

Rasoul Narimani

Assistant Professor
College of Engineering and Computer Science
Arkansas State University

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Current Position

Assistant Professor, College of Engineering and Computer Science, **Arkansas State University**.

Education

Texas A&M University

2019-2021 Postdoctoral Scholar

- Supervisor: Dr. Kate Davis

Missouri University of Science and Technology

2014-2019 Ph.D. Electrical Engineering

- **Dissertation:** Strengthening QC relaxations of optimal power flow problems by exploiting various coordinate changes
- **Supervisor:** Dr. Mariesa L. Crow
- **Co-advisor:** Dr. Daniel K. Molzahn (Georgia Institute of Technology)

Shiraz University of Technology

2009-2011 M.Sc. Electrical Engineering (Electric Power Systems) (First Rank)

Razi University,

2004-2008 B.Sc. Electrical Engineering

Research Interests

- Power system operation and Control
- Renewable Energy Resources, Smart Grids
- Cyber Security of Cyber-Physical systems
- Smart Grid, Demand Side Management, Demand Charge Management
- Complex Network Theory
- Convex optimization
- Mathematical programming

Patents

1. Babak Asghari, **M.R. Narimani**, Ratnesh Sharma, “Method for operation of energy storage systems to reduce demand charges and increase photovoltaic (PV) utilization”, US Patent App.16006239.
2. Babak Asghari, Ratnesh Sharma, **M.R. Narimani**, “Optimal sizing of energy storage units in demand charge management and PV utilization applications”, US Patent App. 15992955.

Preprints

1. **M.R. Narimani**, D.K. Molzahn, K. Davis, and M.L. Crow, *Tight Linear Envelopes for QC Relaxations*.
2. **M.R. Narimani**, D.K. Molzahn, O. Boyaci, and K. Davis, *Assessing the Impact of Contingencies on the Feasible Space of the Optimal Power Flow*.
3. **M.R. Narimani**, D.K. Molzahn, and K. Davis, *Checking the feasibility of transitioning between two feasible states in a power system*.
4. O. Boyaci, **M.R. Narimani**, and K. Davis, *Spatio-Temporal Failure Propagation in Cyber-Physical Power Systems*.
5. O. Boyaci, **M.R. Narimani**, and K. Davis, *Adaptive Modeling of Cyber-Physical PowerSystems for Cascading Failure Analysis*.
6. **M.R. Narimani**, O. Boyaci, D.K. Molzahn, and K. Davis, *Create Challenging Test Cases for ACOPF studies via Convex Relaxation and Machine Learning Techniques*.
7. A. Foster, H. Huang, **M.R. Narimani**, L. Homiller, K. Davis, and A. Layton, *Ecological Uniqueness Measures for Identifying Critical Power Grid Components*.

Journal Papers

1. O. Boyaci, **M.R. Narimani**, K. Davis, M. Ismail, T.J. Overbye, E. Serpedin, Joint Detection and Localization of Stealth False Data Injection Attacks in Smart Grids using Graph Neural Networks, IEEE Transaction on Smart Grid (2021).
2. **M.R. Narimani**, H. Huang, A. Umunnakwe, Z. Mao, A. Sahu, S. Zonouz, and K.R. Davis, *Generalized contingency analysis based on graph theory and line outage distribution factor*. IEEE System Journal (2021).
3. A. Umunnakwe, A. Sahu, **M.R. Narimani**, and K. Davis. *Determining critical nodes towards cyber-physical contingency planning in Power System Networks*. IET Cyber-Physical Systems (2021).
4. O. Boyaci, A. Umunnakwe, A. Sahu, **M.R. Narimani**, M. Ismail, K. Davis, E. Serpedin, Graph Neural Networks Based Detection of Stealth False Data Injection Attacks in Smart Grids, IEEE System Journal (2021).
5. M. Zare, **M.R. Narimani**, R. Azizipanah, V. Terzija, Reserve constrained dynamic economic dispatch in multi-area power systems: An improved fireworks algorithm, International Journal of Electrical Power & Energy Systems (2021)
6. **M.R. Narimani**, D.K. Molzahn, and M.L. Crow, *Tightening QC Relaxations of AC Optimal Power Flow Problems via Complex Per Unit Normalization*, Transaction on Power Systems (2020).
7. A. Azizivahed, **M.R. Narimani**, *An efficient hybrid approach to solve bi-objective multi-area dynamic economic emission dispatch problem*, EPCS (2020).
8. H. Narimani, A. Azizivahed, E. Naderi, M. Fathi, **M.R. Narimani**, *A practical approach for reliability-oriented multi-objective unit commitment problem*, Applied Soft Computing (2019).
9. **M.R. Narimani**, J.Y. Joo, and M. L. Crow, *Multi-Objective Dynamic Economic Dispatch with Demand Side Management of Residential Loads and Electric Vehicles*”, Energies (2017).
10. **M.R. Narimani**, A. AziziVahed, *An enhanced gravitational search algorithm for multi-objective distribution feeder reconfiguration considering reliability, loss and operation cost*, IET Generation, Transmission & Distribution (2014).

