Sina Mohammadi

PhD Candidate, Electrical & Computer Engineering
University of Michigan-Dearborn
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Education

- **Ph.D., Electrical and Computer Engineering** — Michigan, USA
  University of Michigan-Dearborn; GPA: 3.88/4 — *2023-present*
  Dissertation Title: *Machine Learning Applications for Optimizing Power Systems Operation*
  Supervisor: *Wencong Su, Ph.D.*
- **M.Sc., Electrical Engineering** — Zanjan, Iran
  University of Zanjan; GPA: 3.42/4 — *2016-2019*
  Thesis Title: *An Optimal Strategy for Protection of Inverter-Interfaced Microgrids in Different Working Modes*
  Thesis Supervisors: *Mansour Ojaghi, Ph.D., Abolfazl Jalilvand, Ph.D.*
  Thesis Advisor: *Qobad Shafiee, Ph.D.*
  Thesis Grade: *19.5/20*
- **B.Sc., Electrical Engineering** — Sanandaj, Iran
  University of Kurdistan; GPA: 3.19/4 — *2012-2016*
  Thesis Title: *Analysis, Modeling and Comparison of Different Types of Power Converters in Switched Reluctance Motor for Reducing the Torque Ripples*
  Thesis Supervisor: *Rahmatollah Mirzaei, Ph.D.*

Research Interests

Machine Learning for Solving Optimal Power Flow
Large Language Models Applications in Power Systems
State Estimation in Power Systems
Power System Protection

Publications

- **Journal Papers**

1. **S. Mohammadi**, W. Su (2026) “An Accurate Modulation-Assisted Method for Phasor Estimation Under Decaying DC Offsets” *IEEE Transactions on Power Delivery*, Under Review.
2. **S. Mohammadi**, V. Hai-Bui, W. Su (2026) “Topology Recovery in Distribution Networks Using Distance-Aware Mutual Information (DAMI) Method,” *Electric Power System Research*, vol. 265, p. 114307.
   [Q1, IF= 4.3]
   DOI: 10.1016/j.epsr.2026.114307
3. **S. Mohammadi**, W. Wang, M. Wada, R. Haghighi, A. Hassan, H. Liu, A. Bhatnagar, A. Chen, W. Su (2026) “Grid Integration of AI Data Centers: A Critical Review of Energy Storage Solutions,” *Advances in Applied Energy*, 100291.
   [Q1, IF= 18.3]
   DOI: 10.1016/j.adapen.2026.100291
4. V. Hai-Bui, **S. Mohammadi**, S. Das, A. Hussain, G. Hollweg, W. Su (2025) “A Critical Review of Safe Reinforcement Learning Strategies in Power and Energy Systems,” *Engineering Applications of Artificial Intelligence*, , vol. 143, p. 110091.
   [Q1, IF=7.5]
   DOI: 10.1016/j.engappai.2025.110091
5. **S. Mohammadi**, V. Hai-Bui, W. Su, B. Wang (2024) “Surrogate Modeling for Solving OPF: A Review,” *Sustainability*, vol. 16, no. 22, p. 9851.
   [Q1, IF=3.3]
   DOI: 10.3390/su16229851
6. **S. Mohammadi**, A. Mahmoudi, S. Kahourzade, A. Yazdani, GM Shafiullah (2022) “Decaying DC Offset Current Mitigation in Phasor Estimation Applications: A Review,” *Energies*, vol. 15, no. 14, p. 5260.
   [Q1, IF=3]
   DOI: 10.3390/en15145260
7. **S. Mohammadi**, N.Rezaie, A. Mahmoudi (2022) “A Novel Analytical Method for DC offset Mitigation Enhancing DFT Phasor Estimation,” *Electric Power Systems Research*, vol. 209, p. 108036.
   [Q1, IF=3.3]
   DOI: 10.1016/j.epsr.2022.108036
8. **S. Mohammadi**, M. Ojaghi, A. Jalilvand, Q. Shafiee (2021). “A Pilot-based Unit Protection Scheme for Meshed Microgrids using Apparent Resistance Estimation,” *International Journal of Electrical Power & Energy Systems*, vol. 126, p. 106564.
   [Q1, IF=5]
   DOI: 10.1016/j.ijepes.2020.106564

