

**R. Mark Nelms**  
**Professor and Chair**  
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### **Education**

- Ph.D., Virginia Polytechnic Institute and State University, 1987
- M.S., Auburn University, 1982
- B.E.E., Auburn University, 1980

### **Academic Experience**

- Auburn University, Department Chair, 2009 – present
- Auburn University, Professor, 1997 – present
- Auburn University, Associate Professor, 1992 – 1997
- Auburn University, Assistant Professor, 1987 – 1992
- Auburn University, Instructor, 1984 – 1987

### **Research Interests**

- Power electronics, power systems, renewable energy, electric machines

### **Certifications or Professional Registration**

- PE, Alabama, 17289

### **Current Membership in Professional Organizations**

- Fellow, Institute of Electrical and Electronics Engineers (IEEE)
- Member, American Society for Engineering Education

### **Honors and Awards**

- IEEE Industry Applications Society Distinguished Service Award, 2019
- Fellow of the IEEE, 2004 – for technical leadership and contributions to applied power electronics
- William F. Walker Merit Teaching Award for 2004 (Samuel Ginn College of Engineering)
- Outstanding Paper Award (1996) for the IEEE Transactions on Industrial Electronics for “Implementation of a Fuzzy Controller for DC-DC Converters Using an Inexpensive 8-bit Microcontroller”

### **Service Activities**

#### *Auburn University*

- Chair, Computer Science and Software Engineering Chair Search Committee, 2015-2016
- Member, McCrary Institute Director Search Committee, 2015 - 2016
- Member, Dean’s Search Committee, 2011-2012
- Member, University Promotion & Tenure Committee, 2004-2007
- Member, University Faculty Dismissal Hearing Committee, 2006 - 2009

- Member, Academic Program Review Committee for the Department of Consumer Affairs, 2008
- Chair, Civil Engineering Chair Search Committee, 2012-2013
- Chief Faculty Advisor, Alabama Alpha Chapter of Tau Beta Pi, 2001-present
- Faculty Advisor, Eta Kappa Nu Xi Chapter, 2008-present

*External to Auburn University*

- Chair, Southeastern Center for Electrical Engineering Education, 2019-2021
- Chair, Southeastern Electrical & Computer Engineering Department Heads Association, 2012
- Vice-Chair, Southeastern Electrical & Computer Engineering Department Heads Association, 2011
- Secretary, Southeastern Electrical & Computer Engineering Department Heads Association, 2010
- Finance Chair, IEEE Applied Power Electronics Conference, 2008-present
- Finance Chair, IEEE Industry Applications Society Annual Meeting, 2008-2015
- Finance Chair, IEEE Energy Conversion Congress and Exhibition, 2010, 2012-2014
- Chair, IEEE Industry Applications Society Meetings Department, 2006-2016

**Select Publications**

- J. David Irwin and R. Mark Nelms, Basic Engineering Circuit Analysis, 12<sup>th</sup> edition, John Wiley & Sons, 2021
- Mayur Basu, Vincentius R. Mahindra, Jinho Kim, Robert M. Nelms, and Eduard Muljadi, “Comparison of Active and Reactive Power Oscillation Damping with PV Plants,” IEEE Transactions on Industry Applications, Vol. 57, No. 3, May/June 2021, pp. 2178-2186, DOI: 10.1109/TIA.2021
- Saad F. Al-Gahtani and R. M. Nelms, “Performance of a Shunt Active Power Filter for Unbalanced Conditions Using Only Current Measurements,” Energies, January 2021, DOI: 10.3390/en14020397
- Saad F. Al-Gahtani, Haitham Z. Azazi, Robert M. Nelms, and Zakaria M. Elbarbary, “Detection of Negative Sequence Components in Diagnosing and Tolerating Open-gate Fault for a Voltage-Source Inverter in an Induction Motor Drive,” IET Power Electronics, Vol. 13, No. 18, December 2020, pp. 4194-4203, DOI: 10.1049/iet-pel.2020.0289
- S. F. Al-Gahtani and R. M. Nelms, “A Frequency Adaptive Control Scheme for a Three-Phase Shunt Active Power Filter,” Electrical Engineering, September 2020, DOI:10.1007/s00202-020-01105-4
- L. Wang, S. Mao, B. Wilamowski, and R. M. Nelms, “Ensemble Learning for Load Forecasting,” IEEE Transactions on Green Communications and Networking, Vol. 4, No. 2, June 2020, pp. 616-628, DOI: 10.1109/TGCN.2020.2987304
- Z. Dong, J. Tan, E. Muljadi, R. Nelms, A. St-Hilaire, M. Pevarnik, M. Jacobson, “Developing of Quaternary Pumped Storage Hydropower for Dynamic Studies,” IEEE Transactions on Sustainable Energy, Vol. 11, No.4, October 2020, pp. 2870-2878, DOI: 10.1109/TSSTE.2020.2980585

- Bo Wu, James S. Smith, Bogdan M. Wilamowski, and R. M. Nelms, “DCMDS-RV: density concentrated multi-dimensional scaling for relation visualization,” Journal of Visualization, November 2018, DOI: 10.1007/s12650-018-0532-0
- Yu Wang, Yinxing Shen, Shiwen Mao, Guangun Cao, and Robert M. Nelms, “Adaptive Learning Hybrid Model for Solar Intensity Forecasting,” IEEE Transactions on Industrial Informatics, Vol. 14, No. 4, April 2018, pp. 1635-1645, DOI: 10.1109/TII.2017.2789289
- Jiao, Jiao and R. M. Nelms, “Adjusting Output Impedance using a PI Controller to Improve the Stability of a Single-phase Inverter under Weak Grid,” Transactions on Environment and Electrical Engineering, Vol. 1, No. 4, November 2016, pp. 50-57
- Zerui Dong, Eduard Muljadi, Jinho Kim, and Robert M. Nelms, “Dynamic Modeling of Full Converter Adjustable-speed Pumped Storage Hydropower (FC AS-PSH),” 2020 IEEE Power & Energy Society General Meeting, August 2020, Montreal, QC, Canada, DOI: 10.1109/PESGM41954.2020.9281806
- Saad Al-Gahtani and R. M. Nelms, “A Modified IRPT Control Method for a Shunt Active Power Filter for Unbalanced Conditions,” 2019 IEEE 28th International Symposium on Industrial Electronics (ISIE), Vancouver, BC Canada, pp. 720 – 727, DOI: 10.1109/ISIE.2019.8781549
- Jiao Jiao, John Y. Hung, and R. M. Nelms, “Improved Selective Harmonic Compensation for Single-Phase Inverters,” 2018 IEEE Applied Power Electronics Conference and Exposition, San Antonio, TX, March 2018, pp. 1329-1335
- Jiao Jiao, John Y. Hung, and R. M. Nelms, “Control for a Single-Phase Inverter using a Grid Current Observer,” IECON 2017 – 43rd Annual Conference of the IEEE Industrial Electronics Society, October 2017, Beijing, China, pp. 164-170
- Jiao Jiao, John Y. Hung, and R. M. Nelms, “Gain Scheduling Control Strategy for a Single-Phase Grid Connected Inverter,” 2017 IEEE 26th International Symposium on Industrial Electronics (ISIE), June 2017, Edinburgh, Scotland, pp.723-728
- Jiao Jiao, John Y. Hung, and R. M. Nelms, “State Feedback Control for Single-Phase Grid-Connected Inverter under Weak Grid,” 2017 IEEE 26th International Symposium on Industrial Electronics (ISIE), June 2017, Edinburgh, Scotland, pp.879-885