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Curriculum Vitae

HASHEM NEHRIR, IEEE Life Fellow

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Education:

Ph.D. 1978, M.S. 1971, B.S. 1969 (all degrees in electrical engineering from Oregon State University)

Areas of Interest:

Modeling, analysis and control of power systems; distributed generation, including but not limited to wind, solar photovoltaic, fuel cells, marine energy; hybrid alternative energy power generation systems; smart grid applications, including microgrid design and power management, demand response; intelligent control applications to power systems.

Summary:

In my more than 4-decade educational career, I have developed and/or taught a variety of courses on electric power systems, alternative energy power generation, electric machinery, electric circuits, and control. I have also worked on a variety of research projects, a summary of which is given below. My active research includes modeling, control, and energy management of alternative energy power generation sources and microgrids with multiple power generation sources and electrical load management (demand response) for smart grid and microgrid. I have collaborated with scientists at the DOE's Pacific Northwest National Laboratory (PNNL) and Lawrence Berkeley National Laboratory (LBL) and private industry.

My research has been supported by Government and private agencies for a total of over $4.25M, including: The US National Science Foundation (NSF), NSF-EPSCoR, US Department of Energy (DOE), PNNL, DOE-EPSCoR, the Office of Naval Research (ONR), Electric Power Research Institute, The Montana Power Company (now NorthWestern Energy), Montana Electric Power Cooperatives, Montana Electric Power Affiliate Program (MEPRA) at Montana State University (MSU), and the American branch of Japan-based NEC Corporation (NEC Labs America). I have been conducting research on renewable/alternative Energy power generation system modeling and control since 1994. In 2002, as a result of my research on hybrid alternative energy systems, supported by NSF, I developed a senior/graduate course, Alternative Energy Power Generation, which I have taught since 2003.

I have authored or co-authored four textbooks: *Basic Electric Circuits* (1980), *Hybrid Simulation of Engineering Systems*)1986, *Modeling and Control of Fuel Cells: Distributed Generation Applications* (2009), and *Smart Grid: Simple Language* (2022). My research on fuel cell modeling and control during 1999-2009, supported by NSF, NSF-EPSCoR and DOE's National Energy Technology Laboratory and PNNL (through the HiTEC Center at MSU) resulted in dynamic models for PEM and solid-oxide fuel cells, suitable for distributed power generation studies. These models have been used by graduate students or scientists/engineers working in this area around the world.

I have lectured on my research and educational activities around the globe, including Australia, Canada, China, Germany, Iran, Japan, Poland, and USA. I am an *IEEE Fellow* for contributions to Alternative Energy Power Generation system modeling and Control. I am a past Editor of *IEEE Transactions on Sustainable Energy* (2009-2015) and Consulting Editor of the journal (2016-2021), recipient of *Wiley Faculty Award for Meritorious Research* (the highest research award bestowed by MSU) in 2010, the 2016 recipient of IEEE Power & Energy Society *Ramakumar Family Renewable Energy Excellence Award*, and a 2017 recipient of the *Albert Nelson Marquis Lifetime Achievement Award* bestowed by Marquis Who's Who Publications Board.

Professional Experience:

2019-present: Research Professor, Department of Electrical & Computer Engineering, Montana State University
1996-2018: Professor, Department of Electrical & Computer Engineering, Montana State University
2001-2010, Chair, Undergraduate Curriculum Committee, Electrical & Computer Engineering Department

1999-2007, Member, Promotion & Tenure Committee at ECE Department of College of Engineering at MSU
1997-2003, Member of Montana State University Faculty Council (now Faculty Senate)
1991-96: Associate Professor, Department of Electrical Engineering, Montana State University
1987-91: Assistant Professor, Department of Electrical Engineering, Montana State University
1986-87: Visiting Scholar, Electrical Engineering Department, University of Idaho, Moscow, ID
1984-86: Associate Professor and Chairman, Electrical Engineering Department, Shiraz University, Shiraz, Iran
1981-83: Technical Advisor, Fars Regional Power Company, Shiraz, Iran (on leave from Shiraz University)
1980-81: Acting Dean, College of Engineering, Shiraz University
1978-80: Director of Student Affairs, College of Engineering, Shiraz University.
1978-84: Assistant Professor, Electrical Engineering Department, Shiraz University
1975-78: Teaching/Research Assistant, Elec. Eng. Dept., Oregon State University, Corvallis, OR
1974-75: Member of Board of Directors, Technical School of Electronics (associated with Shiraz University)
1971-75: Instructor, Electrical Engineering Department, Shiraz University
1970-71: Teaching Assistant, Electrical Engineering Department, Oregon State University
1969: Design engineer, Electric Lift Truck Division, Hyster Company, Portland, OR

