

Ali WADI

Ph.D. Student | Researcher | Mechanical/Aerospace Engineer | 2×M.Sc. | EIT

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An experienced academic with over 9 years of experience in higher education and scientific research. My research interests are at the intersection of [Robotics](#), [System Identification](#), [Control Theory](#), [Game Theory](#), [Cyber-physical Systems](#), and [Reinforcement Learning](#).

EDUCATION

Ph.D. in Aerospace Engineering, Georgia Institute of Technology, USA. <i>Summa Cum Laude. Minor in Mathematics.</i>	2028
M.Sc. in Electrical and Computer Engineering, Georgia Institute of Technology, USA. <i>Summa Cum Laude.</i>	2027
M.Sc. in Aerospace Engineering, Georgia Institute of Technology, USA. <i>Summa Cum Laude.</i>	2025
M.Sc. in Mechanical Engineering, American University of Sharjah, UAE. <i>Magna Cum Laude.</i>	2017
B.Sc. in Mechanical Engineering, American University of Sharjah, UAE. <i>Cum Laude.</i>	2015

EXPERIENCE

Graduate Research Assistant, Georgia Institute of Technology, GA, USA	01/2024 → Present
➤ I am working under Dr. Kyriakos Vamvoudakis at the Intelligent Cyber-Physical Systems Lab of Georgia Tech. ➤ Our research draws from control theory, game theory, cyberphysical systems, safe autonomy, and reinforcement learning.	
Instructor, American University of Sharjah, Sharjah, UAE	03/2018 → 01/2024
➤ Taught undergraduate and graduate Mechanical and Mechatronics Engineering courses. ➤ Developed curricula and teaching material, including creating/revamping new/existing courses. ➤ Was integral to the proposal and accreditation of the Intelligent Systems and Mechatronics major launched in 2024. ➤ 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 and Build Bootcamp, AUS Engineering Day, and others.	
Teaching and Research Assistant, American University of Sharjah, Sharjah, UAE	01/2015 → 12/2017
➤ Delivered undergraduate and graduate-level instruction through recitations and lab sessions. ➤ Performed research in mechanical and mechatronics engineering, leading to peer-reviewed publications. ➤ Provided technical assistance for student projects, encompassing hardware/software integration and problem-solving.	

CERTIFICATIONS

MicroMasters. MITx Statistics and Data Science. In progress (66% complete).	2026
Coursera Certificate. KAIST Introduction to Quantum Information. Verification Link.	2025
EdX Certificate. DelftX Fundamentals of Quantum Information. Verification Link.	2025
Coursera Certificate. Game Theory, Stanford and University of British Columbia. Verification Link.	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 and Intro to Self-Driving Cars. Verification Link 1. Verification Link 2.	2022
Training. Trained to be a <i>Certified LabVIEW Associate Developer</i> .	2020
Training. Trained in <i>American Heart Association</i> 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 excellence 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
Served as a board member in the Graduate Student Association at AUS.	2017

TEACHING

Instructor, the American University of Sharjah, Sharjah, UAE

01/2015 → 01/2024

- MCE216L - Intro. to Engineering Drawing and Workshop
- MCE220 - Engineering Statics
- MCE222 - Engineering Dynamics
- MCE236L - Solid Modeling
- MCE226L - Comp. Applications in Mech. Engineering I
- MCE326L - Comp. Applications in Mech. Engineering II
- MCE311L - Intro. to Engineering Instrumentation
- MCE345L - Thermofluids Laboratory
- MCE410L - Control Systems
- MCE473L - Finite Element Analysis
- MTR550L - Introduction to Robotics
- MTR650 - Linear Estimation

SERVICE

Reviewer for the following journals:

- Automatica (2)
- Nature Communications (1)
- IEEE Transactions on Automatic Control (3)
- Journal of the Franklin Institute (2)
- European Journal of Control (4)
- Asian Journal of Control (1)
- IEEE/ASME Transactions on Mechatronics (2)
- IEEE Access (1)
- IEEE Sensors Journal (1)
- IEEE Transactions on Systems, Man, and Cybernetics (3)
- IEEE Transactions on Transportation Electrification (3)
- Elsevier Ocean Engineering (4)
- Journal of Energy Storage (5)
- Journal of Optimization Theory and Applications (1)
- Elsevier Robotics and Autonomous Systems (1)
- Springer Nature Scientific Reports (7)
- Springer Nature Discover Artificial Intelligence (1)
- Springer Nature Electrical Engineering (1)
- Springer Nature Sustainable Futures (1)
- Springer Nature Discover Electronics (2)
- Springer Nature Nonlinear Dynamics (1)
- Elsevier Energy and AI (3)
- Elsevier Sustainable Futures (1)

Reviewer for the following Conferences:

- Conference on Decision and Control (2)
- American Control Conference (4)
- Learning for Dynamics and Control Conference (1)
- Conference on Control Technology and Applications (2)

SKILLS

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

LANGUAGES

English ● ● ● ● ●
Arabic ● ● ● ● ●

PUBLICATIONS

Forthcoming:

