

Curriculum Vitae

Stephen B. Bayne Ph.D.
Department of Electrical and Computer Engineering
Texas Tech University (TTU)
Lubbock, Texas,
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RESEARCH INTERESTS

Power Electronics, Power Semiconductor Devices, Grid Integration, Renewable Energy (Wind and Solar)

Recent and Current Positions

Professor, Electrical and Computer Engineering at TTU (September 2015 – Present)
Acting Associate Chair for Graduate Studies, TTU, Department of Electrical and Computer Engineering (February 2015-Present)
Associate Professor, TTU, Department of Electrical and Computer Engineering (January 09-Present)
Branch Chief, Directed Energy Branch, (DB4 – GS 15) Army Research Lab, (May 04 – January 09)
Team Leader, Power Switches Team, Army Research Lab, (September 03 – May 04)
Electronics Engineer, Army Research Lab, (July 00 – September 03)
Electronics Engineer, Naval Research Lab, (March 98 – July 00)

EDUCATION

Doctor of Philosophy, Electrical Engineering, December 1997
Dissertation Title: “Performance and Analysis of Renewable Energy Sources”
Department of Electrical Engineering
Texas Tech University
Lubbock, TX 79415

Master of Science, Electrical Engineering, December 1994
Thesis Title: “High Power Semiconductor Switching and Reliability”
Department of Electrical Engineering
Texas Tech University
Lubbock, TX 79415

Bachelor of Science, Electrical Engineering, May 1993
Department of Electrical Engineering
Texas Tech University
Lubbock, TX 79415

Associate in Applied Science, Electric Power Systems, June 1989

Community College of the AIR FORCE

Previous Experience

Adjunct Assistance Professor, Morgan State University, (Sep 02 – Jan 09)

Adjunct Assistance Professor, Howard University, (Sep 02 – Dec 02)

Research Associate, TTU, (Dec 97 – Mar 98)

Research Assistant, TTU, (Jan 93 – Dec 97)

United States Air Force (Sergeant), (Feb 86 - Feb 90)

Branch Chief, Directed Energy Branch, May 2004 – January 2009

Army Research Lab

Adelphi, MD 20783-1197

- Served as Branch Chief for the Directed Energy Branch
- Created long-range research strategies for the Branch
- Developed research goals and set guidelines for research activities
- Performed work-flow and cost benefit analysis
- Conducted complex studies in High Power Microwave Design for Army applications
- Reviewed and recommended changes in program objectives, operations and use of resources
- Managed and coordinated the High Power Microwave, HEMP and Alternative energy teams
- Established policies and procedures for Branch Personnel
- Guided the pulse power team on switching and evaluation of Si and SiC switches for pulse power applications
- Obtained funding for research from various entities
- Performed employees' annual review evaluations
- Represented the Branch at various official functions
- Managed the Branch budget and approved all purchases within the branch
- Conducted reviews of the team's performance
- Recruited, interviewed and hired new personnel within the branch
- Served as chair for the Power and Energy Strategic Technology Initiative – Led a team that developed long term planning for the power and energy research area

Team Leader, Power Switches Team, September 2003 – May 2004

Army Research Lab

Adelphi, MD 20783-1197

- Technical supervisor for four engineers and three part-time students
- Led the development of SiC models for Pspice

- Established test procedures for evaluation of SiC devices
- Liaison with the Branch Chief to develop standards for team members
- Assisted in evaluations of team members
- Managed Army programs such as SBIR and STOs
- Assisted in the development of new STOs for FCS work with TARDEC to develop the requirements for the STOs
- Managed several contracts for Power SiC devices
- Evaluated SiC devices for the DARPA wide band gap program
- Member of selection committee for DARPA's RIPE and Wide band gap program
- Evaluated SiC devices for the DARPA wide band gap program
- Evaluated SiC devices for pulse power applications

Electronic Engineer, July 2000 – September 2003

Army Research Lab

Adelphi, MD 20783-1197

- Established and built-up a Power Electronics Lab at the Army Research Lab
- Evaluated SiC Power devices for high power and high temperature power electronics applications
- Characterized Wide Band Gap devices for Power Electronic applications
- Designed Gate drive circuits to drive SiC Power Devices
- Designed systems for high temperature testing of Wide Band Gap devices
- Simulated Power Electronic systems using Pspice and Saber
- Designed, build and tested a three phase all SiC inverter circuit to drive a 3 hp motor
- Recruited and interviewed engineers for the SiC power electronic lab
- Technical Supervisor for junior engineers
- Recruited and Supervised and assigned projects to intern students

Electronic Engineer, March 1998 – July 2000

Naval Research Lab

Washington, DC 20375

- Designed Power Electronic system for space power
- Evaluated designs of Power electronic space power system
- Wrote test procedures for space application power systems
- Presented Critical design review for Spacecraft power system
- Designed circuit board layout for space application power systems
- Tested space power systems
- Electrical Lead design Engineer on projects
- Supervised and coordinated work of contractors
- Worked in a team to integrate power systems into spacecraft

