

## Alexis Kwasinski

**Current Position:** Associate Professor with tenure  
Department of Electrical and Computer Engineering  
The University of Texas at Austin

**Research Interests: Local area power and energy systems with focus on**

Power electronic systems: Circuit topology design, controls, integration of energy storage devices and of renewable and alternative power sources.

Microgrids: Modeling, control, planning, operation, and application for enhanced power availability during extreme events.

Smart-grids: Home and buildings energy management, impact of high penetration of electrical vehicles and grid-tied photovoltaic systems on electric power distribution systems.

Power supply of critical loads during extreme events: Power grids and communication systems performance, reliability and availability analysis, lifeline interdependencies characterization and modeling.

**Academic Vision:** My approach to research tends to be quite unique and unconventional in my area because, in my research vision, system analysis is supported and integrated with component level studies. This unconventional top-down research approach is supported by strong empirical validation through laboratory work, field data collection—e.g. damage assessments after notable natural disasters—and extensive deployment of measurement systems in collaboration with Pecan Street Inc. smart grid initiative. Such empirical approach used to validate system-related research is also extremely unique. In terms of teaching, I strive to educate students not only by teaching them technical content, but specially by helping them develop their reasoning and learning skills. Thus, I always encourage them to ask questions and pursue new challenges. I am always interested in students' intellectual growth and, therefore, I make myself available as much as possible for their inquiries. Ultimately, my personal goal is to have a strong positive impact on my students' careers and life experiences. In my academic vision, service is not isolated from research and teaching as I have always considered that both my external and internal service activities serve to support my research and teaching activities and have always acted as bridges between my work and the academic community. In a reciprocal way, my research and teaching activities enable me to serve my community effectively.

### EDUCATION:

**Ph.D. in Electrical Engineering** • August 2007

**University of Illinois at Urbana-Champaign** • Urbana, IL.

**Dissertation title:** “A Microgrid Architecture with Multiple-Input dc/dc Converters: Applications, Reliability, System Operation, and Control”

**Advisor:** Dr. Philip Krein.

**M.S. in Electrical Engineering** • May 2005

**University of Illinois at Urbana-Champaign** • Urbana, IL.

**Thesis:** “Combined Inverter Design and Motor Selection to Meet 42-V Automotive System Targets”

**Advisor:** Dr. Philip Krein.

**Graduate Studies, Engineer Specialist in Telecommunications** • December 1997

**University of Buenos Aires** • Buenos Aires, Argentina.

**Electrical Engineer degree** (equivalent to an advanced B.S. degree in power and energy systems) • February 1993

**Buenos Aires Institute of Technology** • Buenos Aires, Argentina.

### **ACADEMIC POSITIONS:**

**The University of Texas at Austin:** August 2007 to Present

Associate Professor with tenure at the Department of Electrical and Computer Engineering since September 2013. Previous rank: Assistant Professor.

**Instituto Tecnológico de Buenos Aires (ITBA):** March 1999 to June 2002

Part time instructor

### **OTHER PROFESSIONAL EXPERIENCE:**

**Google Inc.:** June 2013 to August 2013

Visiting Faculty - Hardware Engineer.

**Tyco Electronics Power Systems** (formerly Lucent Technologies Power Systems, now GE Energy): March 2000 to July 2002

Senior Technical Consultant.

**Lucent Technologies Power Systems:** April 1997 to March 2000

Senior Technical Support Engineer for Lucent’s communications power plants in Latin America.

**Telefónica of Argentina:** August 1993 to April 1997

Planning Engineer and Outside Plant Network Designer.

### **HONORS AND AWARDS:**

- 2012 IEEE International Conference on Renewable Energy Research and Applications (ICRERA), **Outstanding Paper Award** for A. Toliyat, A. Kwasinski and F. M. Uriarte, "Effects of high penetration levels of residential photovoltaic generation: Observations from field data" (November 2012).
- **IBM Faculty Innovation Award** (December 2011)

- **National Science Foundation CAREER Award #0845828** “Highly-Available Power Supply through Distributed Generation Technologies: Reliability Analysis Framework Based on Operation under Critical Conditions” (2009)
  - 2009 International Telecommunications Energy Conference **Outstanding Paper**: “Telecommunications Outside Plant Power Infrastructure: Past Performance and Technological Alternatives for Improved Resilience to Hurricanes” (October 2009)
  - 2007 International Telecommunications Energy Conference **Best Technical Paper Award**: “Telecom Power Planning for Natural and Man-Made Disasters” (October 2007)
  - **Joseph J. Suozzi INTELEC Fellowship in Power Electronics** – supported by the IEEE Power Electronics Society (May 2005)
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- **Peers and Public Recognition**
  - Invited member of the ASCE TCLEE team that performed field damage assessments after the following events:
    - M<sub>w</sub> 9.0 Tohoku, Japan, earthquake and tsunami of March 11, 2011
    - M<sub>w</sub> 6.3 Christchurch, New Zealand, earthquake of February 22, 2011
    - M<sub>w</sub> 8.8 Maule, Chile, earthquake and tsunami of February 27, 2010
  - Invited participant at the following DoE roadmap and technology planning workshops:
    - July 2012: "Microgrids"
    - August 2011: “Microgrids”
    - October 2008: “Routing Telecom and Datacenters towards Efficient Energy Use.”  
Presenter of “Academic Research in Datacenters and Telecommunications Power.”
  - Invited Associate Editor for the IEEE Transactions on Power Electronics, special issue on dc distribution systems.
  - Author of the IEEE Spectrum article entitled “Disaster Forensics.”
  - Front cover paper: A. Kwasinski, W. Weaver, P. Chapman, and P. T. Krein, “Telecommunications power plant damage assessment caused by Hurricane Katrina - Site survey and follow-up results,” IEEE Systems Journal, vol. 3, no. 3, pp. 277-287, September 2009.

## PUBLICATIONS

### A. Refereed Archival Journal Publications

- J.1. S.-Y. Yu and A. Kwasinski, “Analysis of Soft-switching Isolated Time-sharing Multiple-input Converters for dc Distribution Systems,” IEEE Transactions on Power Electronics. vol. 28, issue 4, pp. 1783 – 1794, April 2013. <http://dx.doi.org/10.1109/TPEL.2012.2211040>
- J.2. J. Song, V. Krishnamurthy, A. Kwasinski, and R. Sharma, “Development of a Markov Chain Based Energy Storage Model for Power Supply Availability Assessment of Photovoltaic Generation Plants,” IEEE Transactions on Sustainable Energy, vol. 4, issue 2, pp. 491 – 500, April 2013, <http://dx.doi.org/10.1109/TSTE.2012.2207135>.
- J.3. L. Dueñas-Osorio and A. Kwasinski, “Quantification of Lifeline System Interdependencies after the 27 February 2010 Mw 8.8 Offshore Maule, Chile Earthquake.” Earthquake Spectra, vol. 28, no. S1, pp. S581-S603, June 2012, <http://dx.doi.org/10.1193/1.4000054>.

