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Summary and Highlights

- Fellow of Institution of Engineering and Technology (IET). Associate professor in the Department of Electrical and Computer Engineering and Affiliated Faculty in the Department of Economics at Missouri University of Science and Technology in Rolla Missouri. Worked as a principal engineer and project manager at the Midcontinent Independent System Operator (MISO) in St.Paul Minnesota from 2009 to 2017, and an assistant professor at Missouri University of Science and Technology from 2017 to 2023.
- Research interests include computation, optimization and economics in power system operation, control and planning; High performance computing and its application in power systems; Electricity market simulation, evaluation and design; Power system and electricity market cyber security.
- Research has been funded by DARPA, National Science Foundation, Department of Energy, DOD and industry. Total research funding: $7.43M (shared credit: $3.73M).
- Published over 80 journal papers and 50 conference papers. One book translation published by Tsinghua University Press. Google Scholar total citations is 4690 and H-index is 33. One patent, one patent application, two invention disclosure, and one software disclosure. A contributor to “IEEE Power and Energy Technology Assessment and Roadmap” published in June 2024.
- Two best conference paper awards in flagship IEEE Power and Energy Society (PES) General Meetings (2020 and 2021). Faculty advisor to a PhD student for his second prize in the Student Poster Contest in 2021 IEEE PES General Meeting, and first place in 2022 Missouri S&T Graduate Poster Contest.
- Winner of all four phases of Hydropower Operations Optimization (H2Os) Prize, funded by the U.S. Department of Energy’s Water Power Technologies Office (WPTO) in 2022-2023. Winner of phase one of Digitizing Utilities Prize, funded by the U.S. Department of Energy’s Office of Electricity.
- Associate Editor of IEEE Transactions on Power Systems, IEEE Power Engineering Letters, IEEE Transactions on Energy Markets, Policy and Regulation. Guest Editor-in-chief of IEEE Transactions on Smart Grid Special Section on Local and Distributed Electricity Markets. Past Editor of IEEE Transactions on Sustainable Energy, Journal of Modern Power System and Clean Energy. Panelist and reviewer for NSF and DOE.
- Founding chair of IEEE Task Force on Advanced Methods for Computational Intensive Power System Planning Applications. Chair of IEEE PES Bulk Power System Planning Subcommittee (BPSP), and Vice-chair of IEEE PES Power System Economics Subcommittee (PSE). IEEE PSOPE TCPC.
- Recipient of 2024 National Science Foundation CAREER Award, and 2018 Defense Advanced Research Projects Agency (DARPA) Young Faculty Award (YFA). Recipient of 2024 Missouri S&T Faculty Research Award, 2022 IEEE St.Louis Section Outstanding Research and Scholarship Award, 2021-2022 Dean's Scholar Award, 2020 University of Missouri System President’s Award for Career Excellence - Early Career, 2020 Missouri S&T Faculty Excellence Award, 2012 IEEE Twin Cities Section Outstanding Engineer Award, and 2012 and 2015 MISO Outstanding Achievement Award.
- Graduated three PhD students, one co-advised PhD student and 1 MS student. Currently advising 4 PhD students, and co-advising 2 PhD students. Supervised 2 post-doctoral fellows.

Education

Ph.D. in Electrical Engineering *Jan 2006-*
***University of Tennessee**, Knoxville, TN.* *Dec 2009*

M.S. in Electrical Engineering *Sep 2000-*
***Southeast University**, Nanjing, China.* *Apr 2003*

B.S. in Electrical Engineering *Sep 1996-*
***Southeast University**, Nanjing, China.* *June 2000*

Minor in Mathematical Modeling and Computer Application *Sep 1996-*
***Southeast University**, Nanjing, China.* *June 2000*

Research Projects

Enhancing Hydropower Market Participation by Leveraging Advanced Modeling, Optimization, and Water Management for Increased Flexibility (Under Award Negotiation)

PI, Department of Energy (WPTO), $750,000, 07/2025-06/2027

CAREER: A Multi-faceted Framework to Enable Computationally Efficient Evaluation and Automatic Design for Large-scale Economics-driven Transmission Planning