Membership in Professional Societies

- [5] Senior member of IEEE
- [4] IEEE Industrial Applications Society
- [3] IEEE Nuclear and Plasma Science Society
- [2] IEEE Power Electronics Society
- [1] Passed Chair of Baltimore IEEE Power Electronics Chapter (Started the chapter)

Honors and Awards

- [12] Recognized Faculty Member, the Honors Convocation, College of Engineering 2014
- [11] IEEE Texas Tech University Student Branch Teacher of the Year 2013-2014
- [10] TTU Teaching Academy, Inducted May 2013
- [9] Recognized Faculty Member, the Honors Convocation, College of Engineering 2013
- [8] TTU Student Organization Outstanding Organization Advisor Award (National Society of Black Engineers), 2012
- [7] TTU Lockheed Martin Excellence in Engineering Teaching award, 2012
- [6] Army Greatest Invention Award, 2007
- [5] Army Research and Development Award, 2006
- [4] Army Research Lab Achievement Award for Human Resources Development, 2002
- [3] Army Research Lab Achievement Award for Engineering, 2002
- [2] Army Research and Development Award, 2002
- [1] Nominated for Black Engineer of the year by the U.S. Army, 2001

PUBLICATIONS

Submitted/Under Review (Students denoted by *)

- [1] Anitha Subburaj*, Bejoy Pushpakaran*, Dr. Stephen Bayne, “Overview of Grid Connected Renewable Energy based Battery Projects in USA” in Renewable & Sustainable Energy Review Journal

Peer-Reviewed Journal Publications (Students denoted by *)

- [37] Sandeep Nimmagadda, Atiqul Islam, Stephen B. Bayne, Javier Sanchez, Lourdes Garcia Caballero, “Improvements in the modeling of wind turbines in power system studies,” Journal of Renewable and Sustainable Energy, Vol 7, Issue 4, Aug 2015
- [36] Rajnish Kumar, Michael G Giesselmann, Stephen Bayne, Miao He, “Generalized Method For Formulation Of Optimal Pmu Placement Problem,” International Journal of Power and Energy Systems, Vol 35 Issues 1, 2015

- [35] James Schrock, William B Ray, Kevin Lawson, Argenis Bilbao, Stephen B Bayne, Shad L Holt, Lin Cheng, John W Palmour, Charles Scozzie, "High-Mobility Stable 1200-V, 150-A 4H-SiC DMOSFET Long-Term Reliability Analysis Under High Current Density Transient Conditions," IEEE Transactions on Power Electronics, Vol 30, Issue 6, June 2015
- [34] Argenis V. Bilbao, James A. Schrock, William B. Ray II, Mitchell D. Kelley, Shad L. Holt, Michael G. Giesselmann, Stephen B. Bayne, "Development and testing of an active high voltage saturation probe for characterization of ultra-high voltage silicon carbide semiconductor devices.", Review of Scientific Instruments, Vol 86 Issue 8, 2015
- [33] Xuan Pan, Guofeng Ren, Md Nadim Ferdous Hoque, Stephen Bayne, Kai Zhu, Zhaoyang Fan, Fast Supercapacitors Based on Graphene-Bridged V2O3/VOx Core-Shell Nanostructure Electrodes with a Power Density of 1 MW kg, Advanced Material Interfaces, 1 December 2014
- [32] A.S. Subburaj, B.N Pushpakaran, S.B. Bayne, "Overview of grid connected renewable energy based battery projects in USA," Renewable and Sustainable Energy Review, Vol 45, PP 219-234, 31 May 2015
- [31] Schrock, J.A.; Ray II, W.B.; Lawson, K.; Bilbao, A.; Bayne, S.B.; Holt, S.L.; Cheng, L.; Palmour, J.W.; Scozzie, C., "High-Mobility Stable 1200-V, 150-A 4H-SiC DMOSFET Long-Term Reliability Analysis Under High Current Density Transient Conditions," Power Electronics, IEEE Transactions on , vol.30, no.6, pp.2891,2895, June 2015
- [30] Sandhya Kota, Stephen B. Bayne, Sandeep Nimmagadda*, Offshore wind energy: A comparative analysis of UK, USA and India, Renewable and Sustainable Energy Reviews, Volume 41, January 2015, Pages 685-694
- [29] Anitha Subburaj*, Dr. Stephen B Bayne, Dr. Michael Giesselmann, "Analysis of Equivalent Circuit of The Battery Connected to The Grid", IEEE IAS Journal, accepted for publication in August 2014.
- [28] Sandeep Nimmagadda*, Atiqul Islam*, Stephen B. Bayne, R.P. Walker, Lourdes Garcia Caballero, Albert Fisas Camanes, "A study of recent changes in Southwest Power Pool and Electric Reliability Council of Texas and its impact on the U.S. wind industry," Renewable and Sustainable Energy Reviews, Volume 36, August 2014, Pages 350-361.
- [27] Sandeep Nimmagadda*, Mark A. Harral, and Stephen B. Bayne, "Quantitative Analysis of Wind Financial Transmission Rights using Proforma Model", International Journal of Power and Energy Systems, Vol. 34, No. 1, July 2014.

