Yazan Mohammad AL-Rawashdeh

Systems, Mechatronics, Automation, Robotics, Control

Contact Information

Email Address:	y.alrawashdeh@psut.edu.jo
September 20, 2025 - Present (Assistant Professor)	Princess Sumaya University for Technology, Amman, Jordan Computer Engineering Department
July 20, 2025 - September 20, 2025 (Visiting Researcher)	**Guelph University**, 50 Stone Road East, Guelph ON N1G 2W1, Canada Mechatronics Engineering Department
September 1, 2024 - August 31, 2025 (Assistant Professor)	**Al-Zaytoonah University of Jordan**, 130 Amman 11733 Jordan Electrical Engineering Department Power and Control Program
February 2020 - April 25, 2024 (Post Doctoral Fellow)	**Memorial University of Newfoundland**, 230 Elizabeth Ave, St. John's, NL A1C 5S7 Mechanical Engineering Department **Topic**: Precision Motion Stages for Enhancing the Performance of Lithography in Semiconductor Manufacturing: Working on aspects of motion orchestration, task scheduling and prioritization. Also, developing optimal and robust trajectories utilizing input shaping, modeling and control, utilizing machine learning.
September 2018 - January 2020 (Adjunct Professor)	**University of Jordan**, Amman, Jordan Industrial Engineering Department

Academic Information

May 2018:	**King Fahd University of Petroleum and Minerals**, Dhahran, Saudi Arabia Ph.D. in Systems and Control Engineering GPA 3.844 out of 4.00 Ph.D. Thesis Title: Robust Behavioral Control of Multiagent Systems Developing a dynamical behavior-bank from which maritime, airborne, and ground robots over connected graphs can individually, competitively, or cooperatively select a behavior based on artificial intelligence, i.e., context-aware.
May 2014:	**King Fahd University of Petroleum and Minerals**, Dhahran, Saudi Arabia M.Sc. in Control and Instrumentation, Systems Engineering GPA 3.875 out of 4.00 M.Sc. Thesis Title: Improved Inertial Navigation System Using All-accelerometer Using a multitude of linear tri-axial accelerometers, the kinematics of linear and rotation motion of rigid bodies can be determined, along with estimates of the center of mass kinematics, and the gravitational field.
February 2006:	**University of Jordan**, Amman, Jordan Mechatronics Engineering Department B.Sc. in Mechatronics Engineering GPA 3.34 out of 4.00

US Patents

(**P1**): **Y. M. Al-Rawashdeh**, Moustafa Elshafei Ahmed Elshafei, and Mohammad Fahd Al-Malki, “Method and Apparatus for Estimation of Center of Gravity Using Accelerometers," US 9568320 B2, February **2017**.

(**P2**): Moustafa Elshafei Ahmed Elshafei, **Y. M. Al-Rawashdeh**, and Hassen Ouakad, “Inertial navigation system using all-accelerometer," US 15/940223, December **2019**.

(**P3**): **Y. M. Al-Rawashdeh**, Mohammad Al Janaideh, “Motion Trajectory Generation Using Embedded Input Shaping," Filed, August **2025**.

Journals (*Quartiles* **Q** according to **SJR**, *Impact Factor* **IF** upon publication)

Q1 IF (**J1**): **3.847** **Y. M. Al-Rawashdeh**, M. Elshafei, and M. Al-Malki, "In-Flight Estimation of Center of Gravity Position Using All-Accelerometers," Sensors, Vol. 14, no. 9, pp. 17567–17585, September. **2014**.

Q1 IF (**J2**): **4.347** S. El-Ferik, **Y. M. Al-Rawashdeh**, and F. L. Lewis, "A Framework of Multiagent Systems Behavioral Control Under State-Dependent Network Protocols," in IEEE Transactions on Control of Network Systems, vol. 7, no. 2, pp. 734-746, June **2020**.

Q1 IF (**J3**): **4.930** **Y. M. Al-Rawashdeh**, M. Al Janaideh, and M. Heertjes, "On characterization of a generic lithography machine in a multi-directional space," Mechanism and Machine Theory, vol. 170, pp. 104638, **2022**.