Professional Activities/Services:

- Editor, *IEEE Transactions on Sustainable Energy* (2009-2015), Consulting Editor (2016-2021)
- Member of the Editorial Board, *Electrical Power Components & Systems* Journal (2004-2009)
- Associate Editor, Journal of *Intelligent & Fuzzy Systems* (1996-2000)
- Associate Editor, Journal of *Computers & Electrical Engineering* (1998-2003)
- Member of International Technical Program Committee of many power & energy related international conferences
- Frequent reviewer, *IEEE Transactions on Energy Conversion, Power Systems, Power Delivery,* and several other international journals
- Vice Chair, IEEE Power & Energy Society's (PES) Renewable Technologies Subcommittee (2009-present)
- Treasurer, IEEE Central Montana Section, (2014-present)
- Member: IEEE PES Distributed Generation and Energy Storage Subcommittee, Power Engineering Education Committee and its Research subcommittee
- Chair, IEEE Montana Section (1998), Vice Chair (1997)
- General Chair, North American Power Symposium, Montana State University, Bozeman, October 1995

Selected Achievements/Awards/Recognitions, Invited Lectures/ Panels:

- 2021: Invited lecture (virtual): Smart Grid: resilience and Self-Healing, PEER Program, University of Dominican Republic.
- 2020: Invited lecture (virtual) to general, non-engineer, audience: 'What is the Smart Grid Buzz?,' Montana State University.
- 2019: Invited keynote speaker, Renewable Energy: Research and Business, July 8-9, 2019, Wroclaw, Poland.
- 2018: Invited External Ph.D. Dissertation Examiner and Ph.D. defense attendee, University of Waterloo, Canada.
- 2018: Invited keynote speaker, Renewable Energy-Based Power Generation: Role of Demand Response and Storage, Renewable Energy Summit, April 29-30, Orlando, FL.
- 2017: Invited External Ph.D. Dissertation Evaluator for the dissertation, Development of Hybrid Energy System for Rural Area, Indian Institute of Technology, Roorkee, India.
- 2017: Invited article by Kaveh Dehghanpour and Hashem Nehrir, "Distributed MultiAgent System Approaches for Microgrid Power Management," *IEEE Smart Grid Newsletter,* available at: http://smartgrid.ieee.org/newsletters/february-2017/distributed-multi-agent-system-approaches-for-microgrid-power-management
- 2016: the recipient of *IEEE-PES Ramakumar Family Renewable Energy Excellence Award*.
- 2016: Invited External Ph.D. Dissertation Examiner and Ph.D. defense attendee for the dissertation, Thermal Analysis for the Purpose of Fault Diagnosis of Commercial Proton Exchange Membrane Fuel Cells, United Arab Emirates University, Al Ain, United Arab Emirates.
- 2015: Invited External Ph.D. Dissertation Evaluator for the dissertation, DC Microgrid, Anna University, Chennai, India.
- 2014: Invited panel presentation at the 2014 *IEEE Smart Grid Innovating Technologies*, Hashem Nehrir and Chris

Colson, "Real-Time Microgrid Power Management and Control with Distributed Agents."

