Ahmad Al-Tawaha

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Summary

I am a fifth-year Ph.D. candidate developing **temporally robust learning, optimization, and control algorithms** that remain reliable under non-stationarity and temporal drift. My research bridges **distributed optimization, system identification, and control**, focusing on decision-making systems that stay stable, safe, and efficient from semidefinite optimization in power systems to trajectory planning and guidance in complex dynamical environments.

Education

Virginia Polytechnic Institute and State University (Virginia Tech) *Blacksburg, VA*

Ph.D. Electrical and Computer Engineering *August 2021 - May 2026*

- Advisor: ***Dr. Ming Jin***

Jordan University of Science and Technology *Irbid, Jordan*

MS Mechanical Engineering–Mechatronics *August 2018 - May 2021*

- Thesis: Model Order Determination with Applications in System Identification, Image and Signal Processing
- Advisor: ***Dr. Khaled F. Aljanaideh***
- GPA: 4.2/4.4

Jordan University of Science and Technology *Irbid, Jordan*

B.Tech Aeronautical Engineering *August 2012 - November 2016*

- GPA: 86.7%
- Graduated top of class out of 40 students (1/40)

Academic Experience

Electrical and Computer Engineering Department, Virginia Tech *Blacksburg, Virginia*

Graduate Research Assistant *August 2021 - Now*

- Mentors: Ming Jin
- Developing temporally robust learning, optimization, and control algorithms resilient to non-stationarity from distributed optimization to agentic AI.

Publications

Journal Publications

Al-Tawaha, Ahmad., Cibaku, Elson., Park, SangWoo., Lavaei, Javad., Jin, Ming.,"Distributed Optimization and Learning: A Paradigm Shift for Power Systems", ***IEEE Systems Journal***, **accepted, 2025**.

Al-Tawaha, Ahmad., A. Alshorman, K. F. Aljanaideh "A Nonheuristic Singular Value Thresholding Algorithm for Order Estimation ", ***Journal of Dynamic Systems, Measurement, and Control***, **accepted, 2025**.

Conference and Workshop Publications

Al-Tawaha, Ahmad., Lavaei, Javad., Jin, Ming., "A Dynamic Penalization Framework for Online Rank-1 Semidefinite Programming Relaxations." Learning for Dynamics & Control Conference, **(L4DC 2025)** .

Sel, B., **Al-Tawaha, Ahmad.**, Khattar, V., Jia, R. and Jin, M., "Algorithm of thoughts: Enhancing exploration of ideas in large language models". **(ICML 2024)** .

Al-Tawaha, Ahmad.*, Zain Ul-Abdeen*, Padmaksha Roy*, Rouxi Jia, Laura Freeman, Peter Beling, Chen-Ching Liu, Alberto Sangiovanni-Vincentelli, and Ming Jin, "Defense against Joint Poison and Evasion Attacks: A Case Study of DERMS," **(AAAI 2025 Workshop Paper)**.

Al-Tawaha, Ahmad., K. F. Aljanaideh, and A. Alshorman, "An Analytical Approach to Signal Denoising Based on Singular Value Decomposition," **(ACC 2025)**.

Mohammad, Ramadan, **Al-Tawaha, Ahmad.**, Mohamed Shouman, Ahmed Atallah, and Ming Jin, "Monte Carlo Grid Dynamic Programming: Almost Sure Convergence and Probability Constraints," **(ACC 2025)**.

Al-Tawaha, Ahmad, and Ming Jin, "Does Online Gradient Descent (and Variants) Still Work with Biased Gradient and Variance?," **(ACC 2024)**.

B. Sel, **Al-Tawaha, Ahmad.**, Y. Ding, R. Jia, B. Ji, J. Lavaei, and M. Jin, "Learning-to-Learn to Guide Random Search: Derivative-Free Meta Blackbox Optimization on Manifold," **(L4DC 2023)**.

Al-Tawaha, Ahmad., H. Kaushik, B. Sel, R. Jia, and M. Jin, "Decision-Focused Learning for Inverse Noncooperative Games: Generalization Bounds and Convergence Analysis," **(IFAC World Congress 2023)**.

Al-Tawaha, Ahmad., K. F. Aljanaideh, and A. Alshorman, "A Singular Value Thresholding Algorithm for Order Estimation," **(ACC 2023)**.

Al-Tawaha, Ahmad., Jin, Ming., Khaled F. Aljanaideh, "Finite-Time Identification of LTI Systems Using Non-Causal FIR Models: A Unified Framework for Stable and Unstable Systems", **submitted**.

Technical Skills

Programming languages. Python, Matlab and Simulink, C++, HTML, Mathematica, ANSYS, Pro-Engineer, LaTeX.

Frameworks. PyTorch ,TensorFlow, CVX, CVXPY, Cvxpylayer, Gurobi, Tensorflow, NumPy, Pandas, Scikit-learn, OpenAI Playground, experience with HPC

Awards & Scholarships

2024 **ACC 2024 travel scholarship**,

2012–2018. **Awarded a full scholarship from the Ministry of Education of Jordan for my B.Sc. and M.Sc. studies in Jordan**,

Outreach and Service

Conference reviewer: *1)* ICLR 2025; *2)* ACC 2024, 2025, 2026; *3)* CDC 2025; *4)* IFAC 2023, 2025; *5)* IEEE Transactions on Control of Network Systems

Tutorials: Distributed Control Strategies for Resilient Power Grids at SmartGridComm 2024 conference.