Ammar Yacoub

PhD Candidate · Mechanical Engineering

Southern Methodist University, Dallas, TX

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Education

Southern Methodist University (SMU) *Texas, USA*

Ph.D. in Mechanical Engineering (Control and Dynamics) *Expected May 2027*

- Dissertation title: Developing a Haptic-Enabled Virtual Palpation System for 3D Elastography Medical Imaging
- Advisor: Prof. Yildirim Hurmuzlu
- GPA: 4.0/4.0

Jordan University of Science and Technology *Irbid, Jordan*

M.S. in Mechanical/Mechatronics Engineering *2019 – 2022*

- Thesis title: Bearing Fault Diagnostic using Transient Extraction Transform and Convolutional Neural Network
- Advisor: Dr. Ahmad Al-Shorman
- GPA: 4.26/4.3

University of Jordan *Amman, Jordan*

B.S. in Mechatronics Engineering *2013 – 2017*

- Graduation project: Simulation of Flux Vector Control for a Squirrel Cage Induction Motor Using the d-q State Modeling
- Advisor: Prof. Lutfi Al-Sharif
- GPA: 3.91/4.0

Academic Experience

Systems Laboratory, Southern Methodist University *Texas, USA*

Graduate Research Assistant *Sep 2023 – Present*

- Developing a Haptic-Enabled Virtual Palpation System for 3D Elastography Medical Imaging.
- Performing comprehensive kinematic and dynamic analysis of a pneumatically actuated haptic glove.
- Implementing non-linear control strategies for pneumatic cylinders to enhance force-tracking performance.
- Conducted research on the design and magnetic actuation of small-scale bipedal robots.

Department of Mechanical Engineering, Southern Methodist University *Texas, USA*

Graduate Teaching Assistant *Sep 2023 – Present*

- Developing and refining the curriculum and experimental modules for the undergraduate Dynamics and Control Systems laboratory.
- Instructing undergraduate students in hands-on Control and Measurement laboratory sessions.
- Evaluating assignments, exams, and providing constructive feedback for core engineering courses including Statics, Dynamics, Mechatronics, and Control Systems.

Eureka Tech Academy *Amman, Jordan*

Lecturer (Part-Time) *2018 – 2020*

- Instructed youth students in foundational STEM concepts, including electronics, Arduino programming, IoT (NodeMCU), and robotics.
- Designed and developed comprehensive, age-appropriate curricula for electronics and microcontroller programming.

Department of Mechatronics Engineering, University of Jordan *Amman, Jordan*

Undergraduate Research Assistant *2016 – 2017*

- Collaborated with Prof. Lutfi Al-Sharif on traffic elevator systems research.
- Conducted advanced analysis on Sectoring Control Systems utilizing Monte Carlo simulations.

TadressJo *Amman, Jordan*

Academic Tutor (Engineering) *2014 – 2019*

- Provided foundational instruction and one-on-one mentorship to undergraduate students in core electrical and mechatronics engineering courses.

Publications

Note: Publications prior to 2021 appear under the name A. Hakam; subsequent publications are under A. Yacoub.

Published

Yacoub, A., Richer, E., & Hurmuzlu, Y. (2025). Comparative Analysis of Fingertip Location for the SMU Haptic Glove by Opti-Track Cameras and Embedded Position Sensors. IFAC-PapersOnLine, 59(30), 203-208.

Cox, A., Asadi, F., **Yacoub, A.**, Beskok, S., & Hurmuzlu, Y. (2025). Magnetically actuated millimeter-scale biped. Robotics and Autonomous Systems, 190, 104985.

Al-Sharif, L., Yang, Z. S., **Hakam, A**., & Abd Al-Raheem, A. (2018). Comprehensive analysis of elevator static sectoring control systems using Monte Carlo simulation. Building Services Engineering Research and Technology, 39(5), 518-539.