- 2014: Invited article by Chris Colson and Hashem Nehrir, "Integrating microgrids and multi-agent management," *IEEE Smart Grid Newsletter,* available at: http://smartgrid.ieee.org/newsletters/september-20142/integrating-microgrids-and-multi-agent-management.
- 2014: Invited presentation, IEEE Southern Alberta (Calgary), Canada PES/IAS Joint Chapter: "Role of Storage in Renewable Energy Utilization."
- 2014: Invited presentation, IEEE Northern Alberta (Edmonton), Canada PES/IAS Joint Chapter: "Role of Storage in Renewable Energy Utilization."
- 2014: Invited External Ph.D. Dissertation Evaluator for the dissertation, Hybrid Renewable Energy system Design and Optimization, Indian Institute of Technology, Roorkee, India.
- 2014: Invited keynote speaker at the 2014 International Conference on Renewable Energy Utilization, Coimbatore, India: "Renewable Energy Utilization and Role of Energy Storage for Improved Reliability and Resiliency."
- 2012: Invited presentation at Oklahoma State University, "Power Generation Options for the Future-Opportunities and Challenges with Renewables."
- 2011: Co-Recipient of the ***Best Paper Award*** (with my Ph.D. student Christopher Colson and Dr. Robert Gunderson) at the 2011 International Symposium on Resilient Control Systems (ISRCS) for the paper, C.M. Colson, M.H. Nehrir, and R.W. Gunderson, "Distributed Multi-Agent Microgrids: A Decentralized Approach to Resilient Power System Self-healing," *Proceedings*, 2011 International Symposium on Resilient Control Systems (ISRCS), August 9-11, Boise, ID.
- 2010: Elevated to ***IEEE Fellow*** Grade for contributions to modeling and control of alternative energy power generation systems.
- 2010: Recipient of Montana State University's ***Wiley Faculty Award for Meritorious Research***, the highest award bestowed for research.
- 2010: Chongqing University, China: M.H. Nehrir, "Smart Grid and Microgrid: From Concept to Reality."
- 2007: Chongqing University, China: M.H. Nehrir, "Alternative Energy Power Generation: Research and Education at Montana State University."
- 2007: Co-Recipient of the 2007 IEEE PES Energy Development and Power Generation Committee **Prize Paper Award** (with my Ph.D. student Caisheng Wang and Dr. Steven Shaw) for the paper: C. Wang, M.H. Nehrir, and S.R. Shaw, "Dynamic Models and Model Validation for PEM Fuel Cells using Electrical Circuits," *IEEE Transactions on Energy Conversion*, Vol. 20, No. 2, June 2005.
- 2004: Invited External Ph.D. Examiner and Ph.D. defense attendee for the dissertation Microturbine Dynamic Modeling, Electrical & Computer Engineering Department, University of Waterloo, Waterloo, Ontario, Canada.
- 2004: Invited presentation, Curtin University of Technology, Perth, Australia: "Fuel Cell Modeling and Control for Distributed Power Generation Applications."
- 2001: Invited presentation, Curtin University of Technology, Perth Australia: "Fuzzy Logic-Based Load Management in a Real-time Pricing Environment."
- 2001: Recipient of Montana State University *Alumni Association and Bozeman Area Chamber of Commerce* ***Award of Excellence*** in Education.
- 1998: Research Fellow, Department of Electrical & Computer Engineering, Kumamoto University, Kumamoto, Japan: summer 1998, sponsored by Japan Society for Promotion of Science (JSPS).
- 1998: Invited presentation, Kumamoto University, Kumamoto Japan: "Wind and Photovoltaic Power Generation System Modeling and Control."
- 1997: Invited presentation, Dresden University of Technology, Dresden, Germany: "Unit Sizing of Hybrid Stand-Alone Wind-Photovoltaic Generating Systems."
- 1995: Selisian University of Technology, Gliwice, Poland: "Application of Fuzzy Logic Control in Damping of Power Oscillations in Power Systems."
- Listed in more than fifteen Marquis *Who's Who* publications since 2003, including *Who's Who in America, Who's Who in Engineering Education, Who's Who in Engineering Science, and Who's Who in the World*.
- Many invited panel presentations at the IEEE PES General Meetings or IEEE Innovative Smart Grid Conference.
- Honor Society Membership: Eta-Kappa-Nu, Tau-Beta-Pi
- Advisor of several students who won awards/recognitions:
    - Kaveh Dehghanpour, Ph.D. candidate, received the **Graduate Student Pierre Award** at MSU ECE Department for best journal publication in 2016, 2017.

