Abdollah (Hedi) Younesi

Department of Electrical & Computer Engineering,
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Research Interests

- Power system decarbonization
- Power system non-linear optimization and simulation
- Application of Reinforcement Learning (RL) to power system control
- Time Series Analysis and Forecasting
- Resilient operation of power system
- Smart grid technology
- Electricity market
- Renewable & storage energy
- Dispatch control hierarchy
- Data analytics
- Engineering management
- Active distribution systems
- Microgrid
- Digital image processing

Appointments

Postdoc Researcher, Department of Electrical Engineering, University of Mohaghegh Ardabili, Ardabil, Iran, Sep. 2023 – Present.

Senior Research Associate, REMeDY project funded by Innovate **UK** under grant 105843, School of Computing Science, University of East Anglia, United Kingdom, Jan. 2022–Jun. 2022.

Co-founder and data analyst, Viana Industrial Electronic Co., Mahabad, Iran, 2019-Present.

Lecturer, Department of Electrical Engineering, University of Mohaghegh Ardabili, Iran, 2015-2018.

Lecturer, Department of Electrical Engineering, Islamic Azad University, Mahabad Branch, Iran, 2017-2022.

Education

Researcher, Department of Electrical & Computer Engineering: Power Systems, University of Connecticut, USA, Aug. 2022-Feb. 2023.

Ph.D., Department of Electrical & Computer Engineering: Power Systems, University of Mohaghegh Ardabili, Iran, 2015-2021.

M.S., Department of Electrical & Computer Engineering: Power Systems, University of Mohaghegh Ardabili, Iran, 2012-2015.

B.S., Department of Electrical & Computer Engineering: Power Systems, University of Mohaghegh Ardabili, Iran, 2008-2012.

Publications *Journals*

Abdollah Younesi, Zongjie Wang, Pierluigi Siano, "Leveraging Network Reconfiguration and ELCC Quantification to Enhance the Resilience of Zero-Carbon Energy Communities", *Journal of Cleaner Production*, vol. 434, p. 139794, 2024. (ISI-IF: 11.1 (2022))

Abdollah Younesi; Hossein Shayeghi; Zongjie Wang; Pierluigi Siano; Ali Mehrizi-Sani, Amin Safari, "Trends in Modern Power Systems Resilience: State-of-the-Art Review", *Renewable & Sustainable Energy Reviews*, vol. 162, 2022. (ISI-IF: 15.9 (2022))

Abdollah Younesi; Hossein Shayeghi; Pierluigi Siano; Amin Safari, "A Multi-Objective Resilience-Economic Stochastic Scheduling Method for Microgrid", *International Journal of Electrical Power & Energy Systems*, vol. 131, 2021. (ISI-IF: 5.2 (2022))

Abdollah Younesi; Hossein Shayeghi; Pierluigi Siano; Amin Safari; Hassan Haes Alhelou, "Enhancing the Resilience of Operational Microgrids Through a Two-Stage Scheduling Strategy Considering the Impact of Uncertainties", *IEEE Access*, vol. 9, pp. 18454 - 18464. (ISI-IF: 3.9 (2022))

Abdollah Younesi; Hossein Shayeghi; Amin Safari; Pierluigi Siano, "A Quantitative Resilience Measure Framework for Power Systems Against Wide-Area Extreme Events", *IEEE Systems Journal*, vol. 15, no. 1, pp. 915-922, 2021. (ISI-IF: 4.4 (2022))

Abdollah Younesi; Hossein Shayeghi; Amin Safari; Pierluigi Siano, "Assessing the resilience of multi microgrid based widespread power systems against natural disasters using Monte Carlo Simulation", *Energy*, vol. 207, pp. 00-00, 2020. (ISI-IF: 9 (2022))

Abdollah Younesi; Hossein Shayeghi; Pierluigi Siano, "Assessing the Use of Reinforcement Learning for Integrated Voltage/Frequency Control in AC Microgrids", *Energies*, vol. 13, no. 5, pp. 1-22, 2020. (ISI-IF: 3.2 (2022))