PI, National Science Foundation CAREER Award, $500,000, 09/2024-08/2029

Model-Free Adaptive Control (MFAC) for Autonomous and Resilient Microgrids
PI (Missouri S&T), DOD ESTCP, $700,000, 05/01/2020-04/08/2024 ($300,000 to Missouri S&T)

High Renewables Future Study

PI (Missouri S&T), Eastern Interconnection Planning Collaborative (EIPC), $226,110, 6/23/2020-8/31/2022 ($165,349 to Missouri S&T)

Modeling and Optimizing Pumped Storage in a Multi-stage Large Scale Electricity Market under Portfolio Evolution

PI, Department of Energy (WPTO), $999,554, 8/1/2019-8/31/2021

Enabling Extreme Fast Charging with Energy Storage

Co-PI, Department of Energy (VTO), $2,915,377, 10/01/2018-9/30/2023

CPS: TTP Option: Medium: Collaborative Research: Trusted CPS from Untrusted Components

Co-PI, National Science Foundation, $962,695, 10/01/2018-09/30/2022
Agent-based Anti-gaming Platform for Wholesale Electricity Market Monitoring and Rule Design Using Big Data Analytics and Computational Intelligence

PI, DARPA Young Faculty Award, $377,796, 07/02/2018-07/01/2021

Research Interests

Advanced Techniques for Large-scale Power System Operation and Long-Range Economic Planning

- Interval Analysis of Power Flow and Optimal Power Flow
- Probabilistic LMP forecasting

- Analytical analysis of power system steady state changes in response to large variations in system parameters including wind/solar/load
- Improve computational efficiency in transmission planning; system reduction; GPU-based parallel computing
- Develop new transmission system design framework, planning philosophy, and cost allocation
- Coordinated generation and transmission planning
- Grid integration of Distributed Energy Resources and Electric Vehicles

Electricity Market Modeling, Monitoring and Simulation For Evaluating Design, Investment, Policy and Technologies

- Next-generation of electricity market simulation platform for evaluating generation/transmission investment, new generation technologies and energy policies under a range of uncertainties
- Support multiple markets and their interactions; market participant strategy simulation
- Market player strategy development and recognition; Market rule analysis and remedial plan
- Agent-based modeling and simulation; big data analytics; machine deep-learning; high performance computing

Cyber-Physical Impact on Power Systems and Financial Impact on Electricity Markets

- Interaction between physical power systems and financial electricity markets
- Static and dynamic state estimation
- Cyber attacks and counter measures
- Co-simulation of electricity market, transmission, distribution and communication systems

Improve Power System Operational Efficiency and Utility Asset Management Through Advanced Sensing Technology

- Improved system observability
- Digitizing power systems
- Application of fiber-optical sensors
- Asset health monitoring, diagnostics and prediction

Work Experience

Visiting Professor, *Princeton University, Princeton, NJ USA* *2024.9-present*

Consultant, *Five Dimensions Energy, Princeton, NJ USA*

Affiliated Faculty, Economics Department, *Missouri University of Science and Technology, Rolla, MO USA* *2024.9-present*

Associate Professor, Electrical and Computer Engineering Department, *Missouri University of Science and Technology, Rolla, MO USA* *2023.9-present*

Assistant Professor, Electrical and Computer Engineering Department, *Missouri University of Science and Technology, Rolla, MO USA* *2017.9-2023.8*

- Research interests

  *Computation, optimization and economics in power system operation and planning

  *High performance computing and its application in power systems

  *Electricity market simulation, evaluation and design

  *Power system and electricity market cyber security

  *Grid integration of distributed energy resources

- Teaching

  *Spring 2018, Fall 2018, Spring 2019, Fall 2021, Fall 2023: EE 3540 Power System Design & Analysis

  *Fall 2019, Spring 2021, Spring 2022, Spring 2023: EE 5540 Power System Engineering

  *Spring 2020: EE 5550 Electric Power Quality

  *Fall 2020, Fall 2022: EE 6580 Power System Operation

Principal Engineer, Economic Studies, *Midcontinent Independent System Operator (MISO), St.Paul/Eagan, MN USA* *2009.9-2017.8*