- [26] S. Bayne, S. Lacouture*, K. Lawson*, M. Giesselmann, C. Scozzie, H. O'Brien, A. Ogunniyi, "Evaluation of Experimental Si and SiC SGTO Thyristors for Wide Pulse High Action Applications," *Review of Scientific Instruments*, Vol 85, pp 075107, June 2014.
- [25] K. Lawson*, S. Bayne, S. Lacouture*, L. Cheng, H. O'Brien, A. Ogunniyi, C. Scozzie, "Safe Operating Area and Long-Term Reliability of 9 kV Silicon Carbide PNP Super Gate Turn-Off Thyristors," *IEEE Electron Device Letters*, Vol 35, PP 862-864, June 2014.
- [24] B. Pushpakaran*, M. Hinojosa*, S. Bayne, V. Veliadis, D. Urciuoli, N. El-Hinnawy, P. Borodulin, S. Gupta, C. Scozzie, "Evaluation of SiC JFET Performance During Repetitive Pulsed Switching Into an Unclamped Inductive Load," *Plasma Science, IEEE Transactions on*, vol.PP, no.99, pp.1,1, 2014.
- [23] G. Ren, X. Pan, S. Bayne, Z. Fan, "Kilohertz ultrafast electrochemical supercapacitors based on perpendicularly-oriented graphene grown inside of nickel foam," *Journal of Carbon*, 2014.
- [22] A. Islam*, S. Nimmagadda*, S. Bayne, and L. Caballero, "Power Quality Analysis of a Wind Turbine Using Optimal Iteration Process", *International Journal of Renewable Energy Research (IJRER)*, Vol 3, No. 3 (2013).
- [21] Lacouture, Shelby*, Lawson, Kevin*, Bayne, Stephen, Giesselmann, Michael, Scozzie, Charles J., O'Brien, Heather; Ogunniyi, Aderinto A., "Automated modular high energy evaluation system for experimental thyristor devices," *Review of Scientific Instruments*, vol.84, no.10, pp.105108,105108-7, Oct 2013.
- [20] B. Steiner*, S.B. Bayne, V. Veliadis, H.C. Ha, d. Urciuoli, N. El-Hinnawy, P. Borodulin and C. Scozzie, "Reliable Operation of SiC Junction-Field-Effect-Transistor Subjected to Over 2 Million 600 V Hard Switch Stressing Events", *Material Science Forum Vols. 740-742* (2013), pp 921-924.
- [19] Pushpakaran, B.N.*; Hinojosa, M*.; Bayne, S.B.; Veliadis, V.; Urciuoli, D.; El-Hinnawy, N.; Borodulin, P.; Gupta, S.; Scozzie, C., "High Temperature Unclamped Inductive Switching Mode Evaluation of SiC JFET," *Electron Device Letters, IEEE*, vol.34, no.4, pp.526,528, April 2013 doi: 10.1109/LED.2013.2247020.
- [18] V. Veliadis, B. Steiner*, K. Lawson*, S.B. Bayne, D. Urciuoli, H.C. Ha, N. El-Hinnawy, S. Gupta, P. Borodulin, R.S. Howell and C. Scozzie, "Reliable Operation of SiC JFET Subjected to over 2 Million 1200 V/114 A Hard Switched Events at 150 C", *IEEE Electron Devices Letters* Volume 34, Number 3, pp 384-386, March 2013.
- [17] S. Bayne and B. Pushpakaran*, "Silicon Carbide Technology Overview", *Journal of Electrical Engineering and Electronics Technology*, November 2012, 1:1.