Zongjie Wang, **Abdollah Younesi**, M. Vivienne Liu, C. Lindsay Anderson, "AC Optimal Power Flow in Power Systems with Renewable Energy Integration: A Review of Formulations and Case Studies", *IEEE Access*, 2023. (ISI-IF: 3.9 (2022))

Masoud Hamedi, Hossein Shayeghi, Seyedjalal Seyedshenava, Amin Safari, **Abdollah Younesi**, Nicu Bizon, Vasile-Gabriel Iana, "Developing an Integration of Smart-Inverter-Based Hosting-Capacity Enhancement in Dynamic Expansion Planning of PV-Penetrated LV Distribution Networks", *Sustainability*, vol. 15, no. 14, 2023. (ISI-IF: 3.9 (2022))

Masoud Hamedi, Hossein Shayeghi, Seyedjalal Seyedshenava, Amin Safari, **Abdollah Younesi**, Nicu Bizon, "Optimal multi-period planning of the distribution network in the presence of wide-spread penetration of small-scale solar resources", *IET Renewable Power Generation,* 2023. (ISI-IF: 2.6 (2022))

Esmail Khalife, Mohammad Kaveh, **Abdollah Younesi**, Dhinesh Balasubramanian, Shoaib Khanmohammadi, Bahman Najafi "Comparative of various bio-inspired meta-heuristic optimization algorithms in performance and emission of diesel engine fuelled with b5 containing water and cerium oxide additive blends", *International Journal of Energy Research,* doi:10.1002/er.8315, 2022. (ISI-IF: 4.6 (2022))

Hossein Shayeghi, **Abdollah Younesi**, "Enhancement of Voltage/Frequency Stability in an

Autonomous Micro Energy Grid with Penetration of Wind Energy Using a Parallel Fuzzy mechanism", *Iranian Journal of Electrical and Electronic Engineering*, vol. 16, no. 4, pp. 536-550, (ISC-IF: 0.167 & Scopus-SJR: 0.175)

Abdollah Younesi, Hossein Shayeghi, "Q-learning Based Supervisory PID Controller for Damping Frequency Oscillations in a Hybrid Mini/Micro-Grid", *Iranian Journal of Electrical and Electronic Engineering*, vol. 00, no. 0, pp. 00-00, 2018. (ISC-IF: 0.167 & Scopus-SJR: 0.175)

Abdollah Younesi, Hossein Shayeghi, Adel Akbarimajd, Yashar Hashemi, "Design of PSS3B stabilizer using KH Algorithm and Q-Learning for damping Low-frequency Oscillations in SMIB", *Journal of Iranian Association of Electrical and Electronics Engineers*, vol. 14, no. 3, pp. 69-77, 2017. (ISC-IF: 0.269), (In Persian)

Hossein Shayeghi, **Abdollah Younesi**, "An Online Q-learning Based Multi-Agent LFC for a Multi-Area Multi-Source Power System Including Distributed Energy Resources", *Iranian Journal of Electrical and Electronic Engineering*, vol. 13, no. 4, pp. 385-398, 2017. (ISC-IF: 0.167 & Scopus-SJR: 0.175)

Abdollah Younesi, Hossein Shayeghi, Mohammad Moradzadeh, "Application of Reinforcement Learning for Generating Optimal Control Signal to the IPFC for Damping of Low-Frequency Oscillations", *International Transactions on Electrical Energy Systems*, vol. 28, no. 2, 2018. (ISI-IF: 2.639 (2022))

Mehran Esmaeili, Hossein Shayeghi, Hamid Mohammad nejad, **Abdollah Younesi**, "Reinforcement learning based PID controller design for LFC in a microgrid", *COMPEL - The international journal for computation and mathematics in electrical and electronic engineering*, vol. 36, no. 4, pp. (ISI-IF: 0.7 (2022))

Hossein Shayeghi, **Abdollah Younesi**, "A robust discrete fuzzyP + fuzzyI + fuzzyD load frequency controller for multi-source power system in restructuring environment", *Journal of Operation and Automation in Power Engineering*, vol. 5, no. 1, pp. 61-74, 2017. (Scopus-indexed)

Hossein Shayeghi, **Abdollah Younesi**, Yashar Hashemi, "Simultaneous tuning of multi-band power system stabilizer and various IPFC-based damping controllers: an effective method for mitigation of low frequency oscillations", *International Journal of Mechatronics, Electrical and computer technology*, vol.5, no. 17, pp. 2443-2454, 2015.

