

Arya Abdollahi, Ph.D.

RTD-a (Fixed-term Researcher) /
Non-tenure-track Assistant Professor
Electrical Power Systems Engineering

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📅 July 30, 1994

Academic Positions

- 12/2023–10/2026 **RTD-a, Fixed-term Researcher**, *Polytechnic University of Bari, Italy*, Department of Electrical and Information Engineering (DEI), *PNRR-funded*
- Led and contributed to research projects focused on the stability and control of microgrids.
 - Applied machine learning and deep learning techniques to optimize energy system management.
 - Conducted research on hydrogen-based energy storage systems and their integration into smart grids.
 - Managed multidisciplinary projects from inception to completion, collaborating closely with graduate research teams.
 - Co-leader of PRINCE Lab, mentoring PhD and master's students.
- 03/2023–12/2023 **Transition Period**
- Conducted an academic job search for postdoctoral and research positions at European universities and research institutions.
 - Participated in an international selection process involving multiple interview rounds and an extended evaluation period.
 - Completed all administrative and legal procedures for international relocation, including visa application at the Italian Embassy in Tehran and work permit issuance.
 - Undertook professional development through online courses in research proposal writing and scientific publishing.
- 09/2018–03/2023 **Research Assistant**, *Azərbaycan Şahid Mədanı Universiteti, Təbriz, İran*, Faculty of Electrical Engineering
- Conducted doctoral research on optimal PMU placement strategies for asymmetrical smart distribution networks.
 - Designed advanced optimization and state estimation algorithms for smart grid monitoring.
 - Collaborated with graduate students on research projects.

Industry Experience

- 03/2020–06/2021 **Researcher**, *Təbriz Electric Power Distribution Company, Təbriz, İran*
- Evaluated automation stations to support strategic planning and operational improvements.
 - Optimal allocation of automation resources to improve reliability and reduce costs.
 - Contributed to distribution system planning integrating technical and economic considerations.
- 01/2016–06/2016 **Commissioning and Dispatching Engineer**, *Electric Power Distribution Company, Təbriz, İran*
- Supervised commissioning of automation substations.
 - Managed real-time monitoring and control via SCADA.
 - Ensured reliable operation and integration of SCADA systems.

Education

- 09/2018–03/2023 **Ph.D. in Electrical Engineering (Power Systems)**, *Azərbaycan Şahid Mədanı Universiteti, İran*
Dissertation: Optimal Placement of Micro-Phasor Measurement Units for Full Observability of Asymmetrical Smart Distribution Networks. GPA: 3.9/4.0
- 09/2016–09/2018 **M.Sc. in Electrical Engineering (Power Systems)**, *Azərbaycan Şahid Mədanı Universiteti, İran*
Thesis: Optimal Energy Management of Distribution Networks with Presence of Battery Storage for Congestion Management. GPA: 3.7/4.0
- 06/2016–09/2016 **Preparation for Master's Entrance Examination**
Preparation for the Master's degree entrance examination following completion of the B.Sc. degree.

Research Interests

Operation and Planning of Distribution Systems, Artificial Intelligence, Micro and Smart Grids, Energy Management Systems, Power and Energy Markets, Energy Storage & Hydrogen Systems, Electric Vehicles and Grid Integration, Demand Side Management, Hybrid Renewable Energy Integration, Power System Dynamics and Stability, Power System Flexibility & Resilience, Smart Grid Monitoring & μ -PMU