- Use industrial-strength power system and electricity market simulation/analysis tools including POWERBASE, PROMOD and PSS/E to develop business cases and perform economic benefit studies for transmission upgrade projects/portfolios (which typically costs several hundred million to several billion dollars) for various initiatives in Midwest ISO which supports the reliable delivery of electricity in 12 U.S. states and the Canadian province of Manitoba.
- Project manager of 2013 MISO Market Efficiency Planning Study – Midwest Region, and 2013 PROMOD Benchmark Study. Participated and responsible for various regional and inter-regional planning efforts including Candidate Multi-Value Project (MVP) Portfolio Study, MISO Target Appendix A Economic Benefit Analysis, Joint MISO-PJM Planning Study, Regional Transmission Overlay Study, etc.
- Research on new optimization method, process and framework for economic transmission planning.
- Research on methodology for transmission usage quantification and cost allocation of transmission upgrade.
- Noteworthy Accomplishments:

  * A main contributor in identifying and justifying Petersburg-Wheatland-Breed 345 kV and Petersburg-Cato Tap-Duff 138 kV upgrade project, which was approved by MISO Board of Directors in 2012 to become the second MISO Market Efficiency Project.

  * Established a streamlined QA/QC process in quality control of the PROMOD Model Building process, for which received 2012 MISO Outstanding Performance Award.

  * Proposed and developed Estimated Potential Benefit (EPB) concept for congested flowgate ranking, and the concept has been adopted in 2013 MISO Transmission Expansion Planning process.

  * Proposed and developed Line Outage Distribution Factor (LODF)-based transmission issue grouping method and transmission solution screening method. The methods have been adopted in 2014 MISO Transmission Expansion Planning process.

  * Led a study team and successfully finished a highly challenging project "PROMOD Benchmark Study" in 2015. After intensive investigation and numerous testing and refinement, the gap between simulation model and historical actuals was significantly reduced from 72% to 24%, for which received 2015 MISO Outstanding Performance Award.

  * As the project manager for MTEP16 Market Congestion Planning Study, led a study team to evaluate a large number of transmission projects and successfully justified and recommended a Market Efficiency Project, 38.5 miles Huntley to Wilmarth 345 kV transmission line project with an estimated cost of $80.9 million, for MISO Board of Director's approval. The project was approved by MISO Board of Directors in December 2016.

* Conducted a first-ever Eastern Interconnection wide Transmission Utilization Analysis (Loop Flow Analysis) for an 8760-hour simulation time horizon.

Project Lead and Software Designer, *Shenzhen Cermate Technologies Inc, China* *2004.5-2005.7*

- Led a 4-person software development team in researching and developing a Human Machine Interface (HMI) firmware and a PC software for industrial touch screens.
- Successfully developed a firmware which ran on uC/OS-II (a real-time embedded operating system) and HMI PC software "Panel Designer 2" which allows the users to customize control process, translate the process into command files and transfer the files into touch screens to be executed by the firmware.

Software R&D Engineer, *ZTE Corporation, China* *2003.4-2004.5*

- A team member of the R&D group from Nanjing, Shenzhen (China) and San Diego (USA) divisions of ZTE Corporation. Participated in developing ZTE CDMA2000 1X Mobile Communication System and GoTa (Global Open Trunking Architecture) system, which is the world´s first CDMA2000-based new-generation digital trunking system.
- Designed and developed a highly reusable and expandable software architecture for mobile phone user profile and account management system which was considered to be included in ZTE Standard Template Library.

Professional Service & Contribution

Editor

- Associate Editor, IET Energy Internet, since 2024
- Associate Editor, IEEE Transactions on Energy Markets, Policy and Regulation, since 2022
- Guest Editor-in-chief, IEEE Transactions on Smart Grid, 2021 (Special section on Local and Distribution Electricity Markets)
- Associate Editor, IEEE Transactions on Power Systems, since 2021
- Guest Associate Editor, International Journal of Electrical Power and Energy Systems, 2020 (Special issue on Integrated Local Energy Systems)
- Associate Editor, Journal of Modern Power System and Clean Energy, 2019
- Associate Editor, IEEE Power Engineering Letters, since 2017
- Associate Editor of IEEE Transactions on Sustainable Energy, 2017-2020
- Associate Editor of International Journal of Power and Energy Systems, 2011-2016