Q1 IF **(J4): 6.636** **Y. M. Al-Rawashdeh**, M. Al Janaideh and M. F. Heertjes, "Kinodynamic Generation of Wafer Scanners Trajectories Used in Semiconductor Manufacturing," in IEEE Transactions on Automation Science and Engineering, vol. 20, no. 1, pp. 718-732, January **2023**.

Q1 IF **(J5): 8.934** **Y. M. Al-Rawashdeh**, M. Al Janaideh, and M. Heertjes, "A suppress-excite approach for online trajectory generation of uncertain motion systems," Mechanical Systems and Signal Processing, vol. 186, pp. 109769, **2023**.

Q2 IF **(J6): 2.633** **Y. M. Al-Rawashdeh**, M. Elshafei, and H. Ouakad, "In-flight estimation of Quadrotor mass and Inertia using All-accelerometer," Journal of Vibration and Control. **2023** Jul 10:10775463231188355.

Q1 IF **(J7): 6.4** **Y. M. Al-Rawashdeh,** M. Al Saaideh, and M. Al Janaideh, "Piezoceramic Actuation for Precision Enhancement in a Multistage Industrial Motion System," in *IEEE/ASME Transactions on Mechatronics*, vol. 29, no. 6, pp. 4836-4842, Dec. 2024.

Q1 IF **(J8): 3.6** M. Pumphrey, M. Al Saaideh, **Y. M. Al-Rawashdeh**, N. Alatawneh, and M. Al Janaideh, "Force modeling of a reluctance motion system with multi-axial asymmetrical air gaps," Precision Engineering, 2023, DOI: 10.1016/j.precisioneng.2023.12.009.

Q1 IF **(J9): 5.2** M. Al-Solihat, M. Al Saaideh, **Y. M. Al-Rawashdeh**, M. Al Janaideh, "On Investigating Dynamic Coupling in Floating PLatform and Overhead Crane Interactions: Modeling and Control," *Nonlinear Dynamics* (2024): 1-17.

Q1 IF **(J10): 3.1** **Y. M. Al-Rawashdeh,** M. Al Saaideh, M. Heertjes, T. Oomen**,** and M. Al Janaideh, "Model-Free Control for an Industrial Long-stroke Motion System with a Nonlinear Micropositioning Actuator," *Mechatronics* 104 (2024): 103257.

Q1 IF **(J11): 6.4** **Y. M. Al-Rawashdeh**, M. F. Heertjes and M. Al Janaideh, "Point-to-Point Reference Trajectories Generation Using Frequency-Aware B-Splines/NURBS," in IEEE Transactions on Automation Science and Engineering, vol. 22, pp. 21325-21340, 2025.

Q2 IF **(J12): 2.5** M. Al Saaideh, **Y. M. Al-Rawashdeh,** K.Aljanaideh, A. Boker, and M. Al Janaideh, "Output Feedback Control of Variable-Loaded Four-joint Manipulators with Unknown Saturated Actuator Dynamics," *International Journal of Control, Automation and Systems* 22.12 (2024): 3694-3707.

Q1 IF **(J13): 4.3** M. Pumphrey, M. Al Saaideh, **Y. M. Al-Rawashdeh**, N. Alatawneh, K.F. Aljanaideh, A. Boker, and M. Al Janaideh, "A Koopman-based Digital Twin Approach for Fault Detection in Cable Slab Dynamics of Wafer Scanners," IEEE Sensors Journal, 2025.

Q1 IF **(J14): 3.1** M. Pumphrey, A. Boker, M. Al Saaideh, N. Alatawneh, **Y. M. Al-Rawashdeh**, K.F. Aljanaideh, and M. Al Janaideh, "Modeling and prediction of nonlinear cable slab dynamics using Koopman operators," *Mechatronics* 110 (2025): 103353.

