

Dr. Mustafa Awwad Al-Khawaldeh, PhD

I am an Associate Professor in Mechatronics Engineering at Philadelphia University. I obtained my B.Sc. degree in Electro-mechanical Engineering in 1996 and MSc degree in Mechatronics Engineering in 2005 from the Al-Balqa' Applied University in Jordan. I have held several positions at Housing and Urban Development Cooperation in Jordan (1999-2009). I completed my PhD in Mechatronics Engineering at De Montfort University (United Kingdom) in 2014. I was the Chairman of the Department of Mechatronics Engineering at Philadelphia University in Jordan from 2020-2022. My research interests lie in the areas of Modelling and Simulation of Mechatronics Systems, Control, Fuzzy Logic, Neural Networks, Smart Homes, Ubiquitous Robotics and Internet of Things. I participated in different related conferences and have many publications in these fields.



Personal Information

Place and Date of Birth:	Jordan, Marsa', May 25, 1974
Work Address:	Philadelphia University, Faculty of Engineering and Technology. The Department of Mechatronics Engineering. Amman, Jordan P.O. Box 1, 19392
Website:	http://www.philadelphia.edu.jo/academics/malkhawaldeh
Email Address:	malkhawaldeh@philadelphia.edu.jo
ORCID:	https://orcid.org/my-orcid?orcid=0000-0002-5029-1403
Contact Number:	00962797095614

Research Interests

Ubiquitous Robotics

Smart Home Environment

Embedded Systems

Internet of Things (IoT)

Modelling, Simulation and Control of Mechatronics Systems.

Energy Management

Education

PhD, Mechatronics Engineering, De Montfort University, Mechatronics Research Centre Leicester, United Kingdom, 2014.

PhD Thesis title: Ubiquitous Robotics System for Knowledge-based Auto-configuration System for Service Delivery within Smart Home Environments.

M.Sc., Mechatronics Engineering, AL-Balqa Applied University, Amman, Jordan, August 2005, Very Good.

B.Sc., Mechatronics Engineering, AL-Balqa Applied University, Amman, Jordan, August 1996, Good.

Graduation Project Title: Feeding and Drilling Machine by Using Programmable Logic Controller (PLC).

Professional Experience

Chairman of Media Committee Faculty of Engineering and Technology, Philadelphia University, 2024-2025

Assistant professor (2014 – on going) Mechatronics Engineering Department, Philadelphia University

Chairman of the Mechatronics Engineering Department (2020-2022), Faculty of Engineering and Technology, Philadelphia University

Higher Education Quality Evaluator at The Accreditation and Quality Assurance Commission for Higher Education Institutions, 2021

Member of the University Council, (2019-2020) (2022-2023), Representatives for Faculty of Engineering and Technology, Philadelphia University

Member of the examination Committee of the graduation projects at the Faculty of Engineering at the University of Jordan, 2019-till now

Member of the Learning Outcomes Committee at the Jordanian Engineers Association

Chairman of the Field Training and Industry Outreach Committee (2019-2020)

Chairman of the Academic Guidance Committee at Faculty of Engineering and Technology, Philadelphia University 2023

Design Engineer, Electromechanical Systems (1997-1998.) Ministry of Public Works and Housing, Amman-Jordan.

Design Engineer, Electromechanical Systems (1999-2009.) Housing and Urban Development Cooperation, Amman-Jordan.

Head of Electro-Mechanical Engineering Department (2007-2009.) Housing and Urban Development Cooperation, Amman-Jordan.

Languages

Native Arabic

Professional English

Publications

Ismail Masalha, Ali Alahmer, Omar Badran, Mustafa Awwad Al-Khawaldeh, Siti Ujila Masuri, Hussein Maaitah. Proactive thermal management of photovoltaic systems using nanofluid cooling and advanced machine learning models, *Journal of Thermal Analysis and Calorimetry* 150 (21), 17529-17570, 2025

Ismail Al-Masalha, SU Masuri, OO Badran, Abdel Salam Salam Alsabagh, Aiman Al Alawin, Taiseer M Abu-Rahmeh, Mustafa A Al-Khawaldeh, Machine Learning Techniques Validation Using Experimental Average Surface Temperature and Output Power of Photovoltaic Panel Cooled by Porous Media Under Indoor Condition.

International Journal on Energy Conversion 13 (2), 2025

Mustafa Al-Khawaldeh, JA Ghaeb, SZ Salah, MS Alrawajfeh, (2024). High-performance speed control for three-phase induction motor based on reverse direction algorithm and artificial neural network, *International Journal of Electrical & Computer Engineering* 14(6): 2088-8708).

Samer As'ad, Sameh Alsaqoor, Mamdoh Al-Busoul, Mahmoud Abu-Zaid, Magdalena Joka-Yilidz, Gabriel Borowski and Mustafa Awwad Al-Khawaldeh (2023). Performance Comparison of Four-Stroke Diesel Engine Fuelled by Various Biodiesel Blends and Diesel, *Advances in Science and Technolog*, 17(4):46-52

Mohammad Mashagbeh, Mustafa AL-Khawaldeh, Sanad Hussein, Husam AlAbdellat, Andraws Swidan, (2023). A Low-Cost Robotic Arm Manipulator Model for Enhancing Student Learning in an Industrial Robots Course, 2023 IEEE Frontiers in Education Conference (FIE).