Journal Reviewer

- Nature Reviews Electrical Engineering, since 2024
- Journal of Cleaner Production, since 2022
- Artificial Intelligence Review, since 2022
- Energy Economics, since 2021
- Energy Technology, since 2021
- Energy Reports, since 2021
- IEEE Transactions on Emerging Topics in Computational Intelligence, since 2021
- Energies, 2020
- International Journal of Disaster Risk Reduction, 2020
- Measurement, 2020
- IEEE Transactions on Power Delivery, 2020
- Energy and Buildings, 2019
- IEEE Access, 2019
- International Journal of Computational Fluid Dynamics, 2019
- Applied Mathematical Modelling, since 2018
- IET Renewable Power Generation, since 2018
- Transactions on Energy Conversion, since 2018

- Electric Power Components and Systems Journal, since 2016
- Journal of Energy Storage, since 2016
- Soft Computing, since 2016
- IET Generation, Transmission & Distribution, since 2016
- Applied Energy, since 2016
- IEEE Power & Energy Society Letters, since 2012
- International Journal of Electrical Power and Energy Systems, since 2012
- Journal of Energy Engineering, since 2011
- IEEE Transactions on Sustainable Energy, since 2011
- IEEE Transactions on Smart Grid, since 2011
- IEEE Transactions on Power Systems, since 2009
- International Journal of Power and Energy Systems, since 2009

Conference Reviewer /Committee

- Program Committee Member, 2019 IEEE International Conference on Big Data (IEEE BigData 2019), Los Angeles, CA, USA
- Technical Program Committee, 2016 IEEE PES Innovative Smart Grid Technologies Conference (ISGT)
- IEEE PES General Meeting, since 2012
- IEEE PES Innovative Smart Grid Technologies Conference (ISGT), since 2014
- 2014 IEEE PES Innovative Smart Grid Technologies Conference (ISGT) Europe, Istanbul
- Technical Program Committee, 2012 IEEE International Power Engineering and Optimization Conference
- 2012, 2014, 2018 IEEE PES Transmission and Distribution Conference & Exposition
- 25th Annual IEEE Applied Power Electronics Conference & Exposition
- 2010 IEEE International Energy Conference

Other Reviewer Service

- Reviewer, Department of Energy Office of Science, 2019, 2020, 2021
- Panelist, National Science Foundation (NSF) Review Panel, 2018
- Technical Review Committee member, DOE Grid Modernization Laboratory Consortium (GMLC), 2016
- Advisory Board Member, Wayne State University Real-Time Energy Impact Project, 2014-2015

Professional Service - Academic

- IEEE PES Power System Economics Subcommittee, Secretary since 2020
- IEEE PES Bulk Power System Planning Subcommittee, Secretary, 2019; Vice-chair, 2021; Chair, 2023
- Co-Chair, Panel Session "Advances in Computational Methods and Technologies for Power System Planning ", 2021 IEEE PES General Meeting (virtual)
- Chair, Panel Session " Addressing Computational Challenges in Power System Planning ", 2020 IEEE PES General Meeting (virtual)
- Chair, Panel Session "Addressing Transmission Planning Challenges in Uncertainties and Computation", 2019 IEEE PES General Meeting, Atlanta, GA, USA
- Chair, Panel Session "Computational Challenges in Power System Planning", 2018 IEEE PES General Meeting, Portland, OR, USA
- Founding chair, IEEE Task Force on Advanced Methods for Computational Intensive Power System Planning Applications, 2017
- Member, IEEE Task Force on Real-time Contingency Analysis
- Chair, PSPI Panel Session "Economic Transmission Planning: Best Practices and Challenges", 2016 IEEE PES General Meeting, Boston, MA, USA
- Chair, PSPI Transactions Paper Session and NACPPA Panel Session, 2015 IEEE PES General Meeting, 2015
- Chair, Power System Dynamic Performance Committee Paper Session, 2012 IEEE PES Transmission and Distribution Conference & Exposition, 2012