Q1 IF **(J15): 5.9** M. Pumphrey, M. A. Saaideh, **Y. M. Al-Rawashdeh**, N. Alatawneh, B. Xu and M. A. Janaideh, "A Novel 2-DoF Reluctance Electromagnetic Precision Motion System: Design, Modeling, and Control," in IEEE Transactions on Instrumentation and Measurement, doi: 10.1109/TIM.2025.3615277. (**Early Access**)

Conferences (*H-Index* **HI**)

(**C1**): **Y. M. Al-Rawashdeh**, M. Elshafei, and S. El-Ferik, "Passive attitude estimation using gyroscopes and all-accelerometer IMU," 7th International Conference on Mechanical and Aerospace Engineering (**ICMAE**), London, **2016**, pp. 368-376.

(**C2**): **Y. M. Al-Rawashdeh** and M. Elshafei, "Filtering Techniques for Estimating the Angular Motion Using All-Accelerometers," Applied Mechanics and Materials, Vol. 829, **2016**, pp. 103-109.

(**C3**): **Y. M. Al-Rawashdeh**, M. F. Mysorewala and M. Elshafei, "In-flight alignment of distributed all-accelerometer network," IEEE Sensors Applications Symposium (**SAS**), Glassboro, NJ, **2017**, pp. 1-6.
HI 14

(**C4**): **Y. M. Al-Rawashdeh**, S. E. Ferik and M. A. Abido, "Robust Full-Car Active Suspension System," 10th International Conference on Information and Communication Systems (**ICICS**), Irbid, Jordan, **2019**, pp. 205-210

(**C5**): **Y. M. Al-Rawashdeh,** M. Al-Tamimi, M. Heertjes and M. Al Janaideh, "Micro-Positioning End-Stage for Precise Multi-Axis Motion Control in Optical Lithography Machines: Preliminary Results," American Control Conference (**ACC**), **2021**, pp. 40-47.
HI 116

(**C6**): **Y. M. Al-Rawashdeh,** M. Al Janaideh, and M. Heertjes, "On Synchronization of Generic Lithography Machine Open-chains using a Novel Fine-Positioning Stage System," Conference on Control Technology and Applications (**CCTA**), **2021**, pp. 1089-1094.
HI 9

(**C7**): **Y. M. Al-Rawashdeh,** M. Al Janaideh, and M. Heertjes, "On Step-And-Scan Trajectories Used in Wafer Scanners in Semiconductor Manufacturing," IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), **2021**, pp. 7580-7586 .
HI 128

(**C8**): **Y. M. Al-Rawashdeh,** M. Al Janaideh, and M. Heertjes, "Real-time Point-to-Point Motion Trajectories Generation for Uncertain Systems using Embedded Input Shaping: A Closed-Form Solution," American Control Conference (**ACC**), **2023**, pp. 698-703.
HI 116

(**C9**): **Y. M. Al-Rawashdeh,** V. Reddy, M. Al Saaideh, A. M. Boker, H. Eldardiry, and M. Al Janaideh, "Near-Optimal Trajectory Generation for Flexible Motion Systems using Two-Boundary Approach," 2023 European Control Conference (**ECC**), Bucharest, Romania, 2023, pp. 1-6
HI 14

(**C10**): **Y. M. Al-Rawashdeh**, M. Elshafei, and H. Ouakad, "Mass and inertia estimation using All-accelerometer," IEEE Sensors Applications Symposium (**SAS**), 2023, pp. 1-5.
HI 14

(**C11**): **Y. M. Al-Rawashdeh,** M. Al Janaideh, and M. Heertjes, "Motion Orchestration in Dual-Stage Wafer Scanners," 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), Detroit, MI, USA, 2023, pp. 8304-8309.
HI 139

(**C12**): **Y. M. Al-Rawashdeh,** M. Al Janaideh, and M. Heertjes, "Statistical Characterization of Position-Dependent Behavior using Frequency-Aware B-Spline," 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), Detroit, MI, USA, 2023, pp. 8270-8275.
HI 139

(**C13**): **Y. M. Al-Rawashdeh,** and M. Al Janaideh, "Cyber-attacks Detection and Mitigation Mechanism for Distributed Trajectory Generators," 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), Detroit, MI, USA, 2023, pp. 9205-9210.
HI 139

