Ahmad Ghasemi

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Summary

- **Research Focus:** Cybersecurity and trustworthy ML for networked autonomous and cyber-physical systems (UAV/IoT), focusing on adversarial machine learning, robust learning-and-control, and secure wireless/edge systems under latency–energy–reliability constraints.
- **Grant:** **Co-PI**, NSF CPS Small **AERIAL**.
- **Proposals:** **PI**, NSF SBIR Phase I (submitted, Nov. 2025); **Senior Personnel**, NSF RET Site (submitted, Oct. 2025).
- **Awards:** **1.** WOCC Best Paper Award, **2.** WPI Travel Award.
- **Selected Publication:** First-author papers in **IEEE TWC** and **IEEE TVT** on wireless systems and adversarial robustness; **WOCC Best Paper Award** (2020).
- **Teaching:** Instructor/co-instructor (UG/Grad) in ML, generative models, DSP, image processing, and data science; created and launched new graduate courses; instructor effectiveness **4.7/5.0** (UMass).
- **Mentoring & service:** Mentored/co-mentored PhD/MS/UG researchers; reviewer for ICLR and IEEE journals; curriculum committee member (UMass **iCons**).
- **Work Authorization:** Lawful Permanent Resident (Green Card Holder via National Interest Waiver).

Education

Ph.D., Data Science, Worcester Polytechnic Institute (WPI), Worcester, MA, USA **2023**
Dissertation: intelligent and resilient resource allocation in mmWave wireless communications
Advisor: Reza Zekavat

M.Sc., Electrical and Computer Engineering, Shiraz University, Shiraz, Iran **2012**
Dissertation: machine learning-based spectrum allocation in cognitive radio networks
Advisors: Mohammad Ali Masnadi-Shirazi; Mehrzad Biguesh

B.S., Electrical and Computer Engineering,, University of Sistan and Baluchestan, Zahedan, Iran **2007**

Professional/Research Appointments

Postdoctoral Research Fellow, University of Massachusetts, Amherst, MA **05/2024 - Present**
Supervisor: Hossein Pishro-Nik.
Focus: Cybersecurity and trustworthy/budget-aware ML for networked autonomy and wireless CPS.

Adjunct Faculty, University of Massachusetts, Amherst, MA **09/2023 - Present**

Lecturer, Electrical and Computer Engineering, Payame Noor University, Bandar Abbas, Iran **2013 - 2017**

Lecturer, Electrical and Computer Engineering, Azad University, Bandar Abbas, Iran **2013 - 2017**

Honors and Awards

Travel Award, School of Arts & Sciences, WPI, Worcester, MA, USA **2022**
Nominated, TA of the Year Award, WPI, Worcester, MA, USA **2022**
Charles Kao Best Paper Award, the 29th Wireless and Optical Communications Conference, NJ, USA **2020**

Research Funding

Active **NSF CPS Small (Co-PI)**, AERIAL: AI-Embedded Responsive Intelligent Agents with Trajectory-Induced Digital Twin Learning, (CNS-2528914; $599,961; 08/2025–07/2028). *PI:* H. Pishro-Nik. *My role: Thrust 2 Lead* on (i) trustworthy and budget-aware learning-and-control for autonomous agents, (ii) digital-twin validation protocols for security/robustness testing, and (iii) assurance metrics and evaluation harnesses (latency/energy/reliability) for UAV-facing experiments.

In Review **NSF SBIR Phase I (PI)**, GRIT: Guided Reasoning Intelligence for Trustworthy STEM Learning, $302,148. *Submitted:* Nov. 2025.

In Review **NSF RET Site (Senior Personnel)**, Probabilistic Decision Making and AI in STEM, $585,892. *PI:* H. Pishro-Nik. *Submitted:* Oct. 2025.

Publications

* indicates co-first author.

Book

[B1] F. Ghasemi, **A. Ghasemi**, "Numerical Methods: Basics and coding in MATLAB," Zolal-e-Sabz Press, 2020.

Journal Papers

[J1] M. Malekzadeh*, **A. Ghasemi***, and H. Pishro-Nik, "Robust UAV Trajectory Design for Non-Uniform Coverage," IEEE Communications Letters, vol. 30, pp. 188-192, 2026.

[J2] **A. Ghasemi**, E. Zeraatkar, M. Moradikia, and R. Zekavat, "Adversarial Attacks on Graph Neural Networks-Based Spatial Resource Management in P2P Wireless Communications," *IEEE Transactions on Vehicular Technology*, vol. 73, no. 6, pp. 8847–8863, June 2024.

[J3] **A. Ghasemi** and S. A. Zekavat, "Low-Cost mmWave MIMO Multi-Streaming via Bi-Clustering, Graph Coloring, and Hybrid Beamforming," *IEEE Transactions on Wireless Communications*, vol. 20, no. 7, pp. 4113–4127, July 2021.

[J4] **A. Ghasemi**, M. Masnadi-Shirazi, M. Biguesh, and F. Qassemi, "Channel Assignment Based on Bee Algorithms in Multi-hop Cognitive Radio Networks," *IET Communications*, 8(13), 2356–2365, 2014.