Publications

Journal Articles

- [1] **A. Abdolahi**, G. Amato, L. P. Savastio, E. E. De Tuglie, and D. Rasolomampionona, "Synergistic approach for congestion management using hydrogen storage and ancillary services," *Journal of Energy Storage*, vol. 152, p. 120746, 2026. (JCR IF: 9.8 (Q1))
- [2] **A. Abdolahi** and S. C. Khavar, "Enhancing the flexibility of decentralized energy resources through bi-level optimization in intra-day regional markets," *Renewable Energy Focus*, vol. 56, p. 100778, 2026. (JCR IF: 5.9 (Q1))
- [3] G. Maulà, L. P. Savastio, G. Amato, **A. Abdolahi**, and E. E. De Tuglie, "Characterization of disturbances induced by a microgrid on the distribution network," *Sustainable Energy, Grids and Networks*, vol. 101843, Jul. 2025. (JCR IF: 5.6 (Q1))
- [4] A. A. Darban, M. Rajabi Nasab, and **A. Abdolahi**, "Anomaly detection in solar farms with a hybrid CNN-ViT model to enhance accuracy and efficiency," *International Journal of Ambient Energy*, vol. 46, no. 1, p. 2541270, 2025. (Scopus SJR: 0.45 (Q2))
- [5] S. S. Gharehveran, K. Shirini, S. C. Khavar, and **A. Abdollahi**, "Optimizing day-ahead power scheduling: A novel MIQCP approach for enhanced SCUC with renewable integration," *e-Prime – Advances in Electrical Engineering, Electronics and Energy*, vol. 2025, p. 101022, May 2025. (Scopus SJR: 0.75 (Q1))
- [6] S. Samadi, K. Shirini, S. H. Mousavi, S. C. Khavar, and **A. Abdollahi**, "Deep learning-based demand response for short-term operation of renewable-based microgrids," *The Journal of Supercomputing*, vol. 80, pp. 26002–26035, 2024. (JCR IF: 2.7 (Q2))
- [7] N. T. Kalantari, **A. Abdolahi**, S. H. Mousavi, S. C. Khavar, and F. S. Gazijahani, "Strategic decision making of energy storage owned virtual power plant in day-ahead and intra-day markets," *Journal of Energy Storage*, vol. 73, p. 108839, 2023. (JCR IF: 9.8 (Q1))
- [8] S. Cheshme-Khavar, **A. Abdollahi**, F. Gazijahani, N. Kalantari, and J. Guerrero, "Short-term scheduling of cryogenic energy storage systems in microgrids considering CHP-Thermal-Heat-Only units and plug-in electric vehicles," *Journal of Operation and Automation in Power Engineering*, 2023. (Scopus SJR: 0.39 (Q3))
- [9] **A. Abdollahi** and N. T. Kalantari, "State Estimation of asymmetrical distribution networks by μ -PMU allocation: A novel stochastic two-stage programming," *Electric Power Systems Research*, vol. 213, p. 108738, 2022. (JCR IF: 4.2 (Q1))
- [10] N. Taghizadegan, S. Cheshmeh Khavar, **A. Abdollahi**, F. Arasteh, and R. Ghoreyshi, "Dominated GSO algorithm for optimal scheduling of renewable microgrids with penetration of electric vehicles and energy storages considering DRP," *International Journal of Ambient Energy*, vol. 43, pp. 6380–6391, 2022. (Scopus SJR: 0.45 (Q2))
- [11] **A. Abdollahi**, R. Ajabi Farshbaf, A. Abbaspour, and M. Khodayari, "Reliability enhancement by strategic placement of remotely-controlled automation devices: A case study on Tabriz distribution network," *Research and Technology in the Electrical Industry*, vol. 1, pp. 36–45, 2022. (Indexed in DOAJ)
- [12] **A. Abdolahi**, N. Taghizadegan, M. R. Banaei, and J. Salehi, "A reliability-based optimal μ -PMU placement scheme for efficient observability enhancement of smart distribution grids under various contingencies," *IET Science, Measurement & Technology*, vol. 15, pp. 663–680, 2021. (JCR IF: 1.3 (Q3))

- [13] **A. Abdolahi**, J. Salehi, F. S. Gazijahani, and A. Safari, "Assessing the potential of merchant energy storage to maximize social welfare of renewable-based distribution networks considering risk analysis," *Electric Power Systems Research*, vol. 188, p. 106522, 2020. (JCR IF: 4.2 (Q1))
- [14] **A. Abdolahi**, F. S. Gazijahani, A. A. Alizadeh, and N. T. Kalantari, "Chance-constrained CAES and DRP scheduling to maximize wind power harvesting in congested transmission systems considering operational flexibility," *Sustainable Cities and Society*, vol. 51, p. 101792, 2019. (JCR IF: 12.0 (Q1))
- [15] J. Salehi and **A. Abdolahi**, "Optimal scheduling of active distribution networks with penetration of PHEV considering congestion and air pollution using DR program," *Sustainable Cities and Society*, vol. 51, p. 101709, 2019. (JCR IF: 12.0 (Q1))
- [16] **A. Abdolahi**, J. Salehi, F. Samadi Gazijahani, and A. Safari, "Probabilistic multi-objective arbitrage of dispersed energy storage systems for optimal congestion management of active distribution networks including solar/wind/CHP hybrid energy system," *Journal of Renewable and Sustainable Energy*, vol. 10, 2018. (JCR IF: 1.9 (Q3))
- [17] S. M. Farshbaf, K. Shirini, S. S. Gharehveran, and **A. Abdollahi**, "Reducing Phase Lag and Noise in Residential Load Forecasting with a Hybrid Residual-Attention Model," *Algorithms*, vol. 19, no. 8, p. 661, 2026. (JCR IF: 2.6 (Q2))
- [18] G. Amato, E. E. De Tuglie, L. P. Savastio, and **A. Abdollahi**, "Beyond the Critical Point: Microgrid Security Assessment," *IEEE Access*, published September 10, 2026. (JCR IF: 4.2 (Q1))
- [19] **A. Abdollahi**, E. E. De Tuglie, G. Amato, L. P. Savastio, D. D. Rasolomampionona, and K. Zagrajek, "Deep reinforcement learning-based hydrogen energy storage arbitrage within risk-aware social welfare optimization," *International Journal of Hydrogen Energy*, vol. 278, p. 157725, 2026. (JCR IF: 9.2 (Q1))