Hossein Shayeghi, **Abdollah Younesi**, Yashar Hashemi, "Optimal design of a robust discrete parallel FP + FI + FD controller for the Automatic Voltage Regulator system", *International Journal of Electrical Power and Energy Systems*, vol. 67, pp. 66-75, May2015. (ISI-IF: 5.2 (2022))

Mohammad Kaveh, Reza Amiri Chayjan, Ebrahim Taghinezhad, Yousef Abbaspour Gilandeh, **Abdollah Younesi**, Vali Rasooli Sharabiani, "Modeling of thermodynamic properties of carrot product using ALO, GWO, and WOA algorithms under multi-stage semi-industrial continuous belt dryer", *Engineering with Computers*, vol. 35, no. 3, pp. 1045-1058, 2019. (ISI-IF: 8.7 (2022))

Abdollah Younesi, Wanqing Zhao, Masoud Salehi-Borujeni, "A Decarbonized Pathway to Cost-Efficient Dynamic Management of Electric-Thermal Microgrid Through

Reinforcement Learning", *IEEE Transactions on Smart Grid*, (Ready to Submit).

Abdollah Younesi, Zongjie Wang, "Investigating the Fragility of the Power System Against Extreme Events: A Quest for Resilience Assessment", *IEEE Transactions on Power Systems*, (In Preparation).

Book Chapters

Hossein Shayeghi, **Abdollah Younesi**, "Fuzzy PID Control of Microgrids", Microgrid Architectures, Control and Protection Methods, 2020-Springer.

Hossein Shayeghi, **Abdollah Younesi**, "Adaptive and Online Control of Microgrids Using Multi-Agent Reinforcement Learning", Microgrid Architectures, Control and Protection Methods, 2020-Springer.

Hossein Shayeghi, **Abdollah Younesi**, "Resilience Metrics Development for Power Systems", Power Systems Resilience, 2019-Springer.

Edited Books

Zongjie Wang, **Abdollah Younesi**, Eds., "Energy Storage Applications in Power Systems", IntechOpen, Aug. 30, 2023. doi: 10.5772/intechopen.104058.

Conference Proceedings

Abdollah Younesi, Zongjie Wang, Timothy M. Hansen, " DER Analysis with Effective Load Carrying Capability for Enhanced Carbon-Aware Active Distribution System Resilience", *IEEE PES General Meeting* 2024.

Abdollah Younesi, Zongjie Wang, S. A. Dorado-Rojas, P. Mandal, " Quantification of DERs Penetration Level in Microgrids: A Quest for Enhancing Short-Term Power Grid Resilience", *IEEE PES General Meeting* 2023.

Abdollah Younesi, Zongjie Wang, Pierluigi Siano, Fengyu Wang, " A Pathway to Mitigate Climate Change Impacts on Energy Communities: Decarbonization-Based Cost-Effective Grid Resilience Enhancement", *IEEE PES General Meeting* 2023.

Abdollah Younesi; Zongjie Wang; H.T. Nguyen; Paras Mandal; "A Pathway to Enhance the Modern Distribution Systems Resilience: Flexible Behavior Investigations on Electric Vehicles", *The 2022 IEEE PES General Meeting*, July 17-22, Denver, CO, USA 2022.

Abdollah Younesi; Zongjie Wang; L. Wang; " Investigating the Impacts of Climate Change and Natural Disasters on the Feasibility of Power System Resilience", *The 2022 IEEE PES General Meeting*, July 17-22, Denver, CO, USA, 2022.

Heydar Ali Shayanfar, Hossein Shayeghi, **Abdollah Younesi**, "Optimal PID Controller Design Using Krill Herd Algorithm for Frequency Stabilizing in an Isolated Wind Diesel System", *Proc. of 17th International Conference on Artificial Intelligence*, July.27-30, 2015, Las Vegas, USA.