[J5] R. Zekavat, R. M. Buehrer, G. D. Durgin, L. Lovisolo, Z. Wang, T. Goh, and **A. Ghasemi**, "An Overview on Position Location: Past, Present, Future," *International Journal of Wireless Information Networks*, 28, 45–76 (2021).

Conference Papers (peer-reviewed)

[C1] M. Malekzadeh*, **A. Ghasemi***, and H. Pishro-Nik, "Constant-Speed Trajectory Processes for Uniform Coverage in UAV Networks," 59th Annual Conference on Information Science & Systems (CISS), Baltimore, Maryland, USA, 2025.

[C2] **A. Ghasemi** and H. Pishro-Nik, "Tiny Graph Neural Networks for Radio Resource Management," in *Proceedings of tinyML Research Symposium (tinyML Research Symposium'24)*, ACM, Burlingame, CA, USA, 2024, pp. 1–7.

[C3] **A. Ghasemi**, M. Moradikia, R. Zekavat and H. Pishro-Nik, "Adversarial Attacks Targeting Point-to-Point Wireless Networks," 2024 IEEE 99th Vehicular Technology Conference (VTC2024-Spring), Singapore, Singapore, 2024, pp. 1–6.

[C4] **A. Ghasemi**, E. Zeraatkar, M. Moradikia, and R. Zekavat, "Adversarial Attacks on Resource Management in P2P Wireless Communications," 2023 IEEE International Conference on Wireless for Space and Extreme Environments (WiSEE), Aveiro, Portugal, 2023, pp. 148–153.

[C5] **A. Ghasemi** and R. Zekavat, "On Eigenvalue Distribution of Imperfect CSI in mmWave Communications," 2022 IEEE USNC-URSI Radio Science Meeting (Joint with AP-S Symposium), Denver, CO, USA, 2022, pp. 56–57. (***Travel Award***)

[C6] **A. Ghasemi** and R. Zekavat, "Joint Hybrid Beamforming and Dynamic Antenna Clustering for Massive MIMO," 2020 29th Wireless and Optical Communications Conference (WOCC), Newark, NJ, USA, 2020, pp. 1–6. (***Best Paper Award***)

[C7] **A. Ghasemi**, A. F. Jahromi, M. A. Masnadi-Shirazi, M. Biguesh and F. Ghasemi, "Spectrum Allocation Based on Artificial Bee Colony in Cognitive Radio Networks," 6th International Symposium on Telecommunications (IST), Tehran, Iran, 2012, pp. 182–187.

[C8] **A. Ghasemi**, A. F. Jahromi, M. A. Masnadi-Shirazi, M. Biguesh and F. Ghasemi, "Spectrum Allocation with Control of Interference Based on Differential Evolution Algorithm Between Cognitive Radio Users," Proc. 20th Iranian Conf. Elect. Eng. (ICEE), 2012.

[C9] Z. Iqbal, S. Nooshabadi, K. Jadi and **A. Ghasemi**, "Sensor Cooperation and Decision Fusion to Improve Detection in Cognitive Radio Spectrum Sensing," 9th IEEE Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON), New York, NY, USA, 2018, pp. 276–281.

Preprints and Under Review

[P1] **A. Ghasemi** and H. Pishro-Nik, "Minimax Sample Complexity of Graph Neural Networks: Lower Bounds and Structural Effects," Under review (ICLR 2026). OpenReview PDF.

[P2] S. Amini*, **A. Ghasemi***, and H. Pishro-Nik, "Constrained Optimization for Low-rank Training of Graph Neural Networks," Under review (IEEE Transactions on Signal Processing). *Preprint available upon request.*

[P3] E. Aghazade, **A. Ghasemi**, H. Beyhaghi, and H. Pishro-Nik, "Confidence-Guided Early Stopping for Efficient Inference," Under review (ICLR 2026). OpenReview PDF.

[P4] M. Malekzadeh*, **A. Ghasemi***, and H. Pishro-Nik, "Time-Warped Distribution-Matching UAV Trajectories for Buffer-Constrained IoT Data Harvesting," Under review (IEEE Open Journal of the Communications Society). *Preprint available upon request.*

Service

- **University:** Curriculum Committee Member, AI and the Future of Work Track (UMass iCons), 2024–present.

- **Conference Organization:** Organizing Chair, IEEE WiSEE, 2020.
- **Reviewer:** ICLR; IEEE TWC, IEEE TVT, IEEE TCOM, IEEE TIFS; EURASIP JWCN.