- [16] K. Lawson*, G. Alvarez*, S. B. Bayne, V. Veliadis, H. C. Ha, D. Urciuoli, and C. Scozzie, "Reliable Operation of 1200-V SiC Vertical Junction-Field-Effect-Transistor Subjected to 16,000-Pulse Hard Switching Stressing," *Materials Science Forum*, 717-720, pp. 1021-1024, 2012.
- [15] M. Hinojosa*, S. Bayne, V. Veliadis, and D. Urciuoli, "Avalanche Breakdown Energy in Silicon Carbide Junction Field Effect Transistors," *Materials Science Forum*, Vols. 717-720, pp. 1025-1028, 2012.
- [14] S. Lacouture*, K. Lawson*, S. Bayne, M. Giesselmann, H. O'Brien and C. Scozzie, "Evaluation of High Power Experimental SiC SGTO Devices for Pulsed Power Applications," *Materials Science Forum*, 717-720, pp. 1183-1186, 2012.
- [13] Lawson, K*.; Alvarez, G*.; Bayne, S. B.; Veliadis, V.; Ha, H. C.; Urciuoli, D.; El-Hinnawy, N.; Borodulin, P.; Scozzie, C., "Hard-Switch Stressing of Vertical-channel implanted-Gate SiC JFETs" *IEEE Electron Device letters* Volume 33, Issue 1, pages 86-88, 28 November 2011.
- Started at TTU* [12] K. Lawson* and S. Bayne*, "Transient Performance of SiC MOSFETs as a function of 5 Temperature", *IEEE Transactions on Dielectrics and Electrical Insulation*, vol 18, issue 4, pp 1124-1129, Aug 2011.
- [11] T. E. Salem, S. B. Bayne, and D. Porschet, "An Experimental Approach for Thermal Characterization of Water-Cooled Heat Sinks Using Fourier Analysis Techniques", *Journal of Electronic Packaging* Volume 129, Issue 4, pp. 512-517, December 2007.
- [10] H. O'Brien, W. Shaheen, and S.B. Bayne, "Evaluation of 4 mm x 4 mm Silicon Carbide Thyrisors," *IEEE Trans. on Dielectrics and Electrical Insulation.*, vol. 14, no. 4, pp. 986-993, Aug. 2007.
- [9] H. O'Brien, W. Shaheen, R.L. Thomas, Jr., T. Crowley, S.B. Bayne, and C.J. Scozzie, "Evaluation of Advanced Si and SiC Switching Components for Army Pulsed Power Applications," *IEEE Trans. Magn.*, vol. 43, no. 1, pp. 259-264, Jan. 2007.
- [8] B. Geil, S. Bayne, D. Ibitayo, M. Koebke, "Thermal and Electrical Evaluation of SiC GTOs for Pulsed Power Applications," *IEEE Transactions on Plasma Science*, August 2005.
- [7] Sumi Krishnaswami, Anant K. Agarwal, Craig Capell, Jim Richmond, Sei Hyung Ryu, John W. Palmour, S. Balachandran, T. Paul Chow, Stephen Bayne, Bruce Geil, Kenneth A. Jones, Charles J. Scozzie, "1000 V, 30 A SiC Bipolar Junction Transistors and Integrated Darlington Pairs" *Materials Science Forum*, 483-485, 901, May 2005.
- [6] S. Krishnaswami, A. Agarwal, S. H. Ryu, C. Capell, J. Richmond, J. Palmour S. Balachandran, P. T. Chow, S. Bayne, B. Geil K. Jones C. Scozzie, 1000-V, 30-A 4H-SiC

BJTs With High Current Gain, IEEE Electron Device Letters :Volume: 26, Issue: 99, 2005.

- [5] Y. Gao, H. Moghbelie, M Ehsani, G. Frazier, J. Kajs, and S. Bayne, “Investigation of High-Energy and High-Power Hybrid Energy Storage Systems for Military Vehicle Application,” SAE Transactions, 2003, vol 112, pp 1843 – 1850.
- [4] S. B. Bayne, C. W. Tipton, T. Griffin, C. J. Scozzie, A. K. Agarwal, and J. Richmond, “Inductive Switching of 4H-SiC Gate Turn-Off Thyristors,” IEEE Electron Device Letters June 2002.
- [3] C. W. Tipton, S. B. Bayne, T. E. Griffin, C. J. Scozzie, B. Geil, A. K. Agarwal and J. Richmond, “Half-Bridge Inverter Using 4H-SiC Gate Turn-Off Thyristors,” April 2002 IEEE Electron Device Letters.
- [2] P. B. Shah, B. R. Geil, M. E. Ervin, T.E. Griffin, S. Bayne, K. A. Jones and T. R. Oldham, Advance Operational Techniques and pn-pn-pn structures for High-power SiC GTO thyristors. Power Electronics, IEEE Transactions on, Volume: 17 Issue: 6, Nov 2002.
- [1] Bayne, S. B., Portnoy, W. M., Hefner. MOS-Gated Thyristors (MCTs) for repetitive High Power Switching,” IEEE Transactions on Power Electronics, Transactions,” vol. 16, January 2001.

Peer-Reviewed Conference Publications (Students denoted by *)

- [73] Tyler Flack, Gail Alleyne-Bayne, William Ray, James Schrock, Stephen Bayne and Marcelo Schmidt "First year electrical engineering student development in laboratory based curriculum", 2015 FYEE, Roanoke/Blacksburg VA August 2 through August 4
- [72] Sundari Ramabhotla, Dr. Stephen Bayne, Dr. Michael Giesselmann, “Economic Dispatch Optimization of Microgrid in Islanded Mode”, in IEEE/IESC-International Energy and Sustainability Conference 2014, October 24, 2014.
- [71] K. Lawson*, J. Schrock*, W. Ray II*, S. Bayne, L. Cheng, J. Palmour, S. Allen, C. Scozzie, “Ruggedness Evaluation of 56mm², 180- A SiC DMOSFETs as a Function of Pulse Repetition Rate for High Power Applications”, International Symposium on Power Semiconductor Devices and ICs, Waikoloa, HI, June 15-19, 2014
- [70] Anitha Subburaj*, Dr. Stephen B Bayne, Dr. Michael Giesselmann, Mark A Harral , “Analysis of Equivalent Circuit of The Battery Connected to The Grid”. In IEEE/IAS 50th Industrial & Commercial Power Systems Technical Conference (I&CPS), May 23, 2014.