- Ali Pourmousavi, Ph.D. 2014: received the **Graduate Student Pierre Award** at MSU ECE Department for best journal publication in 2011, 2014.
- Christopher Colson, Ph.D. 2012: received **Best Symposium Paper Award** at the 2011 International Symposium on Resilient Control Systems (ISRCS), August 9-11, Boise, ID.
- Christopher Colson received the **Graduate Student Pierre Award** at MSU ECE Department for best journal publication in 2010.
- Christopher Colson won the **Best Student Poster Award** at the 2008 IEEE PES General Meeting, Pittsburgh, PA, July 2008, for his poster, Power Management of Multiple-Source Distributed Generation Systems.
- Christopher Colson won a prestigious three-year **NSF Graduate Fellowship Award**, March 2008, to continue his Ph.D. studies on intelligent energy management of microgrids.
- Caisheng Wang, Ph.D. 2007: received the **Prize Paper Award** from IEEE PES Energy Development and Power Generation Technical Committee in 2007.
- Caisheng Wang received the ECE Department's **Pierre Award** for best journal publication in 2006.
- In 2004 NSF chose some of the results of Caisheng Wang's research as **"NSF Nuggets"** for presenting to the public.
- Vivek Menon, MSEE, 2006: **won third place** at the Student Poster Competition, 2005 IEEE PES General Meeting, San Francisco, CA, June 2005, for his poster, A Hybrid Islanding Detection Technique for Distributed Generation.
- Brock LaMeres, BSEE, 1998: won **first place** at the 1999 IEEE WESCON student project presentation contest, Santa Clara, CA, for his paper and presentation, Fuzzy Logic-Based Voltage Regulator for Synchronous Generator.
- Advisor of several undergraduate design project teams that won first, second, or third place in the local and regional IEEE-sponsored student paper/project competitions between 1988 and 2010.

Sponsored Research/Creative Activities (since 1988):

- 2018-2023, Resilient and Extreme-Event-Aware Microgrid-Based Distribution System Architecture and Power Management, sponsored by NSF, sole PI.
- 2013-2017, Design Methodology Development for All Electric and Fuel Cell Powered Ships, sole PI.
- 2011-2016, Making the Grid Smart through Smart Microgrids, DOE Office of Science, sole PI.
- 2011-2014, Microgrid Power Management, NEC Labs America, sole PI.
- 2011-2014, Design and Implementation of a Laboratory-Scale Solar Photovoltaic Power Generation System and a Smart Microgrid for Education Enhancement, Montana Space Grant Consortium, sole PI.
- 2009-2012, Intelligent Energy Management of Microgrids and demand response for smart grid: DOE's Pacific Northwest National Laboratory, Sole PI.
- 2006-2009, Intelligent Electrical Load Control for Enhancing Power System Performance, sponsor: DOE. This work was a sub-contract from Montana Tech. I was one of several PIs at Montana State University, Montana Tech, and University of Wyoming.
- 2002-09, Solid-Oxide Fuel Cell Modeling and Control for Distributed Generation Applications: This work includes SOFC modeling, control, grid interfacing, and stability analysis, sponsor: DOE, through the Multidisciplinary Fuel Cell Research Center (HiTEC) at Montana State University, funded by USDOE as a sub-contract from PNNL. I was one of the several MSU PIs (my share was approximately.
- 2002-2006, Modeling and Control of Multi-source Wind/PV/Fuel Cell Distributed Generation Systems, sponsored by NSF, PI.
- 2001-2002, Locomotive Engine Performance Monitoring and Analysis, Department of Transportation, co-PI.
- 2000-01, Residential and Electric Vehicle Applications of Fuel Cells, sponsored by the NSF-EPSCoR (then MONTS) program, Montana State University, PI.
- 1997-2002, Robust Fuzzy Logic-Based Control Strategies for Enhancing Power System Damping, sponsored by NSF, Montana State University, and Montana Electric Power Research Affiliate Program, PI. This project had a subcontract part performed at the University of New Mexico.
- 1997-98, Intelligent Demand-Side Management of Wind/Photovoltaic Generating Systems Using Fuzzy Logic, sponsored by the NSF-EPSCoR Program at Montana State University, PI (20,000).
- 1994-2000, Alternative Energy Implementation – Wind/Photovoltaic Power Generation, sponsored by the

DOE/EPSCoR Program at Montana State University, a multi-department project.