Teaching Experience

Teaching Effectiveness (UMass Amherst student evaluations; response rate 63%)

- Overall instructor effectiveness: **4.7/5.0** (Dept 4.2; Campus 4.5)
- Well prepared: **5.0** (Dept 4.6; Campus 4.7)
- Used class time well: **5.0** (Dept 4.4; Campus 4.6)
- Showed interest in helping students learn: **5.0** (Dept 4.5; Campus 4.7)

Instructor of record / Co-Instructor

Fall 2025	**ECE690: Foundations of Generative Models (Graduate)** *Co-Instructor*	UMass Amherst
Fall 2025	**ECE150: Better Decisions by Human & AI (Undergraduate)** *Instructor*	UMass Amherst
Spring 2025, Summer 2024, Spring 2024	**ECE601: Machine Learning for Engineers (Graduate)** *Instructor / Co-Instructor*	UMass Amherst
Fall 2024	**ECE565: Digital Signal Processing & Representation (Graduate)** *Instructor*	UMass Amherst
Summer 2024	**ECE579: Math Tools for Data Science & Machine Learning (Graduate)** *Instructor*	UMass Amherst
Fall 2023	**ECE566: Digital Image Processing (Graduate)** *Instructor*	UMass Amherst

Teaching Assistant

Spring 2022, Fall 2021, Fall 2020	**DS517: Math Foundations for Data Science (Graduate)** *Graduate Teaching Assistant*	WPI
Spring 2021	**DS541: Deep Learning (Graduate)** *Graduate Teaching Assistant*	WPI
Spring 2020	**DS2010: Data Science II: Modeling & Data Analysis (Undergraduate)** *Graduate Teaching Assistant*	WPI
Fall 2019	**ECE2312: Signal and System Analysis (Undergraduate)** *Graduate Teaching Assistant*	WPI

Course & Curriculum Development

2024–Present	**Curriculum Development for New iCons Track** *AI and the Future of Work, Curriculum Committee Member*	UMass Amherst
Fall 2025	**Developed New Graduate Course** *ECE690: Foundations of Generative Models*	UMass Amherst
Spring 2024	**Developed New Graduate Course** *ECE601: Machine Learning for Engineers*	UMass Amherst

Mentorship

Research mentor (lead/co-mentor): 3 Ph.D., 1 M.Sc., 5 UG students.

Selected outcomes: 1 IEEE journal acceptance; 1 peer-reviewed conference acceptance; 1 ICLR submission; undergraduate Honors thesis; dataset curation + LLM fine-tuning; AI-tutor prototype.

Spring 2025 – Present	**Ehsan Aghazadeh**, Ph.D. student, Computer Science (CICS) *Focus:* Efficient and accurate LLM test-time scaling. *Outcome:* ICLR submission.	UMass Amherst

2024–Present	**Masoud Malekzadeh**, Ph.D. student, Electrical and Computer Engineering *Focus:* Machine learning-based unmanned aerial vehicle (UAV) trajectory design. *Outcome:* IEEE journal paper and IEEE conference paper acceptance.	UMass Amherst
2024–Present	**Ameneh Arzheh**, Ph.D. student, Nursing *Focus:* Human-milk data augmentation using generative AI. *Outcome:* Manuscript in preparation.	UMass Amherst
Fall 2025	**Thuyen Pham**, UG student, Mathematics and Computer Science *Focus:* Automated imaging for butterfly identification. *Outcome:* Research direction adopted as Honors thesis.	UMass Amherst
Fall 2025 – Present	**Giap Hoang Nguyen**, UG student, Mathematics and Computer Science *Focus:* UAV orchestration using graph neural networks. *Outcome:* Project initiated; baselines and experimental plan underway.	UMass Amherst
Summer 2025 – Present	**Huy Gia Cao**, UG student, Electrical and Computer Engineering *Focus:* Supervised and RL-based LLM fine-tuning. *Outcome:* Fine-tuned LLM and curated a large training dataset.	UMass Amherst
Summer 2025 – Present	**Jake Reid**, UG student, Electrical and Computer Engineering *Focus:* Dataset preparation for LLM fine-tuning. *Outcome:* Curated a large training dataset.	UMass Amherst
Summer 2025	**Mykaala Firdaus**, UG student, Electrical and Computer Engineering *Focus:* Dataset preparation for LLM fine-tuning & AI-Tutor. *Outcome:* Curated a large dataset; AI-Tutor prototype completed.	UMass Amherst
2024	**Ritik Shah**, M.Sc. student, Electrical and Computer Engineering *Focus:* Neural architecture search system. *Outcome:* Continued as graduate-level research direction.	UMass Amherst

Invited Talks

May 2024	**TinyML Research Symposium** *Tiny Graph Neural Networks for Radio Resource Management*	Burlingame, CA
May 2023	**NEWSDR: New England Workshop on Software-Defined Radio** *Adversarial Attacks on Graph Neural Network-based Wireless Communications*	Worcester, MA

Industry & Applied Research Experience

Internship (Sponsor: Ford Motor Inc.), Wireless Positioning Lab., Michigan Tech., MI **Summer 2019**
Focus: CNN-based perception for autonomous-vehicle scenarios.
Contributions: trained and evaluated CNN models on driving data; performed robustness/ablation analyses; delivered reproducible experiments and sponsor-facing technical results (code + reports).

Data Scientist, Hormozgan Electricity Distribution Co., Bandar Abbas, Iran **2015 - 2018**
Focus: Built operational analytics for power distribution reliability: forecasting, anomaly detection, and decision support; delivered stakeholder-facing reports and maintained production data workflows.

Professional Memberships

2020–present	Institute of Electrical and Electronics Engineers (IEEE)