- [69] Sandeep Nimmagadda*, Mark A. Harral, and Stephen B. Bayne, "Challenges of Obtaining Financial Transmission Rights for Wind Projects", Proceedings of the IASTED International Conference pp 111- 118, Power and Energy (PE 2013), November , 2013
- [68] Anitha Subburaj*, Preethi Kondur, Dr. Stephen Bayne, Dr. Michael Giesselmann, Mark A Harral, "Analysis and Review of Grid Connected Battery in Wind Applications". In Sixth Annual 2014 IEEE Green Tech Conference, Corpus Christi, April 3, 2014
- [67] W. Ray*, J. Schrock*, K. Lawson*, S. Bayne, "Modular Marx Generator for DV/DT Testing of Power Semiconductor Devices," , IEEE International Power Modulator and High Voltage Conference, June 1-5, 2014, Santa Fe NM
- [66] B. Pushpakaran*, S. Bayne, A. Ogunniyi, "Thermal Analysis of 4H-SiC DMOSFET Structure under Resistive Switching," , IEEE International Power Modulator and High Voltage Conference, June 1-5, 2014, Santa Fe NM
- [65] H. O'Brien, W. Shaheen, A. Ogunniyi, C. Scozzie, L. Chen, M. Hinojosa*, K. Lawson*, S. Lacouture*, S. Bayne, " Large Chip Area SiC Diodes Demonstrated for Thyristor Protection," IEEE International Power Modulator and High Voltage Conference, June 1-5, 2014, Santa Fe NM
- [64] T. Rosson*, S. Bayne. R. Gale, "Multiple Cell AC/DC Smart Battery System", 35th International Telecommunications Energy Conference, Hamburg, Germany, 13-17 October 2013
- [63] Pushpakaran, B*. N.; Bayne, S.B.; Ogunniyi, A.A., "Electro-Thermal Transient Simulation of Silicon Carbide Power Mosfet," Pulse Power and Plasma Science (PPPS), 2013 IEEE International, June 2013, San Francisco, CA
- [62] Bilbao, A*.; Ray II, W*.; Schrock, J8.; Lawson, K*.; Bayne, S.; Cheng, L.; Agarwal, A.; Scozzie, C., "Pulsed Power Switching of 4H-SiC Vertical D-MOSFET and Device Characterization," Pulsed Power and Plasma Sciences Conference (PPPS), 2013 IEEE International, June 2013, San Francisco, CA
- [61] Lacouture, S*.; Lawson, K*.; Bayne, S.; Giesselmann, M.; O'Brien, H.; Ogunniyi, A.; Scozzie, C., "Design of an Advanced Modular Automated Evaluation System for Experimental High Power SGTOS," Pulsed Power and Plasma Sciences Conference (PPPS), 2013 IEEE International, June 2013, San Francisco, CA
- [60] L. Cheng, A. Agarwal, M. Schupbach, D. Gajewski, w. Ray. J*. Schrock, A*. Bilbao, S*. Bayne, A. Lelis, C. Scozzie, " High Performance, Large-Area, 1600V/150 A 4H-SiC DMOSFET for Robust High-Power and High Temperature Applications", ISPSD 2013, Ishikawa Ongakudo, Kanazawa, Japan, May 26-30

- [59] Patil, K8., Bayne, S., Maxwell, T., " *Modeling and Development of E85 Fueled Two-Mode Hybrid Electric Vehicle*", SAE Technical Paper, 2013-01-0547, 2013
- [58] A. Bilbao* and S. Bayne, "Pspice Modeling of Silicon Carbide MOSFTs and Device Parameter Extraction," Power Modulator and High Voltage Conference (IPMHVC), 2012 IEEE International , June 2012
- [57] Lawson, K*., Lacouture, S*., Bayne, S.B., Giesselmann, M., Vollmer, T., O'Brien, H., Scozzie, C., and Ogunniyi, A., "Design of an Automated Test Bed for Experimental Si and SiC SGTO Devices," Power Modulator and High Voltage Conference (IPMHVC), 2012 IEEE International, June 2012
- [56] B. Steiner*, S. B. Bayne, V. Veliadis, H. C. Ha, D. Urciuoli, and C. Scozzie, "Reliable Operation of SiC Junction-Field-Effect-Transistor Subjected to Over 2 Million 600-V Hard Switch Stressing Events," European Conference on SiC and Related Materials, abstract Th-11-5, Russia, 2012.
- [55] S. Pappu* and S. Bayne, "Evaluation of Hub Concept for Wind Turbines", Power and Energy Conference, Illinois, Champaign, Illinois, February. 2012.
- [54] S. Pappu*, A. Rahnama*, M. Tovar*, S. Bayne, B. Little, S. Friend and M. Borhani , "Power Quality Analysis of a Sensitive Load using a Phasor Measurement Unit", IEEE Green Technology Conference, Tulsa, Oklahoma, April 19-20, 2012.
- [53] S. Pappu*, S. Nimmagadda* and S. Bayne, "Analysis and Comparison between two wind farms consisting of 500kW midsize turbines and 1.5MW turbines", Power Electronics and Machines for Wind Applications, Denver, Colorado, July, 2012.
- [52] K. Lawson*, G. Alvarez*, S. Bayne, V. Veliadis, H. Ha, D. Urciuoli, and C. Scozzie," Reliable Operation of 1200-V SiC Vertical Junction-Field-effect-Transistor Subjected to 16,000 Pulse Hard Switching Stress", 2011 International Conference on Silicon Carbide and Related Materials, September 11-16, Cleveland, OH
- [51] M. Hinojosa*, S. Bayne, V. Veliadis and D. Urciuoli, "Avalanche Breakdown Energy in Silicon Carbide Junction Field Effect Transistors," 2011 International Conference on Silicon Carbide and Related Materials, September 11-16, Cleveland, OH
- [50] S. Lacouture*, K. Lawson*, S. Bayne, M. Giesselmann, H. O'Brien, and C. Scozzie, "Evaluation of High Power Experimental SiC SGTO Devices for Pulse Power", 2011 International Conference on Silicon Carbide and Related Materials, September 11-16, Cleveland, OH