11. **M.R. Narimani**, R. Azizipanah, *A Novel approach to multi-objective optimal power flow by a new hybrid optimization algorithm considering generator constraints and multi-fuel type*, Energy (2013).
12. T. Niknam, **M.R. Narimani** J. Aghaei, S. Tabatabaei M. Nayeripour, *Modified Honeybee Mating Optimisation to solve dynamic optimal power flow considering generator constraints*, IET Generation, Transmission & Distribution (2011).
13. T. Niknam, **M.R. Narimani**, J. Aghaie, R. Azizipanah. *Improved particle swarm optimization for multi-objective optimal power flow considering cost, loss, emission and voltage stability index*, IET Generation, Transmission & Distribution (2012).
14. M. Nayeripour, **M.R. Narimani**, *Design of sliding mode controller for UPFC to improve power oscillation damping*, Applied Soft Computing Journal (2011).
15. T. Niknam, **M. R. Narimani**, M. Jabbari, A.R. Malekpour, *A modified shuffle frog leaping algorithm for multi-objective optimal power flow*. Energy (2011).
16. T. Niknam, **M.R. Narimani**, *Dynamic optimal power flow using hybrid PSO and SA*, International Transactions on Electrical Energy Systems (2013).
17. T. Niknam, **M.R. Narimani**, R. Azizipanah, *A new hybrid algorithm for optimal power flow considering prohibited zones and valve point effect*, Energy Conversion and Management (2012).
18. T. Niknam, R. Azizipanah, **M.R. Narimani**, *An efficient scenario-based stochastic programming framework for multi-objective optimal micro-grid operation*, Applied Energy (2012).
19. T. Niknam, **M.R. Narimani**, E. Farjah, B. Bahmani-Firouzi, *A New Evolutionary Optimization Algorithm for Optimal Power Flow in a Power System Involving Unified Power Flow Controller*, Energy EducSci Tech-A (2012).
20. M. Nayeripour, **M.R. Narimani**, and T. Niknam, *Application of Modified Shuffled Frog Leaping Algorithm on Optimal Power Flow Incorporating Unified Power Flow Controller*, International Journal of Modeling and Optimization (2011).
21. T. Niknam, **M.R. Narimani**, *A Multi-objective Fuzzy Adaptive PSO Algorithm for Location of Automatic Voltage Regulators in Radial Distribution Networks*, International Journal of Control, Automation, and Systems (2012).
22. T. Niknam, **M.R. Narimani**, R. Azizipanah, *Multi-objective Optimal Reactive Power Dispatch and Voltage Control: A New Opposition-based Self-Adaptive Modified Gravitational Search Algorithm*, IEEE systems journal (2013).
23. T. Niknam, R. Azizipanah, **M.R. Narimani**, *A new multi objective optimization approach for location of automatic voltage regulators in distribution systems*, Engineering Applications of Artificial Intelligence (2012).
24. T. Niknam, R. Azizipanah, **M.R. Narimani**, *Reserve constrained dynamic optimal power flow subject to valve-point effects, prohibited zones and multi-fuel constraints*, Energy (2012).
25. **M.R. Narimani**, *A New Modified Shuffle Frog Leaping Algorithm for Non-Smooth Economic Dispatch*, World Applied Sciences Journal, 12, (2011), 2011.
26. R. Azizipanah, **M.R. Narimani**, and T. Niknam, *Modified shuffled frog leaping algorithm for multi-objective optimal power flow with FACTS devices*, Journal of Intelligent & Fuzzy Systems (2013).
27. E. Mahboubi, **M.R. Narimani**, *Multi-Objective Distribution feeder reconfiguration to improve transient stability, and minimize power loss and operation cost using an enhanced evolutionary algorithm at the presence of distributed generations*, International Journal of Electrical Power & Energy Systems, (2016).
28. A. Azizivahed, E. Naderi, **M.R. Narimani**, *A hybrid evolutionary algorithm for secure multi-objective distribution feeder reconfiguration*, Energy (2017).