- J.4. F. M. Uriarte, A. L. Gattozzi, H. Estes, T. Hotz, J. Herbst, A. Kwasinski, and R. Hebner, "DC Arc Model for Series Faults in Low Voltage Microgrids." IEEE Transactions on Smart Grid, vol. 3, no. 4, pp. 2063 – 2070, Dec. 2012. <http://dx.doi.org/10.1109/TSG.2012.2201757>.
- J.5. S. Bae and A. Kwasinski, "Dynamic Modeling and Operation Strategy for a Microgrid with Wind and Photovoltaic Resources," IEEE Transactions on Smart Grid, vol. 3, no. 4, pp. 1867 – 1876, Dec. 2012. <http://dx.doi.org/10.1109/TSG.2012.2198498>.
- J.6. A. Kwasinski, V. Krishnamurthy, J. Song, and R. Sharma, "Availability Evaluation of Micro-Grids for Resistant Power Supply During Natural Disasters," IEEE Transactions on Smart Grid, vol. 3, no. 4, pp. 2007 - 2018, Dec. 2012. <http://dx.doi.org/10.1109/TSG.2012.2197832>.
- J.7. R. Vicini, O. Micheloud, H. Kumar, and A. Kwasinski, "Transformer and home energy management systems to lessen electrical vehicle impact on the grid," IET Generation, Transmission & Distribution, vol. 6, no. 12, pp. 1202 – 1208, Dec. 2012. <http://dx.doi.org/10.1049/iet-gtd.2012.0286>
- J.8. A. Kwasinski and A. Kwasinski, "Signal Processing in the Electrification of Vehicular Transportation: Techniques for Electric and Plug-In Hybrid Electric Vehicles on the Smart Grid," IEEE Signal Processing Magazine, vol. 29, no. 5, pp. 14-23, September 2012. <http://dx.doi.org/10.1109/MSP.2012.2186645>
- J.9. C. Onwuchekwa and A. Kwasinski, "A Modified-Time-Sharing Switching Technique for Multiple-Input DC-DC Converters," IEEE Transactions on Power Electronics, vol. 27, no. 11, pp. 4492 - 4502, November 2012. <http://dx.doi.org/10.1109/TPEL.2011.2180740>
- J.10. S. Bae and A. Kwasinski, "Spatial and Temporal Model of Electric Vehicle Charging Demand," IEEE Transactions on Smart Grid, vol. 3, no. 1, pp. 394-403, March 2012. <http://dx.doi.org/10.1109/TSG.2011.2159278>
- J.11. S. Chun and A. Kwasinski, "Analysis of Classical Root-Finding Methods Applied to Digital Maximum Power Point Tracking for Sustainable Photovoltaic Energy Generation," IEEE Transactions on Power Electronics, vol. 26, no. 12, pp. 3730-3743, December 2011. <http://dx.doi.org/10.1109/TPEL.2011.2157707>
- J.12. A. Kwasinski, "Quantitative Evaluation of DC Microgrids Availability: Effects of System Architecture and Converter Topology Design Choices," IEEE Transactions on Power Electronics, vol. 26, no. 3, pp. 835-851, March 2011. <http://dx.doi.org/10.1109/TPEL.2010.2102774>
- J.13. A. Kwasinski and C. N. Onwuchekwa, "Dynamic Behavior and Stabilization of DC Microgrids with Instantaneous Constant-Power Loads," IEEE Transactions on Power Electronics, vol. 26, no. 3, pp. 822-834, March 2011. <http://dx.doi.org/10.1109/TPEL.2010.2091285>
- J.14. C. N. Onwuchekwa and A. Kwasinski, "Analysis of Boundary Control for Buck Converters with Instantaneous Constant-Power Loads," IEEE Transactions on Power Electronics, vol. 25, no. 8, pp. 2018-2032, August 2010. <http://dx.doi.org/10.1109/TPEL.2010.2045658>
- J.15. S. Bae, A. Kwasinski, M. M. Flynn, and R. E. Hebner, "High-Power Pulse Generator with Flexible Output Pattern." IEEE Transactions on Power Electronics, vol. 25, no. 7, pp. 1675-1684, July 2010. <http://dx.doi.org/10.1109/TPEL.2010.2041012>
- J.16. A. Kwasinski, "Technology Planning for Electric Power Supply in Critical Events Considering a Bulk Grid, Backup Power Plants, and Micro-Grids," IEEE Systems Journal, vol. 4, no. 2, pp. 167-178, June 2010. <http://dx.doi.org/10.1109/JSYST.2010.2047034>
- J.17. A. Kwasinski, W. W. Weaver, P. L. Chapman, and P. T. Krein, "Telecommunications Power Plant Damage Assessment for Hurricane Katrina - Site Survey and Follow-Up Results," IEEE Systems Journal, vol. 3, no. 3, pp. 277-287, September 2009. Paper in Cover <http://dx.doi.org/10.1109/JSYST.2009.2026783>

- J.18. A. Kwasinski, "Identification of Feasible Topologies for Multiple-Input DC-DC Converters," IEEE Transactions on Power Electronics, vol. 24, no. 3, pp. 856-861, March 2009. <http://dx.doi.org/10.1109/TPEL.2008.2009538>
- J.19. A. Kwasinski and P. T. Krein, "An Integrated 42-V Drive Design for Automobile Loads with a Low-Distortion Overmodulation Strategy," in IEEE Transactions on Power Electronics, vol. 21, no. 3, pp. 648-658, May 2006. <http://dx.doi.org/10.1109/TPEL.2006.872387>
- J.20. A. Kwasinski, P. T. Krein, and P. Chapman, "Time Domain Comparison of Pulse-Width Modulation Schemes," in IEEE Power Electronics Letters, vol. 1, no. 3, pp. 64-68, September 2003. <http://dx.doi.org/10.1109/LPEL.2003.822370>

#### Submitted and under review

- Alex Tang, Alexis Kwasinski, John Eiding, Colin Foster, and Pete Anderson, "Telecommunication Systems Performance - Christchurch Earthquakes" submitted to Earthquake Spectra.
- Alexis Kwasinski, John Eiding, Alex Tang, and Christophe TUDO-Bornarel, "Performance of Electric Power Systems in the 2010-2011 Christchurch New Zealand Earthquake Sequence" submitted to Earthquake Spectra.
- M. Kim, R. Zhao, and A. Kwasinski, "DC Power Architecture with Active Power Distribution Nodes," submitted to IEEE Transactions on Smart Grid.

#### **B. Refereed Conference Proceedings**

- C.1. V. Krishnamurthy and A. Kwasinski, "Characterization of Power System Outages Caused by Hurricanes through Localized Intensity Indices," in Proc. IEEE Power and Energy Society General Meeting, Vancouver, BC, Canada, July 2013.
- C.2. A. Kwasinski and A. Kwasinski, "Architecture for Green Mobile Network Powered from Renewable Energy in Microgrid Configuration," in Proc. IEEE Wireless Communications and Networking Conference, Shanghai, China, April, 2013, pp. 1525-3511. <http://dx.doi.org/10.1109/WCNC.2013.6554747>
- C.3. Guanyu Ding and Alexis Kwasinski, "Digital Constant on-Time Controlled Multiple-Input Buck and Buck-Boost Converters" in Proc. APEC 2013, Long Beach, CA, March 2013, pp. 1376 - 1382. <http://dx.doi.org/10.1109/APEC.2013.6520479>
- C.4. Sheng-Yang Yu and Alexis Kwasinski, "Investigation of Multiple-Input Converters Bi-Directional Power Flow Characteristics," in Proc. APEC 2013, Long Beach, CA, March 2013, pp. 1095 - 1102. <http://dx.doi.org/10.1109/APEC.2013.6520436>
- C.5. A. Toliyat, A. Kwasinski and F. M. Uriarte, "Effects of high penetration levels of residential photovoltaic generation: Observations from field data," in Proc. 1st IEEE International Conference on Renewable Energy Research and Applications (ICRERA), Nagasaki, Japan, November 2012 <http://dx.doi.org/10.1109/ICRERA.2012.6477269>.
- C.6. Y. Yu and A. Kwasinski, "Multiple-input Soft-switching Converters in Renewable Energy Applications," in Proc. IEEE ECCE 2012, Raleigh, North Carolina, September, 2012, pp. 1711 - 1718. <http://dx.doi.org/10.1109/ECCE.2012.6342606>.
- C.7. A. Kwasinski, "Technological assessment of power supply options for communication sites operating in grid-islanded environments," in Proc. IEEE INTELEC 2012, October 2012, Scottsdale, Arizona.
- C.8. J. Song, V. Krishnamurthy, A. Kwasinski, and R. Molina, "Analysis of the Energy Storage Operation of Electrical Vehicles with a Photovoltaic Roof using a Markov Chain Model," in Proc.