Paper Under Review

- [20] W. Wróblewski, D. Rasolomampionona, R. Kowalik, **A. Abdollahi***, G. Amato, and E. E. De Tuglie, "Real-Time Hardware-in-the-Loop Simulation for LVRT Compliance Assessment of Wind Farms Considering Auto-Reclosure Conditions," *International Transactions on Electrical Energy Systems*, under review, 2026.
- [21] M. Połecki, D. Rasolomampionona, Y. Yeleukenov, **A. Abdollahi***, G. Amato, and E. E. De Tuglie, "Enhanced Load Frequency Control of Two-Area Power Systems with Renewable Energy Sources Using Particle Swarm Optimization," *Scientific Reports*, under review, 2026.

Book Chapters

- [22] S. S. Gharehveran, K. Shirini, and **A. Abdollahi**, "Optimizing energy storage solutions for grid resilience: A comprehensive overview," *Energy Storage Devices – A Comprehensive Overview*, Jan. 14, 2025.
- [23] **A. Abdollahi**, S. Cheshmeh Khavar, M. Nazari-Heris, and N. T. Kalantari, "Optimizing μ -PMU placement for estimating asymmetrical distribution network states: Introducing a novel stochastic two-stage approach," in *Kalman Filters Theory, Applications, and Optimization*, 2023.
- [24] **A. Abdollahi**, F. S. Gazijahani, N. T. Kalantari, and J. Salehi, "Techno-economic framework for congestion management of renewable integrated distribution networks through energy storage and incentive-based demand response program," in *Demand Response Application in Smart Grids: Operation Issues-Volume 2*, pp. 241–264, 2020.

Conference Papers

- [25] **A. Abdollahi**, E. E. De Tuglie, and G. Amato, "Risk-aware day-ahead bidding strategy for a CHP-based microgrid with renewable energy and demand response" *IEEE International Conference on Environment and Electrical Engineering and 2026 IEEE Industrial and Commercial Power Systems Europe (EEEIC/I&CPS Europe)*

- [26] G. Amato, E. E. De Tuglie, L. P. Savastio, **A. Abdollahi**, D. D. Rasolomampionona, M. Kłos, "Real-Time Energy Efficiency Analysis and Optimization of Complex Multi-Carrier Energy Systems" *IEEE International Conference on Environment and Electrical Engineering and 2026 IEEE Industrial and Commercial Power Systems Europe (EEEIC/I&CPS Europe)*
- [27] **A. Abdollahi**, G. Amato, L. P. Savastio, and E. E. De Tuglie, "A game-theoretic optimization framework for secure and cost-efficient dynamic reconfiguration of multi-microgrids," in *Intelligent Technology for Power and Energy Systems (ITPES 2025)*, G. M. Lee and P. Siano, Eds., Cham, Switzerland: Springer, 2026.
- [28] E. E. De Tuglie, L. P. Savastio, G. Amato, G. Maulà, and **A. Abdollahi**, "Enhancing Control in Microgrids with Simulink and OPC: A Methodology to Boost Researchers' and Students' Skills," in *The Learning Ideas Conference 2025*, Cham: Springer Nature Switzerland, 2025.
- [29] G. Amato, L. P. Savastio, G. Maulà, **A. Abdollahi**, E. E. De Tuglie, and E. Brescia, "Enhancing resilience and security in future networks: A new strategy for smart microgrids," in *Proc. 9th Int. Conf. Clean Electr. Power (ICCEP)*, Sardinia, Italy, Jun. 24–26, 2025.
- [30] **A. Abdollahi**, G. Amato, L. P. Savastio, G. Maulà, and E. E. De Tuglie, "Efficient static security assessment of microgrids through practical feasibility region definition," in *Proc. 2025 IEEE Kiel PowerTech*, Kiel, Germany, Jun. 29–Jul. 3, 2025, pp. 1–6.
- [31] S. H. Mousavi, **A. Abdolahi**, S. C. Khavar, and N. T. Kalantari, "Optimal trade-off between cost and emission for energy hubs management in smart residential buildings," in *2023 27th International Electrical Power Distribution Networks Conference (EPDC)*, pp. 43–47, 2023.
- [32] S. C. Khavar and **A. Abdolahi**, "Techno-economic dispatch of distributed energy resources for optimal grid-connected operation of a microgrid," in *2022 30th International Conference on Electrical Engineering (ICEE)*, pp. 507–511, 2022.
- [33] S. H. Mousavi, V. Janatifar, **A. Abdolahi**, and M. Sarhangzadeh, "Optimal scheduling of active distribution networks with high penetration of plug-in electric vehicles and renewables using grasshopper optimization algorithm," in *2021 29th Iranian Conference on Electrical Engineering (ICEE)*, pp. 313–317, 2021.
- [34] **A. Abdolahi**, A. Namvar, and N. Taghizadegan Kalantari, "Distribution system reconfiguration to improve reliability and reduce power loss utilizing BPSO algorithm," in *3rd National Conference on New Achievements in Electrical, Computer and Industrial Engineering*, 2017.