Beithou, N., Khalid, M. B., As'ad, S., Attar, H., Borowski, G., Al-Khawaldeh, M. A., & Alsaqoor, S. (2024). Microclimate Thermal Control for Open-Air Areas. *Ecological Engineering & Environmental Technology*, 25(5).

M A. Al-Khawaldeh, OM Al-Hababbeh, RT Al-Kasasbeh, RS Al-Adwan (2023). Mitigating the carbon footprint in Jordan by designing an artificial lake system to improve domestic tourism, *Results in Engineering* 20, 101579

A Al-Mahasneh, M Abu Mallouh, MA Al-Khawaldeh, B Jouda, O Shehata (2023). Online reinforcement learning control of robotic arm in presence of high variation in friction forces, Systems Science & Control Engineering 11 (1), 2251521

MA Mallouh, WS Araydah, B Jouda, MA Al-Khawaldeh(2023).Comparative Modeling Study of Pneumatic Artificial Muscle Using Neural Networks, ANFIS and Curve Fitting, 9th International Conference on Automation, Robotics and Applications.

TA Tutunji, M Al-Khawaldeh, M Alkayyali (2022).A three-stage PSO-based methodology for tuning an optimal PD-controller for robotic arm manipulators,Evolutionary Intelligence 15 (1), 381-396

Al-Mallah, M., Ali, M., & Al-Khawaldeh, M. (2022). Obstacles Avoidance for Mobile Robot Using Type-2 Fuzzy Logic Controller. Robotics, 11(6), 130

Al-Naimi, I. I., Ghaeb, J. A., Baniyounis, M. J., & Al-Khawaldeh, M. (2021). Fast detection technique for voltage unbalance in three-phase power system. International Journal of Power Electronics and Drive Systems (IJPEDS), 12(4), 2230-2242.

M. Al-Khawaldeh, I. Al-Naimi, X. Chen, and P. Moore, "Knowledge-based auto-configuration system using ubiquitous robotics for services delivery in smart home", International Journal of Embedded Systems, Inderscience, 11 (2), PP. 182-199, 2017.

Al-Habahbeh, O. M., Al-Adwan, R. S., & Al-Khawaldeh, M. A. (2022).Macro-engineering Design for an Artificial Lake in Southeastern Jordan, Wseas Transactions on Environment and Development, 18: 825-835

Tutunji, T. A., Al-Khawaldeh, M., & Alkayyali, M. (2022). A three-stage PSO-based methodology for tuning an optimal PD-controller for robotic arm manipulators. Evolutionary Intelligence, 15(1), 381-396.

Mustafa Al-Khawaldeh, (2019). General awareness of robot ethics: A case study of Jordanian Mechatronics engineering students,International Journal of Mechanical and Production Engineering,7(9):113-118

Mustafa Al-Khawaldeh, Nisreen Al-Khawaldeh, Baker Bani-Khair, Hussein Algwery, "Mechatronics Engineers' Perception of Code Mixing: Philadelphia University and Hashemite University as a Case Study", International Journal of Applied Linguistics and English Literature, Vol 5, No 7 (2016).

Osama M. Al-Habahbeh, Ahmad M, Jaber, Sami M. Halawani, Mustafa A. Al-Khawaldeh, "Performance-Weight Trade for Thermal Management Systems of Lithium-Ion Batteries", Jordan Journal of Electrical Engineering JJEE, Volume 4, Number 4, 2018, Pages 224-232.

Jasim A Ghaeb, Mustafa A Al-khawaldeh, Saleh Al-Jazzar, "Influence of Sampling Period on Harmonics of Three- Phase Space Vector Modulated Inverter" Current Journal of Applied Science and Technology, 17 Issue 5 Pages 1-8.

Osama M. Al-Habahbeh, Ismaeel H. Al-Abdullah, Dawod N. Al-Dweik, Mohammad A. Abu-Aqlah, Mustafa A. Al-Khawaldeh "Simulation-based Assessment of Quadrotor Linear Control Schemes ", International Journal of Recent Technology and Engineering, International Journal of Recent Technology and Engineering (IJRTE) 8(3): 3654-3662

Osama M. Al-Habahbeh, Maher Abu-Elola, Leema Rousan, Mustafa A. Al-Khawaldeh, (2019). "Boosting Aircraft Efficiency by Reversing the Load on the Horizontal Stabilizer" International Journal of Recent Technology and Engineering (IJRTE)8 (3):1-8

Conferences

Aynoor A. Al-Turk; Kasim M. Al-Aubidy; Mohammed Baniyounis; Mustafa Al-Khawaldeh (2025) AI-Based Real-Time Asthma Risk Prediction and Ventilator Control 2025 18th International Conference on Development in eSystem Engineering (DeSE) DOI: 10.1109/DeSE68208.2025,10-12 Nov. 2025