29. E. Naderi, A. Azizivahed, **M.R. Narimani**, *A comprehensive study of practical economic dispatch problems by a new hybrid evolutionary algorithm*, Applied Soft Computing (2017).
30. A. Azizivahed, E. Naderi, **M.R. Narimani**, *A New Bi-Objective Approach to Energy Management in Distribution Networks with Energy Storage Systems*, IEEE Transactions on Sustainable Energy (2018).
31. E. Naderi, **M.R. Narimani**, *A novel fuzzy adaptive configuration of PSO to solve large-scale optimal reactive power dispatch*, Applied Soft Computing (2017).
32. A. Azizivahed, E. Naderi, **M.R. Narimani**, *Multi-objective dynamic distribution feeder reconfiguration in automated distribution systems*, Energy (2018).
33. H. Narimani, A. Azizivahed, **M.R. Narimani**, *A Multi-Objective Framework for Multi-Area Economic Emission Dispatch*, Energy, 2018, 154, 126-142.

Conference Papers

1. H. Huang, V. Panyam, **M.R. Narimani**, A. Layton, K. Davis, *Mixed-Integer Optimization for Bio-Inspired Robust Power Network Design*, NAPS (2021).
2. A. Foster, H. Huang, **M.R. Narimani**, L. Homiller, K. Davis, A. Layton, *Ecological Uniqueness for Understanding Line Importance in Power Grids*, TPEC, 2021.
3. H. Huang, Z. Mao, **M.R. Narimani**, and K.R. Davis, *Toward Efficient Wide-Area Identification of Multiple Element Contingencies in Power Systems*. ISGT (2021).
4. **M.R. Narimani**, D. K. Molzahn, D. Wu, and M. L. Crow, *Empirical Investigation of Non-Convexities in Optimal Power Flow Problems*, ACC (2018).
5. **M.R. Narimani**, D.K. Molzahn, and M.L. Crow, *Improving QC Relaxations of OPF Problems via Voltage Magnitude Differences and Envelopes for Trilinear Monomials*, Power System Computation Conference (2018).
6. **M.R. Narimani**, D.K. Molzahn, H. Nagarajan, and M. L. Crow, *Comparison of Various Trilinear Monomial Envelopes for Convex Relaxations of Optimal Power Flow Problems*, GlobalSIP (2018).
7. **M.R. Narimani**, B. Asghari, R. Sharma, *Optimal Sizing and Operation of Energy Storage for Demand Charge Management and PV Utilization*, IEEE/PES Transmission and Distribution Conference and Exposition (2018).
8. **M.R. Narimani**, B. Asghari, R. Sharma, *Energy Storage Control Methods for Demand Charge Reduction and PV Utilization Improvement*, Asia-Pacific Power and Energy Engineering Conference (2017).
9. **M.R. Narimani**, P. Nauert, J.Y. Joo, M.L. Crow, *Reliability Assessment of Power System in the Presence of Demand Side Management*, PECO (2016).
10. **M.R. Narimani**, J.Y. Joo, M.L. Crow, *The Effect of Demand Response on Distribution System Operation*, Power and Energy Conference at Illinois (2015).
11. **M.R. Narimani**, J.Y. Joo, M.L. Crow, *Dynamic Economic Dispatch with Demand Side Management of Individual Residential Loads*, NAPS (2015).