- IEEE Vehicle Power and Propulsion Conference, October 2012, Seoul, Korea, pp. 820 – 825.  
<http://dx.doi.org/10.1109/VPPC.2012.6422733>.
- C.9. A. Kwasinski, “Technological assessment of distributed generation systems operation during extreme events,” in Proc. IEEE PEDG 2012, Aalborg, Denmark, June 26, 2012, pp. 534 – 541.  
<http://dx.doi.org/10.1109/PEDG.2012.6254054>.
- C.10. R. Zhao and A. Kwasinski, “Controller analysis for active distribution nodes in advanced dc power systems,” in Proc. IEEE COMPEL 2012, Kyoto, Japan, June 13, 2012.  
<http://dx.doi.org/10.1109/COMPEL.2012.6251734>.
- C.11. J. Song, M. C. Bozchalui, A. Kwasinski, and R. Sharma, “Microgrids Availability Evaluation using a Markov Chain Energy Storage Model: a Comparison Study in System Architectures,” in Proc. 2012 IEEE PES Transmission & Distribution Conference & Exposition, Orlando, FL, USA, May 7-10, 2012. <http://dx.doi.org/10.1109/TDC.2012.6281637>.
- C.12. A. Kwasinski and A. Tang, “Telecommunications Performance in the M=9.0 Off-shore East Coast of Japan Earthquake and Tsunami, March 11, 2011,” Japan Society of Civil Engineers’ International Symposium on Engineering Lessons Learned from the Giant Earthquake, Tokyo, Japan, March 4, 2012.
- C.13. S-Y. Yu and A. Kwasinski, “Analysis of a Soft-Switching Technique for Isolated Time-Sharing Multiple-Input Converters,” in Proc. APEC 2012, pp. 844-851, Orlando, FL, USA, February 5-9, 2012. <http://dx.doi.org/10.1109/APEC.2012.6165917>
- C.14. R. Zhao and A. Kwasinski, “Analysis of Decentralized Controller for Multiple-Input Converters,” in Proc. APEC 2012, pp. 1853-1860, Orlando, FL, USA, February 5-9, 2012.  
<http://dx.doi.org/10.1109/APEC.2012.6166074>
- C.15. F. M. Uriarte, H. B. Estes, T. J. Hotz, A. L. Gattozzi, J. D. Herbst, A. Kwasinski, and R. E. Hebner, “Development of a Series Fault Model for DC Microgrids,” in Proc. 2012 IEEE PES Innovative Smart Grid Technologies Conference, 8 pages, Washington, DC, USA, January 16-20, 2012.  
<http://dx.doi.org/10.1109/ISGT.2012.6175802>
- C.16. A. Kwasinski, “Field Damage Assessments as a Design Tool for Information and Communications Technology Systems that are Resilient to Natural Disasters,” in Proc. the 4th International Symposium on Applied Sciences in Biomedical and Communication Technologies (ISABEL), 6 pages, Barcelona, Spain, October 2011. **Invited paper.** <http://dx.doi.org/10.1145/2093698.2093856>
- C.17. H. B. Estes, A. Kwasinski, R. E. Hebner, F. M. Uriarte, and A. L. Gattozzi, “Open Series Fault Comparison in AC & DC Micro-Grid Architectures,” in Proc. INTELEC 2011, 6 pages, Amsterdam, Netherlands, October 9-13, 2011. <http://dx.doi.org/10.1109/INTLEC.2011.6099883>
- C.18. S.-Y. Yu and A. Kwasinski, “Realization and Comparison of a New Push-Pull Direct-Connected Multiple-Input Converter Family for Distributed Generation Applications,” in Proc. INTELEC 2011, 8 pages, Amsterdam, Netherlands, October 9-13, 2011.  
<http://dx.doi.org/10.1109/INTLEC.2011.6099820>
- C.19. A. Kwasinski, “Effects of Notable Natural Disasters from 2005 to 2011 on Telecommunications Infrastructure: Lessons from On-Site Damage Assessments,” in Proc. INTELEC 2011, 9 pages, Amsterdam, Netherlands, October 9-13, 2011. <http://dx.doi.org/10.1109/INTLEC.2011.6099777>
- C.20. C. N. Onwuchekwa and A. Kwasinski, “Dynamic Behavior of Single-Phase Full-Wave Uncontrolled Rectifiers with Instantaneous Constant-Power Loads,” in Proc. 2011 IEEE ECCE, pp. 3472-3479, Phoenix, AZ, USA, September 17-22, 2011.  
<http://dx.doi.org/10.1109/ECCE.2011.6064238>

- C.21. R. Zhao, S.-Y. Yu, and A. Kwasinski, "Modeling of Multiple-Input DC-DC Converters Considering Input-Coupling Effects," in Proc. 2011 IEEE ECCE, pp. 698-705, Phoenix, AZ, USA, September 17-22, 2011. <http://dx.doi.org/10.1109/ECCE.2011.6063838>
- C.22. C. N. Onwuchekwa and A. Kwasinski, "A Switching Strategy for Multiple-Input DC-DC Converters," in Proc. 2011 IEEE ECCE, pp. 3657-3664, Phoenix, AZ, USA, September 17-22, 2011. <http://dx.doi.org/10.1109/ECCE.2011.6064265>
- C.23. S.-Y. Yu, R. Zhao, and A. Kwasinski, "Design Considerations of a Multiple-Input Isolated Single Ended Primary Inductor Converter (SEPIC) for Distributed Generation Sources" in Proc. IEEE ECCE 2011, pp. 3960-3967, Phoenix, AZ, USA, September 17-22, 2011. <http://dx.doi.org/10.1109/ECCE.2011.6064308>
- C.24. J. Song, R. Zhao, and A. Kwasinski, "Design Considerations for Energy Storage Power Electronics Interfaces for High Penetration of Renewable Energy Sources," in Proc. 2011 IEEE International Conference on Power Electronics - ECCE Asia, pp. 2160-2167, Jeju, South Korea, May 30, 2011-June 3, 2011. **Invited paper.** <http://dx.doi.org/10.1109/ICPE.2011.5944409>
- C.25. A. Kwasinski, "Advanced Power Electronics Enabled Distribution Architectures: Design, Operation, and Control," in Proc. 2011 IEEE International Conference on Power Electronics - ECCE Asia, pp. 1484-1491, Jeju, South Korea, May 30, 2011-June 3, 2011. **Invited paper.** <http://dx.doi.org/10.1109/ICPE.2011.5944475>
- C.26. A. Kwasinski, "Local Energy Storage as a Decoupling Mechanism for Interdependent Infrastructures," in Proc. 2011 IEEE International Systems Conference, pp. 435-441, Montreal, QC, Canada, April 4-7, 2011. <http://dx.doi.org/10.1109/SYSCON.2011.5929079>
- C.27. V. Sule and A. Kwasinski, "Active Anti-Islanding Method Based on Harmonic Content Detection from Overmodulating Inverters," in Proc. IEEE APEC 2011, pp. 637-644, Fort Worth, TX, USA, March 6-11, 2011. <http://dx.doi.org/10.1109/APEC.2011.5744663>
- C.28. S. Chun and A. Kwasinski, "Modified Regula Falsi Optimization Method Approach to Digital Maximum Power Point Tracking for Photovoltaic Application," in Proc. IEEE Applied Power Electronics Conference (APEC) 2011, pp. 280-286, Fort Worth, TX, USA, March 6-11, 2011. <http://dx.doi.org/10.1109/APEC.2011.5744609>
- C.29. J. Jung and A. Kwasinski, "A Multiple-Input SEPIC with a Bi-Directional Input for Modular Distributed Generation and Energy Storage Integration," in Proc. IEEE Applied Power Electronics Conference (APEC) 2011, pp. 28-34, Fort Worth, TX, USA, March 6-11, 2011. <http://dx.doi.org/10.1109/APEC.2011.5744571>
- C.30. S-Y Yu, J. Song, and A. Kwasinski, "A Multiple-Input Current-Source Converter for a Stand-Alone Hybrid Power System," in Proc. IEEE Applied Power Electronics Conference (APEC) 2011, pp. 35-40, Fort Worth, TX, USA, March 6-11, 2011. <http://dx.doi.org/10.1109/APEC.2011.5744572>
- C.31. C. N. Onwuchekwa and A. Kwasinski, "Analysis of Boundary Control for Boost and Buck-Boost Converters in Distributed Power Architectures with Constant-Power Loads," in Proc. IEEE Applied Power Electronics Conference (APEC) 2011, pp. 1816-1823, Fort Worth, TX, USA, March 6-11, 2011. <http://dx.doi.org/10.1109/APEC.2011.5744843>
- C.32. C. N. Onwuchekwa and A. Kwasinski, "Analysis of Boundary Control for a Multiple-Input DC-DC Converter Topology," in Proc. IEEE APEC 2011, pp. 1232-1237, Fort Worth, TX, USA, March 6-11, 2011. <http://dx.doi.org/10.1109/APEC.2011.5744750>
- C.33. A. Kwasinski, "Towards a 'Power-Net': Impact of Smart Grids Development for ICT Networks During Critical Events," in Proc. 3rd International Symposium on Applied Sciences in Biomedical