Professional Service – Misc

- Mentor, Career Compass IEEE PES General Meeting Mentoring 2024 program
- IEEE Rolla Subsection, Secretary, 2018; Treasurer, 2019; Chair, 2020
- Academic Adviser, Ameren Accelerator Program, 2018
- VP of Events, North America Chinese Power Professional Association, 2013~2014
- Panelist, IEEE Admission and Advancement (A&A) Committee Senior Member Review Panel, 2014
- IEEE PES Scholarship Plus Review Committee Region 4, 2013, 2014
- IEEE Twin Cities PES Chapter officer for Membership Growth, 2013
- Judge, Student Poster Contest, 2012 IEEE PES Transmission and Distribution Conference & Exposition, 2012
- Judge, University of Minnesota's Undergraduate Poster Symposium, 2012
- IEEE Corporate Ambassador to MISO, 2012
- Volunteer, 2010 IEEE PES General Meeting, Minneapolis, USA, 2010

On-campus Service

- Lab Development, Missouri S&T ECE Department, since 2017
- Recruitment Committee, Missouri S&T ECE Department, since 2023
- Faculty Senate Standing Committee: Library and Learning Resources, Missouri S&T, since 2023

Contributions to Power System Education and Research Community

- Lead instructor of tutorial "Planning Beyond Reliability - Economics Driven Transmission Planning Under Market Environment: Fundamentals, Applications, Benchmark and Challenges" in 2021 IEEE Power and Energy Society General Meeting.
- Contributed source-codes of Continuation Power Flow (CPF) and State Estimation (SE) algorithms to the *MATLAB™ Power System Simulation Package* (MATPOWER) funded by PSERC and maintained at Cornell University.
- Contributed a modified PJM 5-bus system case to MATPOWER. Note that the case is not supposed to represent simplified PJM system. Rather, it is modified from a 5-bus system case from PJM Tutorial on Locational Marginal Price (LMP). The case has also been included in NESTA (The NICTA Energy System Test Case Archive) and has been included in The Data Repository for Power system Open models With Evolving Resources (DR POWER) project is funded by the ARPA-E Generating Realistic Information for the Development of Distribution and Transmission Algorithms (GRID DATA) Program to establish, curate, and evolve open-access power grid models and scenarios, collectively referred to as datasets. The 5-bus case may be assessed respectively at NESTA 5-bus case, and DR POWER 5-bus case.

Memberships & Affiliations

- IEEE Senior Member, since 2010
- Member of Sigma Xi - The Scientific Research Society, 2009
- Phi Kappa Phi Honor Society membership, 2007

Honors and Awards

- Faculty Research Award, Missouri S&T, 2024
- Fellow, Institution of Engineering and Technology (IET), 2024
- National Science Foundation CAREER Award, 2024
- 2022 ISC Distinguished Investigator Award, Missouri S&T Intelligent Systems Center (ISC), 2023
- IEEE Saint Louis Section Outstanding Research and Scholarship, 2022
- 2020-2021 Outstanding Teaching Commendation, Missouri S&T, 2021
- 2021-2022 Dean's Scholar Award, College of Engineering and Computing of Missouri S&T, 2021
- Faculty Excellence Award, Missouri S&T, 2020
- University of Missouri System President's Award for Career Excellence - Early Career, 2020

- Faculty External Recognition Award, Missouri S&T, 2019
- Research Acceleration Award, College of Engineering and Computing of Missouri S&T, 2019
- DARPA Young Faculty Award, 2018
- Missouri S&T Center for Advancing Faculty Excellence (CAFE) Travel Award, 2018
- NACPPA Outstanding Service Award, North America Chinese Power Professional Association (NACPPA), 2015
- MISO Outstanding Achievement Award, MISO, 2015
- MISO Outstanding Achievement Award, MISO, 2012
- IEEE Twin Cities Section Outstanding Engineer, IEEE, 2012
- Nominee for TAM Award, MISO, 2011

PhD Period:

- Chancellor's Honor---Extraordinary Professional Promise in 2009, UTK, 2009
- 2nd Prize in Student Poster Contest in 2009 IEEE PES Power System Conference and Exposition (PSCE), IEEE PES, 2009
- Travel Fund Award by UTK, 2008
- IEEE Travel Grant by IEEE Power and Energy Society, 2007~2008

MS Period:

- 2004' Excellent Graduate Thesis of Jiangsu Province, by *Department of Education of Jiangsu Province*, *China*, 2004
- Excellent Graduate Thesis Award, *Southeast University*, 2003
- (Team member of) Second prize award for Science and Technology Progress by Electric Power Company of Jiangsu Province, China in 2003
- Rockwell Scholarship, by *Rockwell Company, USA*, 2002
- NARI-Southeast University Thesis Fund, by *NARI Company, China*, 2002
- Second Class Graduate Student Fellowship, *Southeast University*, 2001

Undergraduate Period:

- Excellent Undergraduate Thesis Award, *Southeast University*, June 2000
- 2nd Prize for Electronic Circuit Design Contest of Southeast University, *Southeast University*, 1999
- 1st Prize for China National Undergraduate Mathematical Contest in Modeling, *Department of Education, China*, 1998
- 2nd Place for Computer Programming Skill Contest (C language) of Jiangsu Province, *Department of Education of Jiangsu Province, China*, 1998
- NARI Scholarship, by *NARI Company, China*, 1998
- First Class Fellowship & Excellent Student Scholarships, *Southeast University*, 1997~2000

Group Awards:

- Second prize award winner of the Phase Four competition of the Hydropower Operations Optimization (H2Os) Prize, which is funded by the U.S. Department of Energy's Water Power Technologies Office (WPTO), October 2023.
- Prize award winner of the Phase 1 competition of the Digitizing Utilities Prize, which is funded by the U.S. Department of Energy's Office of Electricity (OE).
- Runner up and prize award winner of the Phase Three competition of the Hydropower Operations Optimization (H2Os) Prize, which is funded by the U.S. Department of Energy's Water Power Technologies Office (WPTO), January 2023.
- Prize award winner of the Phase Two competition of the Hydropower Operations Optimization (H2Os) Prize, which is funded by the U.S. Department of Energy's Water Power Technologies Office (WPTO), September 2022.
- Prize award winner of the Phase One competition of the Hydropower Operations Optimization (H2Os) Prize, which is funded by the U.S. Department of Energy's Water Power Technologies Office (WPTO), July 2022.

- Best Conference Paper of 2021 IEEE PES General Meeting (top 10%): Waqas ur Rehman, Rui Bo, Hossein Mehdipourpicha, Jonathan Kimball, "Sizing Energy Storage System for Energy Arbitrage in Extreme Fast Charging Station", *2021 IEEE PES General Meeting*.
- Best Conference Paper of 2020 IEEE PES General Meeting (top 10%): Hossein Mehdipourpicha, Rui Bo, "Risk-constrained Bi-level Optimization for Virtual Bidder Bidding Strategy in Day-Ahead Electricity Markets", *2020 IEEE PES General Meeting*, Montreal Canada.

Faculty Advisor of Student Awards:

- Nicholas Mattli received the Grainger Power Engineering Student Award in May 2024.
- Waqas ur Rehman received 2022-2023 Dean's PhD Scholar Award from College of Engineering and Computing of Missouri University of Science and Technology.
- Oroghene (Snapps) Oboreh-Snapps received 2021-2022 Dean's Graduate Educator Awards from College of Engineering and Computing of Missouri University of Science and Technology.
- Waqas ur Rehman won the first place with $200 cash prize in the 2022 Missouri S&T Graduate Poster Contest, out of 28 contestants (poster title "Multi-layered Framework for Energy Management of Extreme Fast Charging Stations for Electric Vehicles").
- Waqas ur Rehman won the second prize in the Student Poster Contest in 2021 IEEE PES General Meeting (Based on this paper: Waqas ur Rehman, Rui Bo, Hossein Mehdipourpicha, Jonathan Kimball, "Sizing Energy Storage System for Energy Arbitrage in Extreme Fast Charging Station", 2021 IEEE PES General Meeting).