Invited Talks

1. **M.R. Narimani**, "Dynamic Economic Dispatch with Demand Side Management of Individual Residential Loads," Missouri S&T, March 2016.
2. **M.R. Narimani**, "Strengthening QC Relaxations of Optimal Power Flow Problems by Exploiting Various Coordinate Changes," UW, June 2018.
3. **M.R. Narimani**, "Tightening the QC Relaxations of Optimal Power Flow Problems," Texas A&M University, February 2020.

4. **M.R. Narimani**, “Empirical Investigation of Non-Convexities in Optimal Power Flow Problems,” Grainger Award banquet, June 2020.
5. **M.R. Narimani**, “Strengthening QC Relaxations of Optimal Power Flow Problems,” Georgia Tech, August 2020.

Honors, Awards

- **First rank among M.Sc. students**, Shiraz University of Technology, Iran.
- Awarded by the "**Exceptional Talents Center**", Shiraz University of Technology, Iran.
- Recipient of **GAAN Fellowship**, Missouri S&T, 2018.
- Recipient of **Grainger Award**, Missouri S&T, 2020.

Memberships in Professional Organization

1. Institute of Electrical and Electronics Engineers
2. IEEE Power and Energy Society
3. IEEE Power Electronics Society
4. IEEE Industrial Application Society

Grants

- **CRII: CPS: Leveraging Convex Relaxation Techniques to Improve Power System Surveillance**, National Science Foundation, (PI) (Status: Pending, submission date: 09/20/2021).

Professional Services

1. Chapter Chair of Student branch of IEEE Industrial Application Society, Missouri University of Science and Technology (2016-2019)
2. Panel member for review of National Science Foundation (NSF) grant proposals
3. Reviewer for IEEE Transaction on Power Systems
4. Reviewer for IEEE Transaction on Smart Grid
5. Reviewer for IEEE Transaction on Sustainable Energy
6. Reviewer for IEEE Transaction on Industrial Informatics
7. Reviewer for IET Generation, Transmission & Distribution
8. Reviewer for Electric Power Components and Systems
9. Reviewer for International Journal of Electrical Power and Energy Systems
10. Reviewer for Energy Conversion and Management
11. Reviewer for Applied Soft Computing
12. Reviewer for Energy
13. Reviewer for Applied Energy
14. Reviewer for IEEE Power system computation conference
15. Reviewer for IEEE PES Transmission & Distribution conference
16. Reviewer for IEEE Texas Power and Energy conference

Teaching Experiences

Arkansas State University
Instructor for Power System

Jonesboro, Arkansas
Aug 2021–present

Arkansas State University
Instructor for Embedded System

Jonesboro, Arkansas
Aug 2021–present

Missouri University of Science and Technology
Instructor for Circuit I

Rolla, Missouri
Jun–Aug 2016

Missouri University of Science and Technology
Instructor for Electromechanics

Rolla, Missouri
Aug–Dec 2019

Shiraz University of Technology
Teaching assistant for Electrical Machinery I, II
Teaching assistant for Electrical Machinery II

Shiraz, IRAN
Sep–Dec 2009
Sep–Dec 2010

Industry Experiences

NEC Labs America
Energy Management Group

San Jose, California
Jan–May2017

Computer Skills

Programming Languages: C++, Julia, Python, MATLAB and Simulink
Specialized Software: GAMS, PowerWorld, PowerModels

Languages

English: Fluent
Persian: Native
Kurdish: Mother Tongue