- [49] S. Lacouture*, K. J. Lawson*, S. B. Bayne, M. Giesselmann, H. O'Brien, C. J. Scozzie, "Evaluation of Experimental Silicon SGTO Devices for Pulsed Power Applications", 18th International Pulse Power Conference, Chicago, Illinois, 19-23, June 2011
- [48] K. J. Lawson*, S. B. Bayne, "Analysis of Silicon Carbide Super Junction Transistor during Pulsed Operation", 18th International Pulse Power Conference, Chicago, Illinois, 19-23, June 2011
- [47] K. J. Lawson*, G. Alvarez*, S. B. Bayne, V. Veliadis, and D. Urciuoli, "Analysis of Silicon Carbide JFET Devices during Pulsed Operation", 18th International Pulse Power Conference, Chicago, Illinois, 19-23, June 2011
- [46] D. Reddy*, N. Beniwal* and S. Bayne, "New ASIC Architecture Development for Energy Harvesting" 33rd International Telecommunications Energy Conference, Amsterdam Netherlands, 9-13 October 2011
- [45] S. Lacouture*, K. J. Lawson*, S. B. Bayne, M. Giesselmann, H. O'Brien, and C. J. Scozzie," Unique High Energy Test Bed for Experimental Thyristors Devices", 18th International Pulse Power Conference, Chicago, Illinois, 19-23, June 2011
- [44] M. Chamana*, S.B. Bayne, "Modeling and Control of Directly Connected and Inverter Interfaced Sources in a Microgrid", 43rd North American Power Symposium, 4 – 6 August, 2011, Boston, Massachusetts
- [43] M. Chamana*, S.B. Bayne, "Modeling and Control of a Battery Management System (BMS) in a Microgrid", 33rd International Telecommunications Energy Conference, 9–13 October, 2011, Amsterdam, The Netherlands
- [42] I. Durukan, S. Ekwaro-Osire, and S.B. Bayne, "Flywheel Energy Storage Systems for Wind Turbine Grid Frequency Stability - A Review," Proceedings of the 2011 ASME International Mechanical Engineering Congress & Exposition, Denver, Colorado, Nov 11–17, 2011.
- [41] T. Schricker*, S. Bayne, M. Giesselmann, H. O'Brien and C. Scozzie, "High Action Comparison of Silicon and Silicon Carbide Super Gate Turn-off Thyristors," Thirteenth Annual Directed Energy symposium, Bethesda MD, 15-19 November 2010
- [40] K. Patil*, T. Maxwell, S. Bayne and R. Gale 2010 "Vehicle Development Process for EcoCAR: The Next Challenge Competition," IEEE Vehicle Power and Propulsion Conference (VPPC 2010), Lille, France.
- [39] K. Patil*, T. Maxwell, S. Bayne and R. Gale 2010 "Hardware-in-the-loop Testing of GM Two-Mode Hybrid Electric Vehicle" IEEE Control and Modeling for Power Electronics (COMPEL 2010), Boulder, USA