(**C14**): **Y. M. Al-Rawashdeh,** M. Al Saaideh, and M. Al Janaideh, "Using Piezoceramic-Actuated Stages in Precision Long-Stroke Motion Systems: A Design Procedure," 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), Detroit, MI, USA, 2023, pp. 2659-2664.
HI 139

(**C15**): **Y. M. Al-Rawashdeh**, M. Al Saaideh, A. M. Boker, H. Eldardiry, M. F. Heertjes and M. Al Janaideh, "Trajectory Generation Using Activator-Inhibitor Systems," 2023 62nd IEEE Conference on Decision and Control (**CDC**), Singapore, Singapore, 2023, pp. 8857-8863.
HI 134

(**C16**): **Y. M. Al-Rawashdeh,** M. Al Janaideh, and M. Heertjes, "Time-Aware NURBS," 2024 American Control Conference (**ACC**), pp. 5244-5249.
HI 116

(**C17**): **Y. M. Al-Rawashdeh,** M. Al Saaideh, M. Heertjes, and M. Al Janaideh, "On Precision Motion Control for an Industrial Long-Stroke Motion System with Nonlinear Micropositioning Actuator," 2024 American Control Conference (**ACC**), pp. 4120-4125.
HI 116

(**C18**): M. Al Saaideh, M. Al-Solihat, **Y. M. Al-Rawashdeh,** K. Al Janaideh, and M. Al Janaideh, "Decoupling and Tracking Control of Offshore Crane System Effect by Unknown Roll/Heave Wave Motions Disturbances," 2024 American Control Conference (**ACC**), pp. 2134-2139.
HI 116

(**C19**): **Y. M. Al-Rawashdeh,** M. Al Saaideh, M. Heertjes, and M. Al Janaideh, "Model-Free Control of a Class of High-Precision Scanning Motion Systems with Piezoceramic Actuators," 2024 IEEE International Conference on Robotics and Automation (**ICRA**), pp. 3520-3525.
HI 207

(**C20**): **Y. M. Al-Rawashdeh,** M. Al Saaideh, M. Pumphrey, N. Alatawneh, and M. Al Janaideh, "Data-Driven Cable Slab Modeling using Neural Networks," 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), pp. 2286-2291.
HI 139

(**C21**): M. Al Saaideh, **Y. M. Al-Rawashdeh,** K. Al Janaideh, N. Alatawneh, and M. Al Janaideh, "Position Control of a Low-Energy C-Core Reluctance Actuator in a Motion System," 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), pp. 740-745.
HI 139

(**C22**): M. Al Saaideh, **Y. M. Al-Rawashdeh**, N. Alatawneh, A. M. Boker, and M. Al Janaideh, "Development of a Current-Position Control Strategy for Motion Systems Utilizing Nonlinear Reluctance Actuators," 2024 63rd IEEE Conference on Decision and Control (**CDC**), pp. 2043-2048.
HI 134

(**C23**): **Y. M. Al-Rawashdeh,** M. Al Saaideh, M. Pumphrey, N. Alatawneh, and M. Al Janaideh, "Vision-Based Estimation of Cable Slab Forces in Precision Motion Applications," 2024 63rd IEEE Conference on Decision and Control (**CDC**), pp. 2049-2055.
HI 134

(**C24**): M. Pumphrey et al., "Koopman Operator-Based Modeling of Cable Slab Nonlinear Dynamics," 2025 American Control Conference (**ACC**), Denver, CO, USA, 2025, pp. 3920-3925
HI 116

HI

(**C25**): M. A. Saaideh, A. Boker, N. Alatawaneh, Y. Al-Rawashdeh, L. Zhang and M. A. Janaideh, "Output Feedback Decoupling Control of Deformable Mirrors for Adaptive Optics Applications," 2025 American Control Conference (**ACC**), Denver, CO, USA, 2025, pp. 3940-3945

116

(**C26**): M. Pumphrey, A. Boker, M. Al Saaideh, N. Alatawneh, **Y. M. Al-Rawashdeh**, K.F. Aljanaideh, and M. Al Janaideh, "Modeling and Prediction of Nonlinear Cable Slab Dynamics using Koopman Operators," Joint 10th **IFAC** Symposium on Mechatronic Systems and 14th Symposium on Robotics. ***Accepted***.