Hossein Shayeghi, Heydar Ali Shayanfar, **Abdollah Younesi**, "Frequency Stabilization in an Isolated Wind-Diesel System Using ISA-Based PID Controller", *Proceedings of the*

International Conference on Scientific Computing (CSC'16), pp. 53-58, Las Vegas, USA, 2016.

Hossein Shayeghi, Heydar Ali Shayanfar, **Abdollah Younesi**, "PID Type Stabilizer Design Using Grey Wolfe Optimization Algorithm", *Proceedings of the International Conference on Scientific Computing (CSC'16)*, pp. 307-313, Las Vegas, USA, 2016.

Hossein Shayeghi, Heydar Ali Shayanfar, Sajad Asefi, **Abdollah Younesi**, "Optimal Tuning and Comparison of Different Power System Stabilizers Using Different Performance Indices via Jaya Algorithm", *Proceedings of the International Conference on Scientific Computing (CSC'16)*, pp. 34-40, Las Vegas, USA, 2016.

Hossein Shayeghi, **Abdollah Younesi**, "Application of Krill Herd Algorithm for PID Type Stabilizer Design", *The 5th International Scientific Conference of Iranian Academicians Abroad in Turkey*, Feb. 20-21, 2015, Ankara, Turkey.

Hossein Shayeghi, Sajad Asefi, **Abdollah Younesi**, "Frequency Deviation Improvement of a Hybrid Micro-Grid System Containing Wind Turbine and Controllable load using Fractional Order PID", *Proceedings of the International Conference on Sustainability, Green Building, Environmental Engineering & Renewable Energy (SGER 2016)*, pp. 141-148, Kuala Lumpur, Malaysia, 2016.

Heydar Ali Shayanfar, Hossein Shayeghi, Sajad Asefi and **Abdollah Younesi**, "Design of Optimal PID Controller Using Jaya Algorithm for Frequency Stabilizing in an Isolated Wind-Diesel System", *Proceedings of the 12th International Conference on Technical and Physical Problems of Electrical Engineering, University of Basque Country Bilbao*, Spain, 2016.

Masoud Mohammadzadeh, Hossein Shayeghi, **Abdollah Younesi**, "Robust PID Type Controller Design Using ALO Algorithm for Automatic Voltage Regulator System", *The 3rd International Caucasus Universities Association Graduate Students Symposium*, University of Mohaghegh Ardabili, Ardabil, Iran, 2016.

Hossein Shayeghi, Mina Heshmati, **Abdollah Younesi** and Rashid Dadkhah Doltabad, "Coefficient Diagram Method in a Nonlinear Power System as Load Frequency Controller Using Krill Herd Algorithm", *Proceedings of the 12th International Conference on Technical and Physical Problems of Electrical Engineering, University of Basque Country Bilbao*, Spain, 2016.

Hossein Shayeghi, Sajad Asefi and **Abdollah Younesi**, "Optimizing Fractional Order PID Controller Using Jaya Algorithm for Frequency Stabilizing in an Isolated Wind-Diesel System", *1st International Conference on Application of Advanced Technologies (ICAAT'1)*, pp. 392-398, Namin, Ardabil, Iran.

Maryam Houshyari, Hossein Shayeghi and **Abdollah Younesi**, "Comparison of PID Type Controller Performance in Microgrid Frequency Deviation Enhancement Using MFO Algorithm", *The 3rd International Caucasus Universities Association Graduate Students Symposium, University of Mohaghegh Ardabili*, Ardabil, Iran, 2016.

Selected Conference Presentations

Selected Conference Posters

Projects

REMeDY project funded by **Innovate UK** under grant 105843, School of Computing Science, University of East Anglia, United Kingdom, Jan. 2022–Jun. 2022.

Using the fuzzy control method for simultaneously stabilizing oscillations of voltage and frequency in a microgrid including energy renewables, Funded by the University of Mohaghegh Ardabili, 2019, Colleague.

Voltage Stability Enhancement of Islanded Micro Grid with High Penetration of Wind Turbines Using Q-learning Method. ,Funded by the University of Mohaghegh Ardabili, 2018, Colleague.

Design of Adaptive Reinforcement Learning Based Frequency Controller for Hybrid Microgrids Including Energy Storages, Funded by the University of Mohaghegh Ardabili, 2017, Colleague.