Mustafa Awwad Al-Khawaldeh, (2024) ANFIS based Mathematical Model of Mechanical Ventilator, International Conference on Development in eSystem Engineering (DeSE)

A. B. El-Fawair, K. M. Al-Aubidy and M. A. Al-Khawaldeh, (2024) ANFIS Based MPPT Controller for DC Motor Drives Supplied by PV Power System. ACCEPTED. 2024 21st International Multi-Conference on Systems, Signals & Devices (SSD)

A. B. El-Fawair, K. M. Al-Aubidy and M. A. Al-Khawaldeh, "Energy Management in Microgrids with Renewable Energy Sources and Energy Storage System," 2023 20th International Multi-Conference on Systems, Signals & Devices (SSD), Mahdia, Tunisia, 2023, pp. 801-806, doi: 10.1109/SSD58187.2023.10411198.

Mohammed Abu Mallouh, Walaa Sameer Araydah, Basel Jouha, Mustafa Al-Khawaldeh. Comparative Modeling study of Pneumatic Artificial Muscle Using Neural Networks, ANFIS and Curve Fitting, IEE International conference on automation, robotics, and applications (ICARA 2023)

M. Al-Khawaldeh, "General awareness of robot ethics: A case study of Jordanian mechatronics engineering students ISERD – International Conference on Recent Innovations in Engineering and Technology (ICRIET) London, UK 7th - 8th June, 2019.

The 2nd international conference on industrial system and manufacturing engineering (ISME' 19)-2019 Jordan Engineers Association and German Jordanian University/Attendance

M. Al-Khawaldeh, I. Al-Naimi, X. Chen, and P. Moore, "Ubiquitous robotics for knowledge-based auto-configuration system within smart home environment", 7th International Conference on Information and Communication Systems (ICICS), Irbid – Jordan, IEEE, 2016.

Professional Affiliations

Scientific committee (SCI)-SSD 2023

Organising Committee, The 2024 International Jordanian Cybersecurity Conference.

2nd Jordanian International Biomedical Engineering Conference

Jordan Engineers Association member since 1996.

Awards

A Certificate of Appreciation from the Association of Jordanian Engineers, Electrical Engineering Division

A Certificate of Honor, Philadelphia Knowledge Initiative, Philadelphia University, Scientific article, Enriching Arabic language Content on the Internet.

Courses Taught

MSc in Mechatronics Engineering.

Advanced Process Control

Advanced Mechatronic Systems Modelling and Simulation

B.Sc. in Mechatronics Engineering.

Modelling and Simulation

Digital Control

Transducers and Sensors

Dynamics

Mechatronics System Design

Signal Processing for Mechatronics

Engineering Skills

Laboratory Supervision - Instructor

Automatic Control Lab

Mechanical Vibration Lab

Programming lab

Master Thesis Defence Committee

Thesis Title: Wheelchair Neuro-Fuzzy Control Using Brain-Computer Interface, Mokhles M Abdulghani

Thesis Title: Cooperative Search and Rescue with Swarm of Robots Using Binary Dragonfly Algorithm, Lina Yazid Abu Omar

Thesis Title: ANFIS based MPPT controller for DC motor drives supplied by PV power system, Ansam El-Fawair

Thesis Title: Wireless Sensor Network Based Monitoring and Scheduling of Automated Factory, Mohammed Hazim AL-Obaidi

Thesis Title: Cooperative Search and Rescue with Swarm of Robots Using Binary Dragonfly Algorithm, Lina Yazid Abu Omar

Master Thesis Supervision

Obstacles Avoidance for Mobile Robot Using Type-2 Fuzzy Logic Controller, Al-Mallah, M.

Graduation Projects Supervision

Design and Implementation of an Automatic Lamb Milk Feeding System.

Automatic Line Follower Robot.

IOT Based Fire Fighting Robot.

Colour Sorting Machine Arduino Based.

IOT Based Multipurpose Agriculture Robot

IOT Based Flood Detection System

Training Courses and Workshops

Engineers Training Centre Courses/ Jordan Engineers Association

Electrical installation works 2000

Design of electrical installation works for buildings 1996

UPS systems and Application

Implementing Ethics and practicing of engineering career

3D AutoCAD (2007)

Uninterruptible power supply system and applications, 2000.

De Montfort University Training Courses During PhD

Literature searching and reference management

Research student induction event

Planning and managing research

Intellectual property rights and ethics

English language for academic research purpose

Writing skills

Create and manage large documents

Research methods technology

Beginning to teach in higher education, presenting your research to an audience, research ethics online training

Effective presentation, writing for publication, structuring and completing your thesis

Methods for raising awareness of the dangers of drugs- Anti-Narcotics department, 2017

Professional training course on universities ranking, Quality Assurance, scientific research methods (30 hours) Development and Training Centre, 2020