- **Conference Papers**

1. Q.M Hoang, **S. Mohammadi**, P. L. Nguyen, W. Su, V.H. Bui (2026). “Adaptive Grid-Mode-Aware Hybrid Energy Storage Control for AI Data Center Oscillation Mitigation”, Submitted, 2027 IEEE Power & Energy Society General Meeting (PESGM).
   DOI: 10.48550/arXiv.2611.05939
2. M.C. Wada, **S. Mohammadi**, V.H. Bui, W. Su (2026). “Transformer-guided Variable Projection for Phasor and Fault-Time Estimation Under DDC Offset”, Submitted, 2027 IEEE Power & Energy Society General Meeting (PESGM).
   DOI: 10.48550/arXiv.2611.03416
3. **S. Mohammadi**, Q.M Hoang, V.H. Bui, W. Su (2026). “Grid-Mode-Aware AI Data Center Power Smoothing via Bayesian-Optimized Hybrid Energy Storage System”, 2027 IEEE Texas Power and Energy Conference (TPEC), Submitted.
   DOI: 10.48550/arXiv.2611.03436

4. **S. Mohammadi**, W. Su (2026). “SymbolicPhasor: Power System Phasor Estimation via Deep Symbolic Regression”, 58th North American Power Symposium (NAPS), Accepted.
   DOI: 10.48550/arXiv.2608.08552
5. **S. Mohammadi**, W. Wang, M. Wada, R. Haghighi, A. Hassan, H. Liu, A. Bhatnagar, A. Chen, W. Su (2026) “Grid Integration of AI Data Centers: A Brief Review of Energy Storage Systems Solutions,” 2nd International Workshop on AI for Critical National Infrastructure, Paphos, Cyprus, May 26, 2026.
6. **S. Mohammadi**, V. Bui, W. Su (2025). “An Efficient Voltage-Based Topology Recovery Method for Distribution Networks”, 57th North American Power Symposium (NAPS), Hartford, Connecticut, USA, October 26-28, 2025.
   DOI: 10.1109/NAPS66256.2025.11272327
7. **S. Mohammadi**, A. Hassan, R. Haghighi, V. Bui, W. Su (2025). “Large Language Models for Solving Economic Dispatch”, 2025 IEEE Energy Conversion Congress and Exposition (ECCE), Philadelphia, Pennsylvania, USA, October 19-23, 2025.
   DOI: 10.1109/ECCE58356.2025.11259643
8. **S. Mohammadi**, V. Bui, W. Su (2025). “A Novel Topology Recovery Method for Low Voltage Distribution Networks”, 2025 IEEE Power & Energy Society General Meeting (GM), Austin, TX, USA, July 27–31, 2025.
   DOI: 10.1109/PESGM52009.2025.11225097
9. **S. Mohammadi**, R. Haghighi, A. Hassan, V. Bui, M. Wang, W. Su (2024). “Fast Accurate Phasor Estimation in Less than One Cycle using Neural Networks” 2024 IEEE 18th International Conference on Control & Automation (ICCA), Reykjavík, Iceland.
   DOI: 10.1109/ICCA62789.2024.10591924
10. V. Bui, **S. Mohammadi**, W. Su (2024). “Optimal Operation of Microgrid Through Loss-Guided Neural Network-Based Approach” 5th Technology Innovation Management and Engineering Science International Conference (TIMES-iCON2024) in Bangkok, Thailand.
    DOI: 10.1109/TIMES-iCON61890.2024.1063072
11. V. Tahsini, M. Ojaghi, K. Mazlumi, **S. Mohammadi** (2019). “A Novel Directional Relaying Scheme Using Superimposed Impedance Approach.” Paper presented in 2019 International Conference on Protection and Automation of Power System (IPAPS2019), Sharif University of Technology, Tehran, Iran.
    DOI: 10.1109/IPAPS.2019.8642057
12. **S. Mohammadi**, M. Ojaghi, A. Jalilvand, Q. Shafiee (2019). “Optimal Robust Control of LCL-type Grid-Connected Voltage Source Inverters against Grid Impedance Fluctuations.” Paper presented in 10th Annual International Power Electronics, Drive Systems and Technologies Conference (PEDSTC2019), Shiraz University, Shiraz, Iran.
    DOI: 10.1109/PEDSTC.2019.8697514
13. **S. Mohammadi**, M. Ojaghi, V. Tahsini (2018). “A Novel Unit Protection Scheme for Direct Current Power Systems.” Paper presented in smart grid conference 2018 (SGC2018), University of Kurdistan, Sanandaj, Iran.
    DOI: 10.1109/SGC.2018.8777837
14. **S. Mohammadi**, M. Ojaghi, A. Jalilvand, Q. Shafiee (2018). “Coordinated Control of Wind Turbines and Stabilizer Components for Effective Frequency Control of Multi-Area Power Systems in the presence of Physical Constraints. (Text in Farsi)” Paper presented in 12th International Energy Conference, Niroo Research Institute, Tehran, Iran.