- 1994, Enhancement of the Energy Conversion/Electric Power Laboratory at MSU, sponsored by Montana Power Company.
- 1992-95, Robust Control Strategies for Enhancing Power System Damping, sponsored by NSF, Montana State University, and Montana Electric Power Research Affiliates Program, Co-PI.
- 1991-96, Electric Water Heater Modeling and Demand-Side Management Studies, sponsored by the Central Montana and Upper Missouri Electric Coops (91-93), Montana State University and Montana Electric Power Research Affiliates Program (94-96), sole PI.
- 1989-92, Development of a Cold Load Pickup Program for Predicting Distribution System Power Demand after a Period of Power Outage During Winter Season, sponsored by the Montana Power Company, Montana State University, and Montana Electric Power Research Affiliates Program, PI.
- 1988-91, Robust Adaptive Control Strategies for Power System Damping, sponsored by the Electric Power Research Institute, Montana State University Engineering Experiment Station and Montana Electric Power Research Affiliates Program, Co-PI.

Graduate Students Mentored (2000-present):

Graduate Students Graduated, Visiting Student, Postdoc mentored:

Sepideh Radhoush	Current Ph.D. student
Kaveh Dehghanpour	Ph.D. 2017
Ali Pourmousavi	Ph.D. 2014
Reza Ahmadi	Visiting Ph.D. student from Aalborg University, Denmark (AY 2013-2014)
Ashraf Haque	Post doc (AY 2012-2013)
Christopher Colson	Ph.D. 2012
Jon Christopherson	Ph.D. 2011 (co-advised with Professor John Morrison of Montana Tech.)
Caisheng Wang	Ph.D. 2007
Ruhua You	Ph.D. 2006
Farshina Nazrul Shimim	MSEE 2020
Nathan Kelly	MSEE 2017
Seth Cooper	MSEE2017
Andrew Klem	MSEE 2016
Aili Shigwedha	MSEE 2015
Adnan Morshed	Master of Engineering (ME) 2014
Kevin Marchese	MSEE, 2014
Colin Young	MSEE 2014
Aric Litchy	MSEE 2013
Jon Wilson	MSEE 2012
Stasha Patrick	MSEE 2011
Andrew Cifala	MSEE 2010
Runmin Jia	MSEE 2008
Vivek Menon	MSEE 2006
Sridhar Guda	MSEE 2005
Donald Nelson	MSEE 2003
Jie Lu	MSEE 2000

Publications (Books/Book Chapters)

*(2022) Book (for general public): Hashem Nehrir and Kaveh Dehghanpour, Smart Grid: Simple Language, Lambert Academic Publishing (LAP), ISBN-13: 978-6204736242

*(2016) Book Chapter: M. Hashem Nehrir and Caisheng Wang, chapter on *Fuel Cells* for the undergraduate textbook titled *Electric Renewable Energy,* Elsevier, 2016.

*(2009) Textbook: Hashem Nehrir and Caisheng Wang, *Modeling and Control of Fuel Cells: Distributed Generation Applications*, IEEE Press-Wiley.

*(2007) Book chapter: C. Wang and M.H. Nehrir, *Control of Grid-Connected and Stand-Alone Fuel Cell Distributed Generation Systems* (published in the book entitled, *Fuel Cell and Distributed Generation*, Francisco Jurado Melguizo, Editor), Research Signpost, ISBN: 978-81-308-0179-7.

*(1986) Textbook: Hashem Nehrir, *Analog and Hybrid Simulation of Engineering Systems*, Shiraz University Press, Shiraz, Iran.

*(1981) Textbook: Hashem Nehrir, *Basic Electric Circuits,* (went into four printings between 1981 and 1995), Shiraz University Press.

Publications: 201 total

Journal papers (73 total): The name of student co-authors is in bold letters.