- and Communication Technologies ISABEL 2010, 8 pages, Rome, Italy, November 7-10, 2010. **Invited paper.** <http://dx.doi.org/10.1109/ISABEL.2010.5702816>
- C.34. J. Song, A. Toliyat, D. Tuttle, and A. Kwasinski, "A Rapid Charging Station with an Ultracapacitor Energy Storage System for Plug-In Electrical Vehicles," in Proc. ICEMS 2010, pp. 2003-2007, Incheon, South Korea, October 10-13, 2010. [http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=5663477&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxppls%2Fabs\\_all.jsp%3Farnumber%3D5663477](http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=5663477&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxppls%2Fabs_all.jsp%3Farnumber%3D5663477)
- C.35. S. H. Choung and A. Kwasinski, "Multiple-Input Modified Inverse Watkins-Johnson Converter without Coupled Inductors" in Proc. ECCE 2010, pp. 3253-3260, Atlanta, GA, USA, September 12-16, 2010. <http://dx.doi.org/10.1109/ECCE.2010.5617770>
- C.36. A. Kwasinski and C. N. Onwuchekwa, "Effects of Instantaneous Constant-Power Loads on DC Micro-Grids for Sustainable Power Systems," in Proc. International Power Electronics Conference (IPEC), 2010, pp. 862-869, Sapporo, Japan, June 21-24, 2010. **Invited paper.** <http://dx.doi.org/10.1109/IPEC.2010.5543339>
- C.37. A. Kwasinski, "Power Electronic Interfaces for Ultra Available DC Micro-Grids," in Proc. 2010 Power Electronics for Distributed Generation Systems (PEDG), pp. 58-65, Hefei, China, June 16-18, 2010. **Invited paper.** <http://dx.doi.org/10.1109/PEDG.2010.5545905>
- C.38. A. Kwasinski, "Implication of Smart-Grids Development for Communication Systems in Normal Operation and During Disasters," in Proc. INTELEC 2010, 8 pages, Orlando, FL, USA, June 6-10, 2010, <http://dx.doi.org/10.1109/INTLEC.2010.5525678>
- C.39. A. Kwasinski, "Analysis of Vulnerabilities of Telecommunication Systems to Natural Disasters," in Proc. 2010 IEEE Systems Conference, pp. 359-364, San Diego, CA, USA, April 5-8, 2010. <http://dx.doi.org/10.1109/SYSTEMS.2010.5482356>
- C.40. J. Song and A. Kwasinski, "Analysis of the Effects of Duty Cycle Constraints in Multiple-Input Converters for Photovoltaic Applications," in Proc. INTELEC 2009, 5 pages, Incheon, South Korea, October 18-22, 2009. <http://dx.doi.org/10.1109/INTLEC.2009.5351817>
- C.41. S. Bae and A. Kwasinski, "Maximum Power Point Tracker for a Multiple-Input Ćuk DC-DC Converter," in Proc. INTELEC 2009, 5 pages, Incheon, South Korea, October 18-22, 2009. <http://dx.doi.org/10.1109/INTLEC.2009.5351942>
- C.42. C. N. Onwuchekwa and A. Kwasinski, "Boundary Control of Buck Converters with Constant-Power Loads," in Proc. INTELEC 2009, 6 pages, Incheon, South Korea, October 18-22, 2009. <http://dx.doi.org/10.1109/INTLEC.2009.5351975>
- C.43. A. Kwasinski, "Telecom Power Planning for Natural Disasters: Technology Implications and Alternatives to U.S. Federal Communications Commission's 'Katrina Order' in View of the Effects of 2008 Atlantic Hurricane Season," in Proc. INTELEC 2009, 6 pages, Incheon, South Korea, October 18-22, 2009. <http://dx.doi.org/10.1109/INTLEC.2009.5352094>
- C.44. A. Kwasinski, "Telecommunications Outside Plant Power Infrastructure: Past Performance and Technological Alternatives for Improved Resilience to Hurricanes," in Proc. INTELEC 2009, 6 pages, Incheon, South Korea, October 18-22, 2009. **Selected as an Outstanding Paper.** <http://dx.doi.org/10.1109/INTLEC.2009.5352092>
- C.45. R. Zhao and A. Kwasinski, "Multiple-Input Single Ended Primary Inductor Converter (SEPIC) Converter for Distributed Generation Applications," in Proc. ECCE 2009, pp. 1847-1854, San Jose, CA, USA, September 20-24, 2009. <http://dx.doi.org/10.1109/ECCE.2009.5316295>



