis et al. "Robust Estimation of the Triggered Release of Chemotherapeutic Drugs from Moieties". In: *TBD* (2023).
[5] Sherif Ismail et al. "A Review of Kalman Filter-aiding Techniques for Li-ion Battery Management Systems". In: *TBD* (2023).
[6] Enas Gabashneh et al. "Adaptive Fuzzy Potential Field Guidance for Wheeled Mobile Robots". In: *TBD* (2023).
[7] **Ali Wadi** et al. "Adaptive Nussbaum Functions in The Parsimonious Discovery of Dynamics". In: *Communications in Nonlinear Science and Numerical Simulation* (2023).
[8] Sara Tellab et al. "Design and Implementation of a Semi-automomous Aluminum Potshell Inspection Robot". In: *TBD* (2023).
[9] Shayok Mukhopadhyay et al. "Distance Relaying in Power Transmition Lines". In: *TBD* (2023).
[10] Sherif Ismail et al. "Outlier-Robust and Noise-Immune Li-ion Battery Cells' Surface Temperature Estimation". In: *IEEE Transactions on Vehicular Technology* (2023).

Published:

[11] **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* (2023), pp. 1–13. DOI: 10.1109/TVT.2023.3287128.
[12] **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.
[13] **Ali Wadi** et al. "An Invariant Method for Electric Vehicle Battery State-of-Charge Estimation Under Dynamic Drive Cycles". In: *IEEE Access* (2023), pp. 1–1. DOI: 10.1109/ACCESS.2023.3237972.
[14] 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.
[15] 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.
[16] 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.
[17] **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.
[18] **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.
[19] 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.
[20] 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.
[21] **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.
[22] 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.
[23] **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.
[24] **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.
[25] **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.
[26] **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.
[27] **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.
[28] **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.
[29] **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.
[30] **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.
[31] **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.
[32] **Ali Wadi** et al. "Dynamic Analysis of the Tilted Furuta Pendulum". In: *MATEC Web of Conferences*. Vol. 104. 2017. DOI: 10.1051/matecconf/201710402011.