- [1] **Ali Wadi** and Kyriakos Vamvoudakis. "Trajectory-Informed Learning for Quantum Optimal Control of Uncertain Systems". In: *Automatica* (2025).
- [2] **Ali Wadi** and Kyriakos Vamvoudakis. "Learning-based Optimal Quantum Kinodynamic Motion Planning". In: *TBA* (2025).
- [3] **Ali Wadi** and Kyriakos Vamvoudakis. "Quantum Optimal Control Allocation". In: *TBA* (2025).
- [4] **Ali Wadi** and Kyriakos Vamvoudakis. "Approximating Nash Equilibria for Large Quantum Poly-Matrix Games". In: *TBA* (2025).
- [5] Efstratios Reppas, **Ali Wadi**, Brendan Gould, and Kyriakos Vamvoudakis. "Quantum Deception: Honey-X Deception using Quantum Games". In: *TBA* (2025).
- [6] **Ali Wadi** and Shayok Mukhopadhyay. "Adaptive Nussbaum Functions in The Parsimonious Discovery of Dynamics". In: *TBA* (2025).
- [7] Karim Diab, **Ali Wadi**, Mamoun F. Abdel-Hafez, and Ala A. Hussein. "High-Integrity Photovoltaic Maximum Power Point Tracking Algorithm". In: *TBA* (2025).
- [8] Karim Diab, **Ali Wadi**, and Mamoun F. Abdel-Hafez. "A Non-parametric Gaussian Process-based Robust Navigation Solution". In: *TBA* (2025).

Published:

- [9] Ahmad Yasin et al. "Improved Capacity Estimation Method for Li-ion Battery Cells Using a Modified Kalman Filter and a Cell Thermal Model". In: *IEEE Transactions on Instrumentation and Measurement* (2025), pp. 1–1. doi: **10.1109/TIM.2025.3548253**.
- [10] Basil Al attar, Ala A. Hussein, **Ali Wadi**, and Mamoun F. Abdel-Hafez. "Capacity Estimation of Li-Ion Battery Cells Using Temperature-Based Extended Kalman Filter". In: *IEEE Energy Conversion Conference and Expo. 2025*.
- [11] **Ali Wadi** and Kyriakos G. Vamvoudakis. "Trajectory-Informed versus Physics-Informed Machine Learning Methods for Dynamic Zero-Sum Games". In: *2025 American Control Conference (ACC). 2025*, pp. 4903–4908. doi: **10.23919/ACC63710.2025.11107425**.
- [12] Sherif Ismail, **Ali Wadi**, Mamoun F. Abdel-Hafez, and Ala A. Hussein. "A Noise-Resilient Observer for Enhanced Surface Temperature Estimation of Li-ion Battery Cells". In: *IEEE Transactions on Transportation Electrification* (2024), pp. 1–1. doi: **10.1109/TTE.2024.3422208**.
- [13] **Ali Wadi**, Mamoun F. Abdel-Hafez, and Mohammad A. Jaradat. "Mitigating Motion Sickness in Autonomous Vehicles for Improved Passenger Comfort". In: *IEEE Access* 12 (2024), pp. 62709–62718. doi: **10.1109/ACCESS.2024.3386863**.

- [14] **Ali Wadi**, Wasim Al-Masri, Mamoun F. Abdel-Hafez, and Ala A. Hussein. "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**.
- [15] **Ali Wadi** and Shayok Mukhopadhyay. "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**.
- [16] **Ali Wadi**, Mamoun Abdel-Hafez, Hashim A. Hashim, and Ala A. Hussein. "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**.
- [17] Wasim Al-Masri, **Ali Wadi**, Mamoun F. Abdel-Hafez, Hashim A. Hashim, and Ayman H. El-Hag. "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**.
- [18] Mahroo Sajid, Ala A. Hussein, **Ali Wadi**, and Mamoun F. Abdel-Hafez. "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**.
- [19] Ishaq Hafez, **Ali Wadi**, Mamoun F. Abdel-Hafez, and Ala A. Hussein. "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**.
- [20] **Ali Wadi**, Mamoun Abdel-Hafez, and Ala A. Hussein. "Computationally Efficient State-of-Charge Estimation in Li-Ion Batteries Using Enhanced Dual-Kalman Filter". In: *Energies* 15.10 (2022). doi: **10.3390/en15103717**.
- [21] **Ali Wadi**, Shayok Mukhopadhyay, and Lotfi Romdhane. "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**.
- [22] 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**.
- [23] Ahmed M. Elsergany, Ala A. Hussein, **Ali Wadi**, and Mamoun F. Abdel-Hafez. "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**.
- [24] **Ali Wadi**, Mamoun F. Abdel-Hafez, and Ala A. Hussein. "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**.
- [25] Mahroo Sajid, **Ali Wadi**, Mamoun Abdel-Hafez, and Ala A. Hussein. "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**.
- [26] **Ali Wadi**, Mamoun Abdel-Hafez, Ala A. Hussein, and Fares Khawaja. "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**.
- [27] **Ali Wadi**, Mamoun Abdel-Hafez, Ghaleb A. Hussein, and Vinod Paul. "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**.
- [28] **Ali Wadi**, Mamoun F. Abdel-Hafez, and Ala A. Hussein. "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**.
- [29] **Ali Wadi**, Shayok Mukhopadhyay, and Jin Hyuk Lee. "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**.
- [30] **Ali Wadi**, Mamoun Abdel-Hafez, and Ghaleb A. Hussein. "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**.
- [31] **Ali Wadi**, Wasim Al-Masri, Wisal Siyam, Mamoun F. Abdel-Hafez, and Ayman H. El-Hag. "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**.
- [32] **Ali Wadi**, Jin Hyuk Lee, and Shayok Mukhopadhyay. "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**.
- [33] **Ali Wadi**, Jin Hyuk Lee, and Lotfi Romdhane. "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**.
- [34] **Ali Wadi**, Mamoun Abdel-Hafez, and Ghaleb A. Hussein. "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**.
- [35] **Ali Wadi**, Jin Hyuk Lee, and Lotfi Romdhane. "Dynamic Analysis of the Tilted Furuta Pendulum". In: *MATEC Web of Conferences*. Vol. 104. 2017. doi: **10.1051/mateconf/201710402011**.