(**C27**): S. O. Al-Jazzar, **Y. M. Al-Rawashdeh**, "3D Location Estimation and Tracking Utilizing Hybrid Extended KALMAN Filter for AOA Only Measurements," International Conference on Smart Applications, Communications and Networking (SmartNets) 2025 Jul 22 (pp. 1-4). IEEE.

Teaching

IE096542	Automation	University of Jordan	Fall 2018
ME7205	Mechatronics II	Memorial University of Newfoundland	Spring 2023
0905549	Programmable Logic Controllers (PLC)	Al-Zaytoonah University of Jordan	Fall 2024
0909242	Digital Logic Design		Fall 2024, Spring 2024
0905342	Control Systems		Fall 2024, Spring 2024
22241	Digital Logic Design	Princess Sumaya University for Technology	Fall 2025
22582-22583	Introduction to Robotic Systems		

Scholarships

(S1)	At the expense of the Royal High (for the children of the military) Jordan The University of Jordan B.Sc. in Mechatronics Engineering	2001-2006
(S2)	Ministry of Higher Education in the Kingdom of Saudi Arabia King Fahd University of Petroleum and Minerals. M.Sc. in Systems Engineering	2012-2014
(S3)	Ministry of Higher Education in the Kingdom of Saudi Arabia. King Fahd University of Petroleum and Minerals. Ph.D. in Systems and Control Engineering.	2014-2018

Industrial Collaborations

ASML Dr. Marcel Heertjes **Eindhoven University of Technology** Mechanical Engineering Department 2021 – Present	Working on aspects of motion orchestration, task scheduling and prioritization. Also, developing optimal and robust trajectories utilizing input shaping, modeling and control, utilizing machine learning.
ASML Dr. Natheer Alatawneh May 2023 – Present	Working on developing fractures prediction models of cable slabs under extremely high acceleration profiles.

Academic Collaborations

Virginia Polytechnic Institute and State University Department of Computer Science Dr. Hoda Eldardiry Bradley Department of Electrical and Computer Engineering Dr. Almuatazbellah Boker	Working on aspects including machine learning, data-driven control, optimal two-boundary trajectory generation, and high-gain state observers.

June 2022 – Present

Work Experience

June 2018-January 2020: August 2010-September 2012:	**Automation Engineer** Self-employed. CNC, PLC, SCADA, Control Panels, Instrumentation, Pneumatic and Hydraulic systems.
August 2009-August 2010:	**Teaching Assistant** University of Jordan Amman, Jordan Mechatronics Engineering Department.
April 2008 – August 2009:	**Engineer** Institute of Applied Technology IAT Al Ain, UAE Engineering Labs
September 2006 – April 2008:	**Engineer** University of Jordan Amman, Jordan Mechatronics Engineering Department.

Professional Courses

Institution: Part of: Platform:	**Massachusetts Institute of Technology (MIT)** MicroMasters® Program in Principles of Manufacturing edX
Manufacturing Process Control I:	Learn how to model variations in manufacturing processes and develop methods to reduce and control deterministic variations to achieve consistent process quality.
Manufacturing Process Control II:	Learn how to control process variation, including methods to design experiments that capture process behavior and understand means to control variability.
Supply Chains for Manufacturing: Inventory Analytics	Learn about effective supply chain strategies for companies that operate globally, with emphasis on how to plan and integrate supply chain components into a coordinated system.
Supply Chains for Manufacturing: Capacity Analytics	Learn about various models, methods and software tools to help make better decisions for system design in manufacturing systems and supply chains.. *This course was formerly known as Supply Chains for Manufacturing II.*
Manufacturing Systems I:	Learn about manufacturing systems and ways to analyze them in terms of material flow and storage, information flow, capacities, and times and durations of events, especially random events.
Fundamentals of Manufacturing Processes	Study the processes used to manufacture products ranging from toys to smartphones, and learn fundamental principles and practical considerations that enable production at scale.

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