Research Projects & Funding

- 03/2020–06/2021 **National Competitive Research Project**, *Electric Power Distribution Company*, Tabriz, Iran
- **Project Title:** Assessment of the current status of automation stations in the Tabriz electrical distribution network and proposal of optimal placement solutions to improve reliability indices and reduce operational costs.
 - **Role:** Scientific responsibility and project executor
 - **Duration:** 14 months
 - **Funding:** €10,000
 - **Funding Scheme:** Competitive peer-reviewed call
 - **Outputs:** One peer-reviewed national journal article; one official technical report.

Teaching Experience

- 03/2020–06/2021 **Instructor**, *Azərbaycan Şahid Mədanı University*
Electro-Technical Laboratory, Protection Relays Lab, Linear Control Systems Lab, Fundamentals of Electrical Engineering, Electrical Machines Lab
- 01/2020–06/2021 **Instructor**, *Tabriz Technical Complex, Iran*
MATLAB Programming Course (Professional Training)
- 09/2025 **Guest Lecturer**, *Warsaw University of Technology, Poland*
Efficient Static Security Assessment of Microgrids, Real-Time Economic Dispatch of Microgrids, Day-Ahead Economic Dispatch of Microgrids
- 03/2026–07/2026 **Lecturer (Master's Level)**, *Polytechnic University of Bari, Italy*
Course: Smart Electric Systems

Academic Qualifications

07/2026–07/2038 **National Scientific Qualification (ASN)** – Associate Professor/Senior Researcher
Italian Ministry of University and Research - Qualified for the role of Associate Professor in the Italian Higher Education System - Disciplinary Field: 09/E2 – Electrical Energy Engineering.

Supervision

PhD Students – Scientific Advisor

12/2023–09/2026 **Designing Multi-Vector Microgrids for Optimal Investments: Renewable, Storage, and Hydrogen Solutions** – Politecnico di Bari

Provided guidance on the optimization framework, techno-economic analysis of integrated energy systems, review and interpretation of research results, and thesis preparation.

09/2020–09/2024 **Multi-objective Reconfiguration of Microgrids in the Presence of Electric Vehicles for Smoothing Local Distribution Marginal Pricing** – Azarbaijan Shahid Madani University

Provided guidance on research topic definition, identification of research contributions and innovations, research proposal development, modeling and simulations, results analysis, and thesis review.

Editorial & Reviewing Activities

Editorial Roles

2025-2030 Scientific Reports – Assistant Editor
2025-2030 Scientific Reviews – Assistant Editor
2025-2027 Algorithms – Guest Editor
2026-2028 Scientific Reports – Guest Editor

Reviewer

Energy; Solar Energy; Electric Power Systems Research; Journal of Cleaner Production; Journal of Energy Storage; Computers and Electrical Engineering; Energy and Built Environment; Sustainable Energy Technologies and Assessments; Sustainable Energy, Grids and Networks; Applied Energy; Energy Strategy Reviews; International Journal of Energy Research; Heliyon; IEEE Access; IEEE Canadian Journal of Electrical and Computer Engineering; Iranian Journal of Science and Technology, Transactions of Electrical Engineering; IET Generation, Transmission & Distribution; Electrical Engineering; Energy Informatics; Cybernetics and Systems; Cogent Engineering; Processes; Energies; Eng; Sustainability; IEEE PowerTech Conference; Power Systems Computation Conference; ECCE Conference.

Awards and Honors

2025 Recipient of the graduate assistant in areas of PNRR fellowship
2025 Selected as IEEE PES young professional member
2024 Outstanding contribution in reviewing, Energy journal
2022 Outstanding graduate student (PhD), Department of Electrical Engineering, Azarbaijan University

Skills

Programming MATLAB, Python
Power System MATLAB Matpower, DigSILENT
Tools
Optimization & GAMS, Pyomo
Modeling
AI Python, MATLAB Deep Learning Toolbox
GIS Tool ArcGIS

Languages

Persian Native
English Professional Proficiency (C1)
Turkish Professional Proficiency (C1)
Italian Elementary Proficiency (A2)

References

Name Prof. **Enrico Elio De Tuglie**
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