- C.46. A. Kwasinski, "U.S. Gulf Coast Telecommunications Power Infrastructure Evolution since Hurricane Katrina," in Proc. International Telecommunication Energy Special Conference, 2009, 6 pages, Vienna, Austria, May 10-13, 2009.  
[http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=5758978&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxppls%2Fabs\\_all.jsp%3Farnumber%3D5758978](http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=5758978&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxppls%2Fabs_all.jsp%3Farnumber%3D5758978)
- C.47. A. Kwasinski, "Evaluation of dc Voltage Levels for Integrated Information Technology and Telecom Power Architectures," in Proc. International Telecommunication Energy Special Conference, 2009, 7 pages, Vienna, Austria, May 10-13, 2009.  
[http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=5758963&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxppls%2Fabs\\_all.jsp%3Farnumber%3D5758963](http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=5758963&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxppls%2Fabs_all.jsp%3Farnumber%3D5758963)
- C.48. S. H. Choung and A. Kwasinski, "Multiple-Input DC-DC Converter Topologies Comparison," in Proc. IECON 2008, pp. 2359-2364, Orlando, FL, USA, November 10-13, 2008.  
<http://dx.doi.org/10.1109/IECON.2008.4758325>
- C.49. B. Le and A. Kwasinski, "Analysis of a Flexible and Rugged Photovoltaic-Based Power System," in Proc. INTELEC 2008, vol. 19, no. 5, pp. 1-7, San Diego, CA, USA, September 14-18, 2008.  
<http://dx.doi.org/10.1109/INTLEC.2008.4664074>
- C.50. A. Kwasinski, "Analysis of Electric Power Architectures to Improve Availability and Efficiency of Air Conditioning Systems," in Proc. INTELEC 2008, vol. 10, no. 2, pp. 1-8, San Diego, CA, USA, September 14-18, 2008. <http://dx.doi.org/10.1109/INTLEC.2008.4664046>
- C.51. A. Kwasinski and P. T. Krein, "Telecom Power Planning for Natural and Man-Made Disasters," in Proc. 2007 International Telecommunications Energy Conference (INTELEC), pp. 216-222, Rome, Italy, September 30-October 4, 2007. – **Best Paper Award** –  
<http://dx.doi.org/10.1109/INTLEC.2007.4448770>
- C.52. A. Kwasinski and P. T. Krein, "Stabilization of Constant Power Loads in DC-DC Converters Using Passivity-Based Control," in Proc. 2007 International Telecommunications Energy Conference (INTELEC), pp. 867-874, Rome, Italy, September 30-October 4, 2007.  
<http://dx.doi.org/10.1109/INTLEC.2007.4448903>
- C.53. A. Kwasinski and P. T. Krein, "Passivity-Based Control of Buck Converters with Constant-Power Loads," in Proc. Power Electronics Specialist Conference 2007 (PESC), pp. 259-265, Orlando, FL, USA, June 17-21, 2007. <http://dx.doi.org/10.1109/PESC.2007.4341998>
- C.54. A. Kwasinski and P. T. Krein, "Multiple-Input DC-DC Converters to Enhance Local Availability in Grids Using Distributed Generation Resources," in Proc. 2007 Applied Power Electronics Conference (APEC), pp. 1657-1663, Anaheim, CA, USA, February 25-March 1, 2007.  
<http://dx.doi.org/10.1109/APEX.2007.357741>
- C.55. A. Kwasinski, W. Weaver, P. Chapman, and P. T. Krein, "Telecommunications Power Plant Damage Assessment Caused by Hurricane Katrina - Site Survey and Follow-up Results," in Proc. 2006 International Telecommunications Energy Conference (INTELEC), pp. 388-395, Providence, RI, USA, September 10-14, 2006. <http://dx.doi.org/10.1109/INTLEC.2006.251644>
- C.56. A. Kwasinski and P. T. Krein, "Optimal Configuration Analysis of a Microgrid-Based Telecom Power System," in Proc. 2006 International Telecommunications Energy Conference (INTELEC), pp. 602-609, Providence, RI, USA, September 10-14, 2006.  
<http://dx.doi.org/10.1109/INTLEC.2006.251676>
- C.57. A. Kwasinski and P. T. Krein, "A Microgrid-Based Telecom Power System using Modular Multiple-Input DC-DC Converters," in Proc. 2005 International Telecommunications Energy

Conference (INTELEC), pp. 515-520, Berlin, Germany, September 2005.  
<http://dx.doi.org/10.1109/INTLEC.2005.335152>

- C.58. A. Kwasinski and P. T. Krein, “Combined Inverter Design and Motor Selection to Meet 42V Automotive System Targets,” in Proc. 5th IEMDC, pp. 1311-1318, San Antonio, TX, USA, May 15, 2005. <http://dx.doi.org/10.1109/IEMDC.2005.195892>
- C.59. A. Kwasinski and P. T. Krein, “An Integrated Approach to PWM through 3-Dimensional Visualization,” in Proc. 35th Annual IEEE Power Electronics Specialists Conference, vol. 6, pp. 4202-4208, Aachen, Germany, June 20-25, 2004. <http://dx.doi.org/10.1109/PESC.2004.1354743>

#### Upcoming:

- A. Kwasinski, “Effects of Hurricanes Isaac and Sandy on Data and Communications Power Infrastructure,” to be presented at IEEE INTELEC 2013, October 2013, Hamburg, Germany.
- R. Zhao and A. Kwasinski, “Efficiency Improvement of a Low-Power Multiple-Input Converter with Forward-Conducting-Bidirectional-Blocking Switches,” to be presented at IEEE Energy Conversion Congress and Exposition (ECCE), Denver, CO, September 2013.

#### C. Other Major Publications

- A. Kwasinski, “Lessons from Field Damage Assessments about Communication Networks Power Supply and Infrastructure Performance during Natural Disasters with a focus on Hurricane Sandy,” FCC Proceeding Docket number 11-60 “In the matter of reliability and continuity of Communications Networks, Including Broadband technologies effects on Broadband Communications Networks of Damage or Failure of Network equipment or severe overload.” February, 2013.
- F. Uriarte, et. al. "Technical Cross-fertilization between Terrestrial Microgrids and Ship Power Systems" presented at ESRDC 10th Anniversary Meeting, June 5, 2012, Austin, Texas.
- A. Kwasinski, “Disaster Forensics,” IEEE Spectrum (online issue), December 2011. <http://spectrum.ieee.org/energy/the-smarter-grid/disaster-forensics/0>
- B. Fahimi, A. Kwasinski, A. Davoudi, R. S. Balog, and M. Kiani, “Charge It!,” IEEE Power and Energy Magazine, vol. 9, no. 4, pp. 54-64, July/August 2011. <http://dx.doi.org/10.1109/MPE.2011.941321>

#### D. Books, Chapters of Books; Editor of Books

- A. Kwasinski, W. Weaver, and R. Balog, “Micro-grids in Local Area Power and Energy Systems,” Cambridge University Press. Under contract. Expected publication late Spring 2014.
- N. Marchetti, editor, “Telecommunications in Disaster Areas,” (Rivers Publishers, ISBN: 978-87-92329-48-6) Chapter 3: “Power Supply and Communications Infrastructure Issues in Disaster Areas,” November 2010.

#### E. Technical Reports

- Reports involving current projects:
  - Quarterly reports for the ESRDC
  - Annual reports for the NSF project “CAREER: Highly-available Power Supply through Distributed Generation Technologies: Reliability Analysis Framework Based on Operation under Critical Conditions.”
- A. Kwasinski, “Solarbridge Project Report” prepared for Solarbridge, Austin, TX, January 2012.
- S. W. Bae and A. Kwasinski, “Empirical Evaluation of a Plug-in Electric Motorcycle: Urban and Hilly Roads,” prepared for KLD Energy, Inc., December 2011.

- J. Song and A. Kwasinski, “Development of a Markov Chain Based Energy Storage Model for Power Supply Availability Assessment of Power Generation Plants with Renewable Energy,” prepared for NEC Labs, November 2011.
- Member of ASCE TCLEE team that performed the damage assessment after the March 2011 Great Tohoku Region, Japan, earthquake and tsunami. Contributor to the following chapters in ASCE's TCLEE Monograph:
  - Infrastructures Interdependencies (Leader: Alexis Kwasinski).
  - Telecommunications (Leader: Alexis Kwasinski).
  - Power Systems (Leader: Leon Kempner).
  - Emergency Response and Social Impact (Leader: Alexis Kwasinski).
- Member of ASCE TCLEE team that performed the damage assessment after the February 2011 Christchurch, New Zealand, earthquake. Contributor to the following chapters in ASCE's TCLEE Monograph:
  - Telecommunications (Leader: Alex Tang).
  - Power Systems (Leader: John Eidinger).
- Contributor to the following chapters for the ASCE's TCLEE Technical Report “Mw8.8 Maule, Chile Earthquake of February 27, 2010 Lifeline Performance”:
  - Infrastructures interdependencies (Leader: Leonardo Duenas Ozorio).
  - Telecommunications (Leader: Alex Tang).
  - Power Systems (Leader: Anshel Schiff).
- A. Kwasinski, “Power Electronic Interface for Ocean Energy Extraction” prepared for Sara Inc., Cypress, CA, December 2008.
- A. Kwasinski, W. Weaver, P. Chapman, and P. Krein, “Hurricane Katrina: Damage Assessment of Power Infrastructure for Distribution, Telecommunication, and Backup,” Technical Report UILU-ENG-2006-2511, CEME-TR-06-05, August 2006.
- J. Kimball, M. Amrhein, A. Kwasinski, J. Mossoba, B. Nee, Z. Sorchini, W. Weaver, J. Wells, and G. Zhang, “Modular Inverter for Advanced Control Applications,” Technical Report UILU-ENG-2006-2504, CEMETR-06-01, May 2006.

## **ORAL PRESENTATIONS:**

- IEEE PES General Meeting, paper “Power infrastructure performance during natural disasters: Key lessons from field damage assessments and technology alternatives for enhanced service survivability” presented at panel “Storm Experiences: Toward Smarter and Robust Grid,” Vancouver, BC, Canada, (July, 24, 2013).
- IEEE Workshop on Preparing Information and Communication Technologies Systems for an Extreme Event; topic: “Information and Communications Technology (ICT) Systems Performance during Extreme Events,” New Brunswick, NJ, (July 16, 2013)
- IEEE GreenTech Conference, panelist presenting on the topic “Power Supply Lessons from Damage Assessments,” Denver, CO, (April 4, 2013)
- Invited presentation at NASA Headquarters, “Adaptation Lessons from the Study of Power Grids Performance during Hurricanes,” Washington DC (March 13, 2013)
- Invited presentation at US Army Corps of Engineers Headquarters, “Electric Power Supply Resiliency to Disasters,” Washington DC (March 13, 2013)

- FCC Workshop on Network Resiliency, “Lessons from Field Damage Assessments about Communication Networks Power Supply and Infrastructure Performance during Natural Disasters with a focus on Hurricane Sandy” Brooklyn, NY (February 6, 2013).
- International Electrotechnical Commission (IEC) “Micro-grids Role in Powering Critical Loads during Extreme Events” at Microgrids for Preparedness and Disaster Recovery (MDR) Workshop (January 31, 2012)
- INTELEC 2012, Panelist at the panel “Disaster Recovery.” (October 1, 2012, Scottsdale, Arizona)
- The Diplomatic Academy of Ukraine, “Electric Power Grids Performance under Environmental Hazards” at North American Treaty Organization (NATO) Partnership Conference on Emerging Security Challenges (September 27, 2012, Kiev, Ukraine).
- Monterrey Institute of Technology, Mexico, “Electrical Energy Utilization: Realities and Future Prospects” at Segundo Congreso Energy: La Riqueza Energética de México (September 20, 2012, Monterrey, Nueva Leon, Mexico).
- IEEE Central Texas Section Power and Energy Society Austin Chapter, “Disaster Forensics” (April 24, 2012, Austin, TX)
- Massachusetts Institute of Technology, “Power Electronic Systems Research at The University of Texas at Austin” (April 20, 2012, Cambridge, MA)
- Universidad de Chile, “Operacion de Micro-redes en forma aislada” (April 13, 2012, Santiago de Chile, Chile)
- University of Texas, Arlington ECE department seminars “Stability and Control of dc Micro-grids” (March 8, 2012, Arlington, TX)
- Intel, “Home Energy Management Research at The University of Texas at Austin” (March 13, 2012, Hillsboro, OR)
- Double Life of a Transformer: “Disaster Forensics” (February 9, 2012, Orlando, FL)
- Green Building Power Forum 2012, “Comparison between Series Faults in DC and AC Systems,” Co-authors: H.B. Estes, A. Kwasinski, R.E. Hebner, F.M. Uriarte, and A.L. Gattozzi (January 24, 2012, San Jose, CA)
- Lawrence Berkeley National Lab Jeju 2011 Symposium on Microgrids: Panelist in discussion entitled “Microgrids and Disasters” (June 2011, Jeju Island, South Korea)
- Lawrence Berkeley National Lab Jeju 2011 Symposium on Microgrids, “Behavior and Control of Power Electronic Interfaces in DC Microgrids,” (June 2011, Jeju Island, South Korea)
- IEEE USA Meeting: “Optimal Design in Personal Electric Transportation Systems” (March 2011, Austin, TX)
- Lineage Power, “Evaluation of Power Architectures for Data Centers” (March 2011, Dallas, TX)
- ISABEL 2010 Panelist in discussion entitled “ICT for Development and Disaster Recovery” (November 2010, Rome, Italy)
- Smart Grid Electronics Forum: Panelist in discussion entitled “Real-Time Dynamic Pricing of Electricity: Unrealistic Dream or Necessary Condition for Adoption of the Smart Grid?” (October 2010, San Jose, CA)
- INTELEC 2010: Participant in Panel Disaster Recovery and Grid Security Panel (June, 2010, Orlando, FL)
- National Hurricane Conference: “Impact of Hurricanes on Communication Systems” (April 2010, Orlando, FL)
- Green Building Power Forum, “Comparison of Distributed Generation Sources Interfaces for DC Micro Grids” (January 2010, Anaheim, CA)

- Samsung Electronics, “Photovoltaic Power Generation in Smart Grids: Challenges and Alternative Technological Solutions” (October 2009, Seoul, South Korea)
- LG, “Smart-grid: Present Status, Issues, and Future” (October 2009, Seoul, South Korea)
- Green Building Power Forum, “DC Homes and Improved Power Resiliency. Evaluation of Electric Architectures for Enhanced Power Supply Resiliency to Hurricanes of Utility, ICT, Commercial, and Residential Systems” (June 2009, Anaheim, CA)
- Clean Texas Forum: Supercharging Data Centers. Panelist and presenter (October 2008, Austin, TX)
- US Department of Energy Roadmap Workshop on Routing Telecom and Datacenters Toward Efficient Energy Use: Participant and presenter of “Academic Research in Datacenters and Telecommunications Power” (October 2008, San Jose, CA)
- INTELEC 2008: Presenter at “Katrina Panel” (September 16, 2008, San Diego, CA)
- EPRI PQA/ADA Conference: Presenter “The Prospect of dc Power Distribution: Stability Issues and Solutions in dc Microgrids” (August 2008, Cleveland, OH)

### PATENTS:

- A. Kwasinski, S. W. Bae, M. M. Flynn, R. E. Hebner, M. D. Werst, S. B. Pratap, and A. S. Williams, “Bipolar solid state Marx generator,” US Patent US 2011/0065161 A1 (March 17, 2011), International Application No.: PCT/US2010/048781.
- A. Kwasinski and S.-Y. Yu “Multiple-Input Isolated Push-Pull Connected Power Converters” U.S. Patent application 13/966,534.
- A. Kwasinski, S.-Y. Yu and R. Zhao, “Multiple-Input Soft-Switching Power Converters” U.S. Patent application 13/931,616.

### FUNDING:

#### Grants and Contracts:

Co-Investigators	Title	Agency	Grant Total (share)*	Grant Period
K. Davey (PI)	Ocean Energy Extraction for Sensor Applications	SARA, Inc.	\$18,736 (\$18,736)*	07/2008 - 04/2009
R. Hebner (PI)	Algae Program	Organic Fuels Algae Technologies	\$50,010 (\$50,010)*	11/2008 - 05/2009
None	CAREER: Highly-available Power Supply through Distributed Generation Technologies: Reliability Analysis Framework Based on Operation Under Critical Conditions	NSF	\$400,000 (\$400,000)	06/2009 - 05/2014
R. Baldick, S. Barber, T. Edgar (PI), and M. Webber	IGERT: Sustainable Grid Integration of Distributed and Renewable Resources	NSF	\$3,070,531 (\$614,106)	07/2010 - 06/2015
R. Hebner (PI)	Electric Ship Research and Development Consortium	ONR (subcontract FSU)	\$168,737 (\$168,737)*	09/2002 - 08/2013

Co-Investigators	Title	Agency	Grant Total (share)*	Grant Period
T. Edgar (PI)	Smart Grid Demonstration Project	DOE (subcontract Pecan Street, Inc.)	\$2,575,505 (\$559,482)	02/2010 - 02/2015
None	Austin Manufacturing Facility with Electric Technology Center and Applications Lab (Part I)	KLD Energy	\$53,250 (\$53,250)	01/2009 - 12/2009
None	Austin Manufacturing Facility with Electric Technology Center and Applications Lab (Part II)	KLD Energy	\$115,144 (\$115,144)	01/2010 - 12/2011
None	Solarbridge Texas Emerging Technologies Fund Project	Solarbridge	\$113,949 (\$113,949)	09/2010 - 01/2012
		<b>TOTALS</b>	<b>\$6,565,862 (\$2,093,414)</b>	

\* For projects led by the Center for Electromechanics, only the share is considered as the total for the grant.

#### Gifts:

Co-Investigators	Project	Funding source	Gift Total (share)
None	Availability Modeling of PV and Energy Storage Resources	NEC Labs America	\$41,500 (\$41,500)
None	Smart Grid Demonstration Project (study of HEMS)	Pecan Street Inc	\$80,000 (\$80,000)
None	Faculty Innovation Award	IBM	\$10,000 (\$10,000)
Michael Webber and Robert Hebner	Evergreen Cloud	AMD	\$100,000 (\$21,666)
		<b>TOTALS</b>	<b>\$231,500 (\$153,166)</b>

**GRAND TOTALS \$6,797,362 (\$2,246,580)**

#### PH.D. SUPERVISIONS COMPLETED:

Name	Title	Year	Degree Area	Institution
Ruichen Zhao	Analysis, Modeling, and Control of Highly-Efficient Hybrid DC-DC Conversion Systems	2012	Electrical Engineering	The University of Texas at Austin
Sheng Yang Yu	Multiple-input Converters for Distributed Generation Applications	2012	Electrical Engineering	The University of Texas at Austin
Junseok Song	Energy Storage Sizing For Improved Power Supply Availability During Extreme Events Of A Microgrid With Renewable Energy Sources	2012	Electrical Engineering	The University of Texas at Austin

<b>Name</b>	<b>Title</b>	<b>Year</b>	<b>Degree Area</b>	<b>Institution</b>
Sung Woo Bae	Sustainable Microgrid and Electric Vehicle Charging Demand for a Smarter Grid	2011	Electrical Engineering	The University of Texas at Austin
Seung Hoon Choung	A Topology Development and Analysis for Multiple Input DC/DC Converter	2011	Electrical Engineering	The University of Texas at Austin
Seunghyun Chun	Analysis of Classical Root-Finding Methods Applied to Digital Maximum Power Point Tracking for Photovoltaic Energy Generation	2011	Electrical Engineering	The University of Texas at Austin
Chimaobi Nwachukwu Onwuchekwa	Analysis And Control of Power Converters with Instantaneous Constant-Power Loads	2011	Electrical Engineering	The University of Texas at Austin

**M.S. SUPERVISIONS COMPLETED:**

<b>Name</b>	<b>Title</b>	<b>Year</b>	<b>Degree Area</b>	<b>Institution</b>
Cody Hill	Grid-Scale Battery Energy Storage Systems	2013	Electrical Engineering	The University of Texas at Austin
Guanyu Ding	Digital Current Mode Control for Multiple Input Converters	2012	Electrical Engineering	The University of Texas at Austin
Greg Dahlberg	Fault Clearance in Distributed Power Architectures with Limited Energy Flow through Power Electronic Interfaces	2012	Electrical Engineering	The University of Texas at Austin
Harshad Desai	Point-of-load Converters for a Residential DC Distribution System	2012	Electrical Engineering	The University of Texas at Austin
John Cunningham <sup>(1)</sup>	Switched Reluctance Motor Drive Circuit Influence on Efficiency and Drivability Performance	2011	Electrical Engineering	The University of Texas at Austin
Hunter Estes <sup>(2)</sup>	Horizontal series fault comparison in AC & DC micro-grid architectures	2011	Electrical Engineering	The University of Texas at Austin
Amir Toliyat	Modeling and simulation of distribution system components in anticipation of a smarter electric power grid	2011	Electrical Engineering	The University of Texas at Austin
Bhargavi Devarajan	Modeling of a DC fuse for protection of semiconductor devices using PSCAD/EMTDC	2010	Electrical Engineering	The University of Texas at Austin
Vaidyanathan Krishnamurthy	Model for estimating damages on power systems due to hurricanes	2010	Electrical Engineering	The University of Texas at Austin
Harsha Kumar	Maximum power point tracking using ripple correlation control with an interleaved SEPIC converter for photovoltaic applications	2010	Electrical Engineering	The University of Texas at Austin
Sheng Yang Yu	Isolated multiple-input single ended primary inductor converter (SEPIC) and applications	2010	Electrical Engineering	The University of Texas at Austin

<b>Name</b>	<b>Title</b>	<b>Year</b>	<b>Degree Area</b>	<b>Institution</b>
Ruichen Zhao	A multiple-input single ended primary inductor converter for modular micro-grids with hybrid low-power sources	2010	Electrical Engineering	The University of Texas at Austin
Sung Woo Bae	Bipolar high power pulse generators for algae oil extraction	2009	Electrical Engineering	The University of Texas at Austin
Vaibhab Sule	Prevention of islanding of micro-grids using inverter over-modulation technique	2009	Electrical Engineering	The University of Texas at Austin
Bin Le	Analysis of a flexible and rugged photovoltaic-based power system	2008	Electrical Engineering	The University of Texas at Austin
Shyaam Raman	Hybrid energy storage systems: possible topologies and applications	2008	Electrical Engineering	The University of Texas at Austin

<sup>(1)</sup> Co-supervised with Dr. Del Tesar, <sup>(2)</sup> Co-supervised with Dr. Robert Hebner

## **PH.D. IN PROGRESS:**

### **A. Students admitted to candidacy**

Vaidyanathan Krishnamurthy

### **B. Post M.S. students preparing to take Ph.D. qualifying exam**

Juyoung Jung

Myungchin Kim

Harsha Kumar

Amir Toliyat

Hunter Estes

Mahesh Srinivasan

Rossen Tzartzev

Joon Hyun Kim

Youngsung Kwon

## **M.S. IN PROGRESS:**

Yazmine Najera

Agee Springer

## **TEACHING EXPERIENCE**

### **Faculty Member at The University of Texas at Austin**

- EE394J-11 Advanced topics in power electronics (fall 2007, 2009, 2011, and 2013)—Course creator, developer and instructor.
- EE362L/EE462L Power Electronics (spring 2008, 2009, 2010, 2011, 2012 and 2013, fall 2012)—Instructor.
- EE411 Circuit Theory (summer 2008, and fall 2009 and 2010)—Instructor.
- EE394J-10 Distributed Generation Technologies (fall 2008, 2010 and 2012)—Course creator, developer and instructor.



- EE364D Introduction to Engineering Design (spring 2011 and spring 2013)—Group supervisor.
- EE464 Senior Design (fall 2011 and fall 2013)—Group Supervisor

#### **Other Teaching Positions**

- Part time instructor in charge of the communications laboratory at the Instituto Tecnologico de Buenos Aires (1999 – 2002).
- Teaching Assistant at the University of Illinois at Urbana-Champaign
  - ECE469 Power Electronics (Laboratory) – Fall 2006.
  - ECE431 Electric Machinery – Spring 2005.

#### **Other Teaching Activities**

- Member Executive Committee NSF IGERT Sustainable Grid Integration of Distributed and Renewable Resources.
- Developed the course entitled “The Power-net. Paradigm changes towards a smarter electric power distribution” as part of my IBM Faculty Innovation Award.

### **SERVICE THE UNIVERSITY AND THE COMMUNITY**

#### **University Service**

- Chair of the Energy Systems Track curriculum committee and member of the department curriculum committee (2011 – Present)
- Member of the ECE Seminars Committee (2011 – Present)
- Member of the ECE Combined BS/MSc and Honors Sections Committee (2013–Present)
- Member of the ECE Faculty Recruitment Committee (Academic year 2011-2012).
- Member of the Service Learning Advisory Board Committee (2008 – 2009)

#### **8. Technical Societies Service**

- Associate Editor, IEEE Transactions on Energy Conversion and IEEE Transactions on Power Electronics (special issues and assistant to the editor in chief at large).
- Reviewer for the IEEE Transactions on Power Electronics, IEEE Transactions on Industry Applications, the IEEE Transactions on Power Delivery, the IEEE Transactions on Vehicular Technology, the IEEE Transactions on Energy Conversion, the IEEE Power Electronics Letters, the IEEE International Telecommunications Energy Conference, the IEEE Energy Conversion Congress and Exposition, and the Applied Power Electronics Conference.
- Chair of the 1<sup>st</sup> Workshop on Preparing Information and Communication Technologies Systems for an Extreme Event.
- Member of the IEEE Power Electronics Society Technical Committee on Sustainable Energy.
- Chair of the IEEE Power Electronics Society Committee selecting the Joseph Suozzi INTELEC Fellowship (2010 – 2012).
- Chair of the following two technical thrusts within the Technical Committee “Communications Energy Systems” of the IEEE Power Electronics Society: “Information and Communication Infrastructure Resistant to Extreme Events (ICIREE)” and

“Information and Communication Technology Facilities Power Technologies (ICT-FPT).”

- Conference Session Chairs: INTELEC, APEC, and Green Building Power Forum.
- Member of the Program Committee for INTELEC 2012, APEC 2012 and APEC 2013 as co-Chair of the dc-dc converters track.
- Student Program Chair for INTELEC 2012
- Vice Chair of the Technical Committee of Electric Power and Telecommunications of the American Society of Civil Engineers (ASCE) Technical Committee of Lifeline Earthquake Engineering.
- Chair of the 1<sup>st</sup> Workshop “Preparing Information and Communication Technologies Systems for an Extreme Event” supported by the IEEE Power Electronics Society.

### **MEMBERSHIPS IN PROFESSIONAL AND HONORARY SOCIETIES**

- Tau Beta Pi Engineering Honor Society, member
- Eta Kappa Nu Electrical Engineering Honor Society, member
- IEEE and IEEE’s Power Electronic Society (PELS), member
- IEEE’s Power and Energy Society (PES), member
- IEEE’s Industry Applications Society (IAS), member
- Professional Council of Mechanical and Electrical Engineers of Argentina, member, registered professional engineer
- American Society of Civil Engineers (ASCE), member

### **OTHER ITEMS OF INTEREST**

- Pecan Street Project: Co-Chair Customer Side of the Meter team (2010 – present) and member of Utility Side of the Meter team (2010 – present) and of the Pike Powers Home Research Lab Team (2010- 2012).
- Invited participant to DoE’s Microgrid Workshop, July 30 and 31, 2012, Chicago, Illinois.
- Participant in NSF proposal review panels and in the evaluation team for a DoE EPSCoR Implementation Award site visit (September 2011).
- Contributor for the design, construction and development of Pecan Street’s Pike Powers Research Lab (a 3-story building in the Mueller community intended to support smart grid research):
- Featured in the following articles about Superstorm Sandy:
  - D. Unger “Are renewables stormproof? Hurricane Sandy tests solar, wind.” The Christian Science Monitor, Nov. 19, 2012.
  - T. De Chant “Hurricane Sandy and the limits of the smart grid” PBS Inside Nova, Nov. 5, 2012.
  - D. Levitan “Rooftop Solar Stood Up to Sandy” IEEE Spectrum (online), Nov. 15, 2012.
  - A. Bleicher “Network Damage After Sandy Through The Eyes of A Disaster Forensics Expert” IEEE Spectrum (online), Nov. 14, 2012.

**VITA**

Alexis Kwasinski received a B.S. degree in electrical engineering from the Buenos Aires Institute of Technology (ITBA), Buenos Aires, Argentina, a graduate specialization degree in telecommunications from the University of Buenos Aires, in 1997, and the M.S. and Ph.D. degrees in electrical engineering from the University of Illinois at Urbana-Champaign in 2005 and 2007, respectively. From 1993 to 1997, he worked for Telefónica of Argentina designing and planning telephony outside plant networks. Then, from 1997 to 2002 he worked for Lucent Technologies Power Systems (later Tyco Electronics Power Systems) as a Technical Support Engineer and Sales Technical Consultant in Latin America. From 1999 to 2002, he was also a part-time instructor in charge of ITBA's telecommunications laboratory. He is currently an Associate Professor with tenure at the Department of Electrical and Computer Engineering at The University of Texas at Austin. His research interests include power electronics, distributed generation, renewable and alternative energy, and analysis of the impact of extreme events on critical power infrastructure. The latter includes performing damage assessments after several natural disasters, such as hurricanes Katrina (2005), Ike (2008) and Sandy (2012), the 2010 Maule, Chile Earthquake, the 2011 Christchurch, New Zealand Earthquake and the 2011 Tohoku, Japan, Earthquake. Dr. Kwasinski is also an active participant in Austin's smart grid initiative—Pecan Street Inc.—where he led the residential systems team. He was a member of the Executive Committee of the Argentine Electrotechnical Association during the years 1994 and 1995. In 2005, he was awarded the Joseph J. Suozzi INTELEC Fellowship and in 2007 he received the best technical paper award at INTELEC. In 2009 he received an NSF CAREER award and in 2011 an IBM Faculty Innovation Award. Dr. Kwasinski is an associate editor for the IEEE Transactions on Energy Conversion and the IEEE Transactions on Power Electronics. He has also been invited to participate in DOE workshops to develop technological roadmaps for data centers power and for microgrids, and to participate in the discussions for a world's standard on low voltage dc power distribution as part of the IEC SG4. He also participated in the discussions to produce NERC's report from the Severe Impact Resilience Task Force. Dr. Kwasinski has participated in competitive proposals review panels and was a member of the evaluation team for a DoE EPSCoR Implementation Award site visit. Dr. Kwasinski has also contributed to the organization of many conferences, including the 1<sup>st</sup> Workshop on Preparing Information and Communication Technologies Systems for an Extreme Event as its Chair, INTELEC 2010 as its treasurer, and APEC 2010 to 2014 as a track chair for the Technical Program Committee. He is also the chair of the following two technical sub-committees within the Technical Committee “Communications Energy Systems” of the IEEE Power Electronics Society: “Information and Communication Infrastructure Resistant to Extreme Events (ICIREE)” and “Information and Communication Technology Facilities Power Technologies (ICT-FPT)”. Dr. Kwasinski is also the Vice Chair of the Technical Committee of Electric Power and Telecommunications of the American Society of Civil Engineers (ASCE) Technical Council of Lifeline Earthquake Engineering.