- Started at TTU* [38] K. Lawson* and S. Bayne, "Transience Analysis of SiC MOSFET Switches", IEEE Power Modulator and High Voltage Conference, Atlanta, GA, May 23-27, 2010
- [37] S. Henriquez, M. Litz, S. Bayne and D. Katsis, "Nonlinear Modeling of Ferroelectric Dielectrics Transmission Line", Pulse Power Conference 2009, Washington, D.C., June 28- July 2, 2009
- [36] R. Thomas, D. Porshet, M. Berry, and S. Bayne, "Versatile Power Modulation System for High Power Microwave Sources for High Temperature Environments", GOMAC Tech 09, Orlando, FL March 16-19 2009
- [35] A. Ogunniyi, M. Morgenstern, R. Green, H. O'Brien, S. Bayne, G. Koebke, and C. White, "Transient Evaluation of 4H-SiC DMOSFET for Power Electronics", GOMAC Tech 09, Orlando, FL March 16-19 2009
- [34] H. O'Brien, C. J. Scozzie and S. B. Bayne, "Overview of Pulse Power Research at the Army Research Lab," GOMAC Tech 08, 17-20 March 2008, Las Vegas, Nevada
- [33] T. Crowley, W. Shaheen, S. Bayne and R. Jow, "Testing of High Energy Density Capacitors," IEEE Pulse Power Conference, 17-22 June 2007, Albuquerque, NM
- [32] H. O'Brian, W. Shaheen, S.B. Bayne and A.K Agarwal, "Pulse Evaluation of High Voltage SiC Diodes", IEEE Pulse Power Conference, 17-22 June 2007, Albuquerque, NM
- [31] H. O'Brian, W. Shaheen, T. Crowley and S.B. Bayne, "Evaluation of the Safe Operating Area of a 2.0 CM², 4 KV Si SGTO" IEEE Pulse Power Conference, 17-22 June 2007, Albuquerque, NM
- [30] S. B. Bayne and M. Litz, "Power and Energy Requirements for the Army", GOMAC TECH 0719 -20 March 2007, Lake Buena Vista, FL
- [29] B. R. Geil, S. B. Bayne, H. O'Brien, "High Temperature Packaging and Pulse Testing of Parallel SiC Thyristors," 2006 SAE Power Systems Conference, 6-9 November 2006, New Orleans, LA.
- [28] Bayne, Tatum, Berry, Conrad, Tipton, Porschet, Wood, Salem, "Radio Frequency Directed Energy Against Improvised Explosive Devices (IED) RAID," 8th Annual DEPS Symposium, 14-18 Nov 2005, HI
- [27] S. Bayne, J. Tatum, A. Kehs, "US Army High Power Microwave Technology Program", ARL, HPM 2006 Conference, ARL-Adelphi, MD, April 4, 2006
- [26] H. O'Brien, W. Shaheen, T. Crowley, S. B. Bayne, "Evaluation of a 10 kV, 400 kA Si SGTO at High dI/dt," IEEE Power Modulator Conference 14-18 May 2006, Washington, D.C.

- [25] H. O'Brien, W. Shaheen, S. B. Bayne, "Evaluation of a 4 mm x 4 mm SiC GTO at Temperatures up to 150° and Varying Pulse Width," IEEE Power Modulator Conference 14-18 May 2006, Washington, D.C.
- [24] T. Crowley, H. O'Brien, W. Shaheen, S. Bayne, "Evaluation of 10 kV, 80 kA Si SGTO Switching Components for Army Pulsed Power Applications," IEEE Power Modulator Conference 14-18 May 2006, Washington, D.C.
- [23] H. O'Brien, W. Shaheen, R. L. Thomas, Jr., T. Crowley, S. B. Bayne and C. J. Scozzie, "Evaluation of Advanced Si and SiC Switching Components for Army Pulsed Power Applications," 13th Electromagnetic Launch Symposium, 22-25 May 2006, Potsdam, Brandenburg.
- [22] A. K. Agarwal, S. Krishnaswam, J. Richmond, C. Capell, S. Ryu, J. Palmour, S. Balachandran, P. Chow, S. Bayne, B. Geil, C. Scozzie, K. Jones, " Evolution of 1600 V, 20 A, SiC Bipolar Junction Transistors," The 17th International Symposium on Power Semiconductor Devices and ICs, 2005
- [21] T. E. Salem, D. Porschet, S. B. Bayne, Y. Chen, "Thermal Performance of Water-Cooled Heat Sinks," Twentieth Annual Applied Power Electronics Conference and Exposition, 6-10 March 2005, Austin Texas
- [20] T. E. Salem, S. B. Bayne, and D. Porschet, "Thermal Performance of Water-Cooled Heat Sinks: A Comparison of Two Different Designs," Semiconductor Thermal Measurement, Modeling, and Management Symposium, 2005 IEEE Twenty First Annual, March 2005
- [19] D. Katsis, B. Geil, T. Griffin, G. Koebke, S. Kaplan, G. Ovrebo, S. Bayne, "Silicon Carbide Power Semiconductor Module Development for a High Temperature 10kW AC Drive", IAS 2004
- [18] H. O'Brien, W. Shaheen and S. B. Bayne, "Pulse Power Switching of A 4 MM x 4 mm SiC Thyristor", Pulse Power conference 2005
- [17] R. L. Thomas, Jr., H. O'Brien, W. Shaheen and S. B. Bayne, "Evaluation of a 7kV 80kA SGTO Module", Pulse Power conference 2005
- [16] R. Edwards, M. Giesselmann, E. Shaffer, S. Bayne and S. Kaplan, "Forward and Reverse Recovery Spice Model of a JBS Silicon Carbide Diode," 26th Power Modulator Symposium and 2004 High Voltage Workshop, 23-26 May 2004, San Francisco, CA
- [15] Agarwa, A.K., Sei-Hyung Ryu, Richmond, J., Capell, C., Palmour, J.W., Balachandran, S., Chow, T.P., Geif, B., Bayne, S., Scozzie, C., and Jones, K.A., "Recent progress in SiC bipolar junction transistors Power Semiconductor Devices and ICs," 2004. Proceedings ISPSD '04. The 16th International Symposium, 24-27 May 2004

