Mahmoud A. Hayajnh

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RESEARCH INTERESTS

- Flight Mechanics and Control
- Rotorcraft System Identification

EDUCATION

Ph.D., Aerospace Engineering (February 2025)
Georgia Institute of Technology, Atlanta, GA
GPA: 3.88/4.00

M.Sc., Aerospace Engineering (August 2019)
Georgia Institute of Technology, Atlanta, GA
GPA: 3.88/4.00

B.Sc., Aeronautical Engineering (June 2016)
Jordan University of Science and Technology, Irbid, Jordan
GPA: 87.5%
Ranked first in my class.

RELEVANT COURSE WORK

- Controls: Linear and Nonlinear Control, Robust Control, Optimal Guidance and Control, Kalman Filtering
- Flight Dynamics and Control: Helicopter Stability and Control, Advanced Flight Dynamics
- Dynamics: Rotorcraft Dynamics, Advanced Dynamics
- Mathematics: Random Processes, Computational Fluency (Numerical Analysis and Algorithms)
- Other: Optimization for the Design of Engineered Systems, Mathematical Principles of Planning and Decision-Making for Autonomy

EXPERIENCE

- February 2025 – Present: Assistant Professor, Jordan University of Science and Technology, Irbid, Jordan
- June 2021 – February 2025: Graduate Research Assistant, Guggenheim School of Aerospace Engineering, Atlanta, GA
  - Currently working under the Vertical Lift Research Center of Excellence (VLRCOE) on the topic of control equivalent turbulence input models for rotors.
- August 2018 – May 2021: Graduate Teaching Assistant, Guggenheim School of Aerospace Engineering, Atlanta, GA:
  - AE4610: Dynamics and Control Laboratory
  - AE3531: Control Systems Analysis and Design
  - AE4701: Wind Engineering

- June 2016 – August 2017: Research Engineer, MARS Robotics, Irbid, Jordan:
  - Specialized in autopilot design using MATLAB/Simulink.
  - Modeling experience includes: linear and nonlinear control; fuzzy logic control; digital signal processing; navigation; surface calibration; area waypoints; failsafe modes
  - Involved with system design, analysis and implementation for several gimbals and quadcopters
  - Hands-on experience with the integration of small fixed wing aircraft and quadcopters
  - Engineering 3D drawing using Pro-Engineer and printing using the Ultimaker 3D-printers
- February 2016 – May 2016: Aeronautical Engineer Trainee, Jordan Aircraft Maintenance Limited, Amman, Jordan:
  - Experience with treatment of composite materials, metal sheets and testing using non-destructive tests
  - Experience with maintenance of flight avionics
  - Familiarity with maintenance procedures and compliance with aviation regulations
  - Hands-on experience with maintenance of currently operational aircrafts

AWARDS

- Awarded a full scholarship from the Jordan University of Science and Technology for my Graduate Studies in the US (2017).
- Awarded a full scholarship from the Ministry of Education of Jordan for my Undergraduate Studies in Jordan (2011 – 2016)

HONORS

- Graduated top of class, Aeronautical Engineering Department, Jordan University of Science and Technology, Irbid, Jordan (2016)

ASSOCIATION MEMBERSHIPS

- Member of the American Institute of Aeronautics and Astronautics (AIAA)
- Member of the Vertical Flight Society (VFS)
- Member of the Jordanian Engineers Association (JEA)

PUBLICATIONS

Journal Papers:

J1) **Hayajnh, M.A.**, Prasad, J.V.R. "The Application of Rotor Control Equivalent Turbulence Input (RCETI) Models to Multi-Rotor Vehicles.", *Aerospace 2024*, 11, 896.

J2) **Hayajnh, M.A.**, Saetti, U., Prasad, J.V.R. "Identification of High-Order Linear Time-Invariant Models from Periodic Nonlinear System Responses.", *Aerospace 2024*, 11, 875.

Conference Papers:

C1) Sinha, T., **Hayajnh, M. A.**, Prasad, J.V.R. "Development of Rotor Control Equivalent Gust Input (RCEGI) Models", *Proceedings of the Vertical Flight Society's 81st Annual Forum*, Virginia Beach, VA, May 20-22, 2025.

C2) **Hayajnh, M. A.**, Prasad, J.V.R. "Parametric Rotor Control Equivalent Turbulence Input (RCETI) Models for Different Rotor Configurations", *Proceedings of the Vertical Flight Society's 80th Annual Forum*, Montreal, Quebec, Canada, May 7-9, 2024.

C3) **Hayajnh, M. A.**, Prasad, J.V.R. "Rotor Control Equivalent Turbulence Input (RCETI) Models for Multi-Rotor Vehicles", *Proceedings of the 49th European Rotorcraft Forum*, Buckeberg, Germany, Sep 5-7 2023.

C4) **Hayajnh, M. A.**, Prasad, J.V.R. "Development of a Parametric Rotor Control Equivalent Turbulence Input (RCETI) Models", *Proceedings of the Vertical Flight Society's 79th Annual Forum*, West Palm Beach, Florida, May 16-18, 2023.

C5) **Hayajnh, M. A.**, Prasad, J.V.R. "Generalized Rotor Control Equivalent Turbulence Input (RCETI) Models", *Proceedings of the 2023 AIAA SciTech Forum*, National Harbor, Maryland, Jan 23-27, 2023.

C6) **Hayajnh, M. A.**, Prasad, J.V.R. "Rotor Control Equivalent Turbulence Input (RCETI) Models", *Proceedings of the 48th European Rotorcraft Forum*, Winterthur, Switzerland, Sep 6-8, 2022.

C7) Walters, R., **Hayajnh, M. A.**, Feigh, K. M., Prasad, J.V.R. "3D Conformal Pilot Cueing for Rotorcraft Shipboard Landings: On-Demand Trajectory Generation used with a Flight Path Marker Cue", *Proceedings of the Vertical Flight Society's 78th Annual Forum*, Ft. Worth, Texas, May 10-12, 2022.

C8) **Hayajnh, M. A.**, Saetti U., Prasad, J.V.R. "Identification of High-Order Linear Time-Invariant Models from Periodic Nonlinear System Responses", *Proceedings of the Vertical Flight Society's 9th Annual Electric VTOL Symposium*, San Jose, California, Jan 25-27, 2022.

SKILLS

- Software: MATLAB, Simulink, C++ Programming, CIFER, FLIGHTLAB, Mathematica, LaTeX, Fluent ANSYS, Pro-Engineer, XFLR.