Advisees and Alumni

Current Students

- Mohammed Sleiman (PhD student)
- Ahmad Heidari (PhD student)
- Ehab Ur Rahman (PhD student)
- Haotian Chen (PhD student)
- Arnold Fernandes (Co-advised PhD student)
- Ronit Das (Co-advised PhD student)

Current Post-doc Fellow

Alumni

- Oroghene Oboreh-Snapps (Co-advised PhD. Summer 2024. Current Position: Lead Utility Analyst, Burns&McDonnell)
- Dr. Shah Fahad (Post-doc fellow). Current Position: Post-doc fellow, St.Thomas Center for Microgrid Research
- Nicholas Mattli (MS. Spring 2024). Current Position: Electrical Engineer, Gannett Fleming
- Waqas ur Rehman (Ph.D. Fall 2023. Expected). Current Position: Lead Engineer, Eaton Research Labs
- Jian Liu (Ph.D. Fall 2022). Current Position: Research Assistant Professor, Missouri S&T
- Hossein MehdipourPicha (Ph.D. Fall 2022). Current Position: Senior Congestion Analyst, American Electric Power
- Dr. Siyuan Wang (Post-doc fellow). Current Position: Energy Systems Engineer, Argonne National Lab

Patent and Patent Application

[1]. Jie Huang, **Rui Bo**, "REAL-TIME OVERHEAD POWER LINE SAG MONITORING", US Patent 11,150,083, October 19, 2021.

[2]. **Rui Bo**, "Method For Generating A Reduced Equivalent Model Of An Electric Power Network For SCED And SCUC Applications", filed on 7/9/2021, Provisional Patent Application Serial No. 63/220,160. Utility patent filed in July 2022.

[3]. Fangxing Li, Buxin She, Hantao Cui, **Rui Bo**, Oroghene Oboreh-Snapps, Haotian Chen, "A Microgrid Controller based on Time-Varying Gains using a Hybrid Approach Combining Model-Based Analysis and Data-Driven Implementation", invention disclosure, February 2022

[4]. Fangxing Li, Buxin She, Jinning Wang, Hantao Cui, **Rui Bo**, "A Decentralized and Coordinated V-f Control Approach for Islanded Microgrids Considering DER Inadequacy and Demand Control", invention disclosure, May 2022

[5]. **Rui Bo**, Donald Wunsch, Ronit Das, "Short-term Electricity Market Price Forecasting Tool", Software Disclosure, November 2019

Publications

Book

[1]. **Rui Bo**, Ming Ni, Qian Chen, Tao Ding, Chinese Translation of Bruce Wollenberg's book "Power Generation, Operation and Control (3rd Edition)", *Tsinghua University Press*, December 2017

[2]. Ahmad Heidari, **Rui Bo**, tutorial book "Power System Operations Modeling and Optimization Using Pyomo", to be published, *Missouri S&T Scholar's Mine*, February 2025

Peer-reviewed Journal Papers

[1]. Jian Liu, Jianwen Zhang, Zaiwu Gong, Donald C. Wunsch II, **Rui Bo**, "Analytical Dispatch Strategies for Pumped Storage Hydro: A Conditional Dynamic Programming Approach to Discontinuous Multi-Period Optimization Problems", *Applied Energy*, Volume 383, April 2025

[2]. Jian Liu, Donald C. Wunsch II, Siyuan Wang, **Rui Bo**, "Multi-parametric Analysis for Mixed Integer Linear Programming: An Application to Transmission Upgrade and Congestion Management", *Sustainable Energy, Grids and Networks*, Volume 40, December 2024

[3]. Buxin She, Fangxing Li, Jinning Wang, Hantao Cui, Xiaofei Wang, **Rui Bo**, "Virtual Inertia Scheduling (VIS) for Microgrids with Static and Dynamic Security Constraints", accepted, *IEEE Transactions on Sustainable Energy*, 2024

[4]. Shah Fahad, Arman Goudarzi, **Rui Bo**, Muhammad Waseem, Rashid Al-Ammari, Atif Iqbal, "A Robust Demand Regulation Strategy for DERs in a Single-Controllable Active Distribution Network", *IEEE Systems Journal*, vol. 18, no. 2, pp.1162 - 1173, June 2024

[5]. Oroghene Oboreh-Snapps, Buxin She, Shah Fahad, Haotian Chen, Jonathan Kimball, Fangxing Li, Hantao Cui, **Rui Bo**, "Virtual Synchronous Generator Control Using Twin Delayed Deep Deterministic Policy Gradient Method", *IEEE Transactions on Energy Conversion*, vol. 39, no. 1, pp.214 - 228, March 2024