Al-Sharif, L., Toghoj, N., & **Hakam, A**. (2020, September). Using the inter-linked monte carlo simulation method (iL-MCS) to calculate the value of the elevator round trip time to reflect the random nature of passenger destinations. In 11th Symposium on Lift and Escalator Technologies (Vol. 11, No. 1, pp. 173-184).

Accepted

Yacoub, A., Richer, E., & Hurmuzlu, Y. (2026). Static Friction Modeling and Compensation for Improved Force Tracking in Pneumatic Cylinders using Sliding Mode Control. American Control Conference (ACC).

In Review

Yacoub, A., Richer, E., & Hurmuzlu, Y. (2026). Design and Kinematics Analysis for the SMU Haptic Glove. Mechanism and Machine Theory

Yacoub, A., Hurmuzlu, Y, & Richer, E. (2026). Modeling and Compensation of Static Friction to Improve Force Tracking Performance in Miniature Pneumatic Cylinders. IEEE Transactions on Control Systems Technology.

Yacoub, A., Richer, E., & Hurmuzlu, Y. (2026). Adaptive Robust Sliding Mode Control with Friction Compensation for Force Tracking of a Small Pneumatic Cylinder. IEEE Conference on Decision and Control (CDC).

Awards, Fellowships, & Grants

2026	**Travel Grant**, American Control Conference	*$600*
2025	**Graduate Student Travel Grant**, Moody School of Graduate and Advanced Studies	*$700*
	Travel Grant, Modeling, Estimation and Control Conference	*$400*
2022	**Second Place Award, Graduate Research Day, Poster Competition**, Jordan University of Science and Technology	*$400*

Industrial Experience

Teeba Investment for Developed Food Processing (IDJ: Almarai & PepsiCo) *Al-Hallabat, Jordan*

Automation Engineer (Supervisor Level) *2019 – 2023*

- Diagnosed and resolved complex Programmable Logic Controller (PLC) issues to minimize production machinery downtime.
- Troubleshot and maintained SCADA systems, ensuring continuous and reliable plant operations.
- Addressed network and communication faults between industrial machines and the central control room.
- Drafted technical specifications and documentation for automation components, including servo motors, sensors, and transmitters.
- Developed and implemented preventive maintenance plans while effectively managing the electrical spare parts inventory.
- Generated comprehensive technical reports and maintenance checklists, and directed the resolution of major electrical faults.

Teeba Investment for Developed Food Processing (IDJ: Almarai & PepsiCo) *Al-Hallabat, Jordan*

Electrical Engineer *2018 – 2019*

- Conducted industrial electrical installations and performed routine maintenance across the processing plant.
- Executed comprehensive preventive maintenance plans for various electrical systems.
- Performed regular diagnostic checks and testing on critical electrical equipment to ensure safety and operational efficiency.

Technical Skills

Programming: MATLAB, Mathematica, LabVIEW, C++, Python

CAD & Modeling: SOLIDWORKS

Embedded Hardware: NI cRIO, NI sbRIO (9636, 9638), Arduino, NI DAQ, ESP8266, ESP32

Systems Engineering: System Integration, Sensor & Actuator Selection, Electromechanical Interfacing, Control Algorithms

Professional Memberships

Graduate Student Member, IEEE Control Systems Society	2025 – Present
Graduate Student Member, IEEE Robotics & Automation Society	2025 – Present
Student Member, The American Society of Mechanical Engineers (ASME)	2025 – Present

References

Prof. Yildirim Hurmuzlu (Ph.D. Advisor) *Southern Methodist University*

University Distinguished Professor, Department of Mechanical Engineering

- Email: hurmuzlu@smu.edu

Dr. Edmond Richer *Southern Methodist University*

Associate Chair of Graduate Studies and Research, Department of Mechanical Engineering

- Email: richer@lyle.smu.edu

Dr. Ahmad Al-Shorman (M.S. Thesis Advisor) *Texas A&M International University*

Visiting Assistant Professor, Department of Mechanical Engineering

- Email: ahmad.alshorman@tamiu.edu