Reinforcement Learning Based Load Frequency Control in a Multi-Source Power System, Funded by the University of Mohaghegh Ardabili, 2016, Colleague.

Optimal Design of FuzzyP+FuzzyI+FuzzyD controller for LFC of a Restructured Power System, Funded by the University of Mohaghegh Ardabili, 2015, Colleague.

Teaching

University of Mohaghegh Ardabili (Instructor)

Power System Analysis (3 credits).

Engineering Mathematics (3 credits).

Electrical Engineering Fundamentals II (3 credits).

Electric Power Transmission (3 credits).

Electrical Circuits I (3 credits).

Control Systems Lab (1 credits).

Electrical Circuits Lab (1 credits).

Electric Machines I Lab (1 credits).

University of Mohaghegh Ardabili (Teaching Assistant)

Deregulation in Power Engineering (Power market) (3 credits).

FACTS Devices (3 credits).

Power System Dynamics (3 credits).

Modern Control (3 credits).

Islamic Azad University, Mahabad Branch (Instructor)

Electric Machines I (2 credits).

Power System Fundamentals (2 credits).

Special Electrical Machines (2 credits).

Advising

University of Mohaghegh Ardabili

Kasra Mehrabani Far, PhD, Co-Advisor, 2021-present.

Masoud Hamedi, PhD, Co-Advisor, 2021-present.

Ghader Dashti, Master, Co-Advisor, 2019.

Masoud Mohammad zadeh, Master, Co-Advisor, 2017.

Sima Saadat, Master, Co-Advisor, 2017.

Vahid Alizadeh, Master, Co-Advisor, 2017.

Farzaneh Khajvand, Master, Co-Advisor, 2017.

Awards

Top PhD thesis, University of Mohaghegh Ardabili, 2021.

Top Student in National Elite Foundation of Iran, 2017 and 2018.

Academic Award (Educational and Research), National Elite Foundation of Iran, 2017 and 2018.

Selected as a brilliant talent student (first-degree student from the Faculty of Engineering), University of Mohaghegh Ardabili, 2018.

Selected Specialized Innovation Zone and Energy Technologies, RINOTEX, 2019.

B.Sc. Degree, Second Class Honor, University of Mohaghegh Ardabili, 2012.

Master studies admission through recognized (exceptional talented) student society found. (With no test), University of Mohaghegh Ardabili, 2012.

Won the third place in Second Iranian Competition on Smart Grid, at the field of "optimum design of distributed generation in the smart grid", 2017.

M.Sc. Degree, First Class Honor, University of Mohaghegh Ardabili, 2015.

Active and innovative team in East Azerbaijan (Intelligent Drive Team), 2017.

Superior idea "Design and implementation of advanced control for all types of electric machines", West Azerbaijan Science & Technology Park, 2017.

Skills

Programming: MATLAB, GAMS, PYTHON, C++, CUDA, EES.

Software: LaTeX, Office (Word, Excell, Power Point, Visio), etc.

Patent

12-Channel 40 kHz power analyzer, no. 97339, Iran, 2018.

Professional

Student Member of IEEE, 2012-2018, 2022-present.

Executer Manager, Journal of Operation and Automation in Power Engineering, University of Mohaghegh Ardabili, 2014-present.

Journal reviewer (IEEE Transactions on Industrial Informatics, IEEE Access, IEEE Systems journal, Applied Energy, Energy-Elsevier, IET Renewable power generation, IET Generation, Transmission, and Distribution, IET Smart Grid)

Language

Kurdish, Native.

Farsi (Persian), Fluent.

English, Upper-intermediate, IETLS UKvi, Overall score :6 (Listening 6, Reading 6, Writing 6, Speaking 6.5), 9th October, 2021. (Duolingo score: 100, 27th July, 2021)

Turkish-Azerbaijani, Upper-intermediate

References

Prof Hossein Shayeghi, University of Mohaghegh Ardabili, Iran, hshayeghi@gmail.com, since 2008.

Prof Pierluigi Siano, University of Salerno, Italy, psiano@unisa.it, since 2017.

Prof Wanqing Zhao, University of Newcastle, UK, Wanqing.Zhao@newcastle.ac.uk, since 2022.