[6]. Waqas ur Rehman, Jonathan W. Kimball, **Rui Bo**, "Multilayered Energy Management Framework for Extreme Fast Charging Stations Considering Demand Charges, Battery Degradation, and Forecast Uncertainties", *IEEE Transactions on Transportation Electrification*, vol. 10, no. 1, pp.760 - 776, March 2024

[7]. Masoud Ahmadipour, Zaipatimah Ali, Muhammad Murtadha Othman, **Rui Bo**, Mohammad Sadegh Javadi, Hussein Mohammed Ridha, Moath Alrifaey, "A high-performance democratic political algorithm for solving multi-objective optimal power flow problem", *Expert Systems with Applications*, Volume 239, April 2024

[8]. Masoud Ahmadipour, Muhammad Murtadha Othman, **Rui Bo**, Mohammad Sadegh Javadi, Hussein Mohammed Ridha, Moath Alrifaey, "Optimal power flow using a hybridization algorithm of arithmetic optimization and aquila optimizer", *Expert Systems with Applications*, Volume 235, January 2024

[9]. Yang Chen, Jianxue Wang, **Rui Bo**, Chenjia Gu, Qingtao Li, "Risk-Averse scheduling of integrated electricity-heat systems considering multi-energy network operations for resilience enhancement against contingencies", *International Journal of Electrical Power & Energy Systems*, Volume 153, November 2023

[10]. Yang Chen, Jianxue Wang, Siyuan Wang, **Rui Bo**, Chenjia Gu, Qingtao Li, "Managing Reserve Deliverability Risk of Integrated Electricity-Heat Systems in Day-ahead Market: A Distributionally Robust Joint Chance Constrained Approach", *IET Generation, Transmission & Distribution*, to appear, 2023

[11]. Buxin She, Fangxing Li, Hantao Cui, Hang Shuai, Oroghene Oboreh-Snapps, **Rui Bo**, Nattapat Praisuwanna, Jingxin Wang, Leon M. Tolbert, "Inverter PQ Control with Trajectory Tracking Capability for Microgrids Based on Physics-informed Reinforcement Learning", *IEEE Transactions on Smart Grid*, to appear, 2023

[12]. Buxin She, Fangxing Li, Hantao Cui, Jinning Wang, Liang Min, Oroghene Oboreh-Snapps, **Rui Bo**, "Decentralized and Coordinated V-f Control for Islanded Microgrids Considering DER Inadequacy and Demand Control", *IEEE Transactions on Energy Conversion*, to appear, 2023

[13]. Tao Jiang, Geert Deconinck, Jianzhong Wu, Linquan Bai, **Rui Bo**, Yunfei Mu, Vladimir Terzija, "Guest editorial: Special issue on integrated local energy systems", *International Journal of Electrical Power & Energy Systems*, Volume 148, June 2023

[14]. Azhar Ul-Haq, Shah Fahad, Saba Gul, **Rui Bo**, "Intelligent control schemes for maximum power extraction from photovoltaic arrays under faults", *Energies*, to appear, 2023

[15]. **Rui Bo**, Linquan Bai, Antonio J. Conejo, Jianzhong Wu, Tao Jiang, Fei Ding, Babak Enayati, "Special Section on Local and Distributed Electricity Markets", *IEEE Transactions on Smart Grid*, to appear, 2022

[16]. Jian Liu, Meng Ou, **Rui Bo**, Fan-lin Meng, Zhuoni Dai, "Optimal Economic Dispatch Policy for Prosumer with Energy Storage Considering the Self-consumption Demand", *Computers & Industrial Engineering*, Volume 176, February 2023

[17]. Buxin She, Fangxing Li, Hantao Cui, Jingqiu Zhang, **Rui Bo**, "Fusion of Model-free Reinforcement Learning with Microgrid Control: Review and Insight", *IEEE Transactions on Smart Grid (Early Access)*, 15 November 2022

[18]. Qiuyi Hong, Fanlin Meng, Jian Liu, **Rui Bo**, "A Bilevel Game-Theoretic Decision-Making Framework for Strategic Retailers in Both Local and Wholesale Electricity Markets", *Applied Energy*, Volume 330, Part A, 15 January 2023

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