1. (2022) Zagros Shahooei, **Lane Martin**, Hashem Nehrir, and Maryam Bahramipanah, "A Novel Agent-Based Power Management Scheme for Smart Multiple-Microgrid Distribution Systems," *Energies*, Special Issue: Artificial Intelligence and Optimization for Smart Grids 2022, 15, 1774, https://www.mdpi.com/1996-1073/15/5/1774/htm
2. (2022) **Sepideh Radhoush,** Maryam Bahramipanah, Hashem Nehrir and Zagros Shahooei, "A Review on State Estimation Techniques in Active Distribution Networks: Existing Practices and Their Challenges," *Sustainability* 2022, 14, 2520, Special Issue: Optimal Dynamic Control of Active Distribution Power System, **https://doi.org/10.3390/su14052520**
3. (2019) **Kaveh Dehghanpour**, and Hashem Nehrir, "An Agent-Based Hierarchical Bargaining Framework for Power Management of Multiple Cooperative Microgrids," *IEEE Transactions on Smart Grid,* Vol.10, Issue 1, Jan. 2019.
4. (2019) **Kaveh Dehghanpour**, and Hashem Nehrir, "A Market-Based Resilient Power Management Technique for Distribution Systems with Multiple Microgrids Using a Multi-Agent System Approach," *Electric Power Components and Systems*, DOI: 10.1080/15325008.2018.1527869, available online at https://www.tandfonline.com/doi/full/10.1080/15325008.2018.1527869.
5. (2018) **Kaveh Dehghanpour** and Hashem Nehrir, "Real-Time Multiobjective Microgrid Power Management Using Distributed Optimization in an Agent-Based Bargaining Framework," *IEEE Trans. on Smart Grid*, Vol. 9, Issue 6, November 2018.
6. (2018) **Kaveh Dehghanpour**, M. Hashem Nehrir, John W. Sheppard, and **Nathan Kelly**, "Agent-Based Modeling of Retail Electrical Energy Markets with Demand Response," *IEEE Trans. on Smart Grid*, Vol. 9, Issue 4, July 2018.
7. (2017) M. Ruhul Amin, **Jonathan D, Wilson**, Hashem Nehrir, 'Operation and Efficiency Evaluation of a Hybrid Solid Oxide Fuel Cell – Microturbine Combined Cycle System," *Journal of Heat, Energy, and Mass Transfer*, Vol. 39, pg. 115-129.
8. (2017) **Kaveh Dehghanpour**, Christopher Colson, and Hashem Nehrir," (invited paper) A Survey on Smart Agent-Based Microgrids for Resilient/Self-Healing Grids," *Energies*, Vol. 10, Issue 5 May 2017, available at: http://www.mdpi.com/1996-1073/10/5/620/pdf.
9. (2016) **Kaveh Dehghanpour**, M. Hashem Nehrir, John W. Sheppard, and **Nathan Kelly**, "Agent-Based Decision Making in Electrical Energy Markets Using Dynamic Bayesian Networks," *IEEE Transactions on Power Systems*, Vol. 31, No. 6, November 2016.
10. (2016) **Reza Ahmadi Kordkheili, S. Ali Pourmousavi kani**, Mehdi Savaghebi, Josep Guerrero, M. Hashem Nehrir, "Assessing the Potential of Plug-in Electric Vehicles in Active Distribution Networks," *Energies,* 2016, 9(1), 34, available online at http://www.mdpi.com/1996-1073/9/1/34.
11. (2015) C. Wang, C.J. Miller, M.H. Nehrir, J.W. Sheppard, S.P. McElmurry, "A Load Profile Management Integrated Power Dispatch Using a Newton-Like Particle Swarm Optimization Method," *International Journal of Sustainable Computing, Informatics and Systems*, Vol. 8, December 2015, pp. 8-17.
12. (2015) **S. A. Pourmousavi,** M. H. Nehrir, and R.K. Sharma, "Multi-Timescale Power Management for Islanded Microgrids Including Storage and Demand Response," *IEEE Transactions on Smart Grid*, Vol. 6, No. 3, May 2015.
13. (2014) **S. A. Pourmousavi** and M. H. Nehrir, "Introducing Dynamic Demand Response in the LFC Model," *IEEE Transactions on Power Systems*, Vol. 29, No. 4, July 2014.