Awards and Achievements

- EXP+ Student Conference Presentation Grant to attend 58th North American Power Symposium (NAPS) 2026
- EXP+ Student Independent Research Grant 2025-26 to work on Deep Symbolic Regression (DSR) for Fault Current Phasor Estimation in Power Grids.
- Student Travel Award to attend the 57th North American Power Symposium (NAPS) 2025
- EXP+ Student Conference Presentation Grant to attend 57th North American Power Symposium (NAPS) 2025
- CECS Doctoral Student Conference Travel Grant to attend the 2025 IEEE Energy Conversion Conference and Expo (ECCE)
- CECS Doctoral Student Conference Travel Grant to attend the 2025 IEEE Power and Energy Society General Meeting (PESGM)
- PhD Degree Scholarship, Fully Funded, University of Michigan-Dearborn

Research Experience

Graduate Student Research Assistant, Department of Electrical & Computer Engineering,
University of Michigan-Dearborn, Aug 2023 - now
Working on topology estimation of low voltage distribution networks.

- Two novel methods proposed for topology recovery in low voltage distribution networks using only smart meter data.
- Hierarchical clustering of incremental voltage measurements can reveal the topology of distribution network with high accuracy.
- Investigating physics-informed neural networks for solving optimal power flow.
- A label-free neural network is trained for DC optimal power flow with high accuracy comparing to ground truth obtained via analytical solution.

Graduate MSc student, Department of Electrical Engineering, University of Zanjan, 2021
Proposing a novel method for protecting meshed microgrids.

- A pilot based unit protection method is proposed based on apparent resistance estimation of transmission lines.
- The efficiency of method is evaluated for meshed microgrids in both grid-connected and islanded modes under different contingencies.

Teaching Experience

Graduate Student Instructor, University of Michigan-Dearborn, 2023-now
Courses: ECE 305, ECE 311, ECE 385, ECE 485, ECE 5831

- Teaching lab sessions for ECE 305 and ECE 311
- Grading homework, exams, and projects

Teaching Assistant, University of Zanjan, 2018
Course: Electric Machines II

- Solving different problems and discussing challenging topics in three phase inductive electric machines and single phase transformers.
- Evaluating BSc students via quiz tests in class.

Technical Skills

- **Programming & Tools**: Python (NumPy, PyTorch, Pandas), MATLAB/Simulink, PowerWorld, PSCAD, Pspice, LaTeX/Overleaf
- **Power Systems**: OPF, distribution grid modeling, Y-bus estimation, microgrid protection, state estimation
- **Machine Learning**: Neural Networks, PINNs, surrogate models, clustering

Memberships & Academic Activities

Graduate Student Member, IEEE, 2023 - now

- **Reviewer for**: IEEE Transactions on Smart Grid, IEEE Transactions on Power Systems, IEEE Power Engineering Letters, International Journal of Electrical Power & Energy Systems, IEEE Transactions on Industrial Informatics, IEEE Transactions on Industrial Electronics, IEEE Transactions on Control of Network Systems, NAPS 2026 conference, IECON 2026 conference, IEEE ECCE 2025 conference

Languages

Kurdish Native
Farsi Bilingual Proficiency
English Professional Working Proficiency
Arabic Elementary Proficiency

References

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