- [14] R. Thomas, M. Morgenstern and S. Bayne, "Silvaco Modeling of 10 KV SiC P-I-N Diodes," 26th Power Modulator Symposium and 2004 High Voltage Workshop, 23-26 May 2004, San Francisco, CA
- [13] B. Geil, S. Bayne, and D. Ibitayo, "Thermal Evaluation of SiC GTOs for Pulse Power Applications," 26th Power Modulator Symposium and 2004 High Voltage Workshop, 23-26 May 2004, San Francisco, CA
- [12] J. D. Thomas, S. Kaplan, and S. B. Bayne, "Evaluation of 4H-SiC BJTS," 26th Power Modulator Symposium and 2004 High Voltage Workshop, 23-26 May 2004, San Francisco, CA
- [11] S. Bayne and D. Ibitayo, "Evaluation Of SiC GTOs for Pulse Power Switching," 14th IEEE International Pulsed Power Conference, June 2003, Dallas, TX.
- [10] S. Kaplan, T. Griffin, and S. Bayne, "Silicon vs. Silicon Device Characterization," 14th IEEE International Pulsed Power Conference, June 2003, Dallas, TX.
- [9] C. W. Tipton, S. B. Bayne, T. E. Griffin, C. J. Scozzie, and B. Geil, "High-Temperature, 400 W, DC-to-AC Inverter Using Silicon Carbide Gate Turn-Off Thyristor and P-I-N diodes", ARL Technical Report October 2003.
- [8] A. Agarwal, S. Ryu, J. Richmond, S. Balachandran, T. Chow, Y. Tang, S. Bayne, K. Jones, C. Scozzie, P. Shaw, and W. Tipton, "Design and Performance of 600V, 15A JBS Rectifiers and Switches," CTA Conference, Army research Lab 29 April – 01 May 2003, College Park MD.
- [7] S. Bayne, C. W. Tipton, C.J Scozzie and T. E. Griffin, "High-Temperature Switching and Evaluation of 4H-SiC Gate Turn-off Thyristors and Diodes under Inductive Loads," IECEC, 2002, Washington DC
- [6] S. B. Bayne, C. W. Tipton, C. J. Scozzie, T. Griffin, A. K. Agarwal, and J. Richmond, "High Temperature Inductive Switching of SiC GTO and Diode," Power Modulator Conference and High Voltage Workshop June 30 – July 3 2002, Hollywood California
- [5] P. B. Shah, B. R. Geil, M. E. Ervin, T.E. Griffin, S. Bayne, K. A. Jones and T. R. Oldham, Advance Operational Techniques and pn-pn-pn structures for High-power SiC GTO thyristors. 2001 Applied Power Electronic Conference
- [4] Bayne, S. B., Portnoy, W. M., and Rohwein, G. J. "The Use of Thyristors for Repetitive Narrow Pulse, High Power Switching," International Power Modulator Symposium, 26 June – 29 June, 2000. Norfolk VA.
- [3] S.B. Bayne and M. G. Giesselmann, Effect of Blade Passing on a Wind Turbine Output, 35Th Intersociety Energy Conversion Engineering Conference and Exhibit, 24 July – 28 July 2000. Las Vegas, Nevada.

[2] Bayne, S. B., “Wind Farm Analysis for Power Grid Connection,” Joint Fall Meeting of the Texas Section of APS and AAPT and SPS Zone 13, October 26-28, 1995. Lubbock TX.

[1] Bayne, S. B., Portnoy, W. M., Rohwein, G. J., and Hudgins, J. L. “Mos-Gated Thyristor (MCT) for High Power Switching,” Twenty-first International Power Modulator Symposium, June 27-30, 1994, Costa Mesa, California

Citations from Google Scholar: 373

Short Course

[2] S. Bayne, “Overview of Power Semiconductor Devices,” 2014 IEEE International Power Modulator and High Voltage Conference, June 2014, Santa Fe, NM

[1] S. Bayne, “Solid State Switching,” TTU Pulsed Power Short Course, January, 2010, Lubbock, TX

Invited Presentations

[4] S. Bayne, “Overview of Silicon Carbide Power Devices,” 6th Annual IEEE Green Technologies Conference, Corpus Christi, TX, April 3-4 2014

[3] S. Bayne, “Transient Switching Analysis of Silicon Carbide Devices” University of Texas Arlington, 21 February, 2014

[2] S. Bayne, “Pulsed Evaluation of SiC Power Devices” University of Missouri National Security Seminar Series, 15 April 2013

[1] S. Bayne, “Pulsed Evaluation of SiC Power Devices”, University of Nebraska-Lincoln, April 8th 2013

Book Chapter

[1] “Silicon Carbide Technology and Power Electronics Applications,” Advances in Silicon Carbide Processing and Applications, C. Wesley Tipton IV and Stephen B. Bayne, 2004

GRANTS

Table 1: Funding Received

Date	Agency	Title of Proposal	Total	Credited
02/2015-02/2016	Army Research Lab	Semiconductor Evaluation for High Action Applications	\$400,000	\$320,000

Date	Agency	Title of Proposal	Total	Credited
01/2015-01/2020	TX Emerging Technology Fund	Supporting the Global Laboratory for Energy Asset Management & Microgrid (GLEAMM)	\$2,415,000	\$265,650
*07/2014-06/2014	Office of Naval Research	Thermal Imaging of High Power