14. (2014) A.U. Haque, M.H. Nehrir, and P. Mandal, "A Hybrid Intelligent Model for Deterministic and Quantile Regression Approach for Probabilistic Wind Power Forecasting," *IEEE Transactions on Power Systems*, Vol. 29, No. 4, July 2014.
15. (2014) **S. A. Pourmousavi, S.N. Patrick** and M. H. Nehrir, "Real-Time Demand Response through Aggregate Electric Water Heaters for Load Shifting and Balancing Wind Generation," *IEEE Transactions on Smart Grid*, Vol. 5, No.2, March 2014.
16. (2014) **C.M. Colson**, M.H. Nehrir, R.K. Sharma, and B. Asghari, "Improving Sustainability of Hybrid Energy Systems - Part I: Incorporating Battery Round-trip Efficiency and Operational Cost Factors," *IEEE Transactions on Sustainable Energy*, Vol. 5, No. 1, Jan. 2014.
17. (2014) **C.M. Colson**, M.H. Nehrir, R.K. Sharma, and B. Asghari, "Improving Sustainability of Hybrid Energy Systems - Part II: Managing Multiple Objectives with a Multi-agent System," *IEEE Transactions on Sustainable Energy*, Vol. 5, No. 1, Jan. 2014.
18. (2013) **C.M. Colson** and M.H. Nehrir, "Comprehensive Real-Time Microgrid Power Management and Control with Distributed Agents," *IEEE Transactions on Smart Grid (Special issue on Computational Intelligence)*, Vol. 4, No. 1, March 2013.
19. (2012) **S.A. Pourmousavi**, M.H. Nehrir, "Real-Time Central Demand Response for Primary Frequency Regulation in Microgrids," *IEEE Transactions on Smart Grid (Special issue on Microgrid)*, Vol. 3, No. 4, December 2012.
20. (2011) M.H. Nehrir, C. Wang, K. Strunz, H. Aki, R. Ramakumar, J. Bing, Z. Salameh, Z. Miao, "A Review of Hybrid Renewable/Alternative Energy Systems for Electric Power Generation: Configurations, Control and Applications," *IEEE Transactions on Sustainable Energy*, Vol. 2, No. 4, October 2011.
21. (2011) J.A. Martinez, F. de León, A. Mehrizi-Sani, M.H. Nehrir, C. Wang, V. Dinavahi, "Tools for Analysis and Design of Distributed Resources, Part II: Tools for Planning, Analysis and Design of Distribution Networks with Distributed Resources," *IEEE Transactions on Power Delivery*, Vol. 26, No. 3, July 2011.
22. (2011) J.A. Martinez, V. Dinavahi, M.H. Nehrir, X. Guillaud, "Tools for Analysis and Design of Distributed Resources, Part IV: Future Trends," *IEEE Transactions on Power Delivery*, Vol. 26, No. 3, July 2011.
23. (2011) **C.M. Colson** and M.H. Nehrir, "Evaluating the Benefits of a Hybrid Solid Oxide Fuel Cell Combined Heat & Power Plant for Energy Sustainability and Emissions Avoidance," *IEEE Transactions on Energy Conversion*, Vol. 12, No. 1, March 2011.
24. (2010) **S.A. Pourmousavi**, M.H. Nehrir, C.M. Colson, and C. Wang, "Real-Time Energy Management of a Stand-Alone Hybrid Wind-Microturbine Energy System Using Particle Swarm Optimization," *IEEE Transactions on Sustainable Energy*, Vol. 1, No. 3, October 2010.
25. (2009) **C.M. Colson**, M.H. Nehrir, M.D. Deibert, M.R. Amin, and C. Wang, "Efficiency Evaluation of Solid-Oxide Fuel Cells in Combined-Cycle Operation," *ASME Transactions, Journal of Fuel Cell Science and Technology,* Vol. 6, May 2009.
26. (2008) **C. Wang** and M.H. Nehrir, "Power Management of Stand-Alone Wind/Photovoltaic/Fuel-Cell Energy Systems," *IEEE Transactions on Energy Conversion,* Vol. 23. No. 3, September 2008.
27. (2007) **C. Wang**, M.H. Nehrir, "A Physically-Based Dynamic Model for Solid Oxide Fuel Cells," *IEEE Transactions on Energy Conversion,* Vol. 22, No. 4, December 2007.
28. (2007) **C. Wang**, M.H. Nehrir, "Short-Time Overloading Capability and Distributed Generation Applications of Solid Oxide Fuel Cells," *IEEE Transactions on Energy Conversion,* Vol. 22, No. 4, December 2007.
29. (2007) **C. Wang**, M.H. Nehrir, "Load Transient Mitigation for Stand-alone Fuel Cell Power Generation Systems," *IEEE Transactions on Energy Conversion,* Vol. 22, No. 4, December 2007.
30. (2007) **S. Pasricha, M. Keppler**, S.R. Shaw, and M.H. Nehrir, "Comparison and Identification of Static Electrical Terminal Fuel Cell Models," *IEEE Transactions on Energy Conversion*, Vol. 22, No. 3, September 2007.
31. (2007) R. You, M.H. Nehrir, and D.A. Pierre, "Controller Design for SVC and TCSC to Enhance Damping of Power System Oscillations," *Electric Power Components and Systems*, Vol. 35, No. 8, August 2007.
32. (2007) **V. Menon** and M.H. Nehrir, "A Hybrid Islanding Detection Technique Using Voltage Unbalance and Frequency Set Point," *IEEE Transactions on Power Systems,"* Vol. 22, No. 1, February 2007.
33. (2007) **C. Wang**, M.H. Nehrir, "Fuel Cells and Load Transients: Fulfilling the Need for Transient Mitigation," IEEE Power & Energy Magazine, Vol. 5, No. 1, January/February issue 2007.
34. (2006) **C. Wang**, M.H. Nehrir, and H. Gao, "Control of PEM Fuel Cell Distributed Generation Systems," *IEEE Transactions on Energy Conversion*, Vol. 21, No. 2, June 2006.
35. (2006) M.H. Nehrir, **C. Wang**, and S.R. Shaw, "Fuel Cells: Promising Devices for Distributed Generation, Understanding their Modeling and Need for Control," *IEEE Power and Energy Magazine*, Vol. 4, No. 1, January/February 2006.

36. (2006) **D.B. Nelson**, M.H. Nehrir, and **C. Wang**, **"**Unit Sizing and Cost Analysis of Stand-Alone Hybrid Wind/PV/Fuel Cell Power Generation Systems," *Renewable Energy*, Vol. 31, Issue 10, August 2006, pp. 1641-1656.
37. (2006) **S.R. Guda, C. Wang**, and M.H. Nehrir, "Modeling of Microturbine Power Generation Systems," *Electric Power Components and Systems,* Vol. 34, No. 9, September 2006.
38. (2005) **C. Wang**, M.H. Nehrir, and S.R. Shaw, "Dynamic Models and Model Validation for PEM Fuel Cells using Electrical Circuits," *IEEE Transactions on Energy Conversion*, Vol. 20, No. 2, June 2005, pp. 442-451. ***This paper won the 2007 IEEE PES Energy Development & Power Generation Technical Committee award for its global impact.***
39. (2005) **D.B. Nelson**, M.H. Nehrir, and V. Gerez, "Economic Evaluation of Grid-Connected Fuel Cell Systems," *IEEE Transactions on Energy Conversion*, Vol. 20, No. 2, June 2005, PP 452-458.
40. (2004) **C. Wang** and M.H. Nehrir, "Analytical Approaches for Optimal Placement of Distributed Generation Sources in Distribution Systems," *IEEE Transactions on Power Systems,* Vol. 19, No. 4, November 2004, PP 2068-2076.
41. (2004) **J. Lu**, M. H. Nehrir, and D. A. Pierre, "A Fuzzy Logic-Based Adaptive Damping Controller for Static VAR Compensator," *Electric Power Systems Research Journal, 68 (2004) 113-118.*
42. (2003) **R. You**, H.J. Eghbali, and M.H. Nehrir, "An On-line Adaptive Neuro-fuzzy Power System Stabilizer for Multi-machine Systems," *IEEE Transactions on Power Systems,* Vol. 18, No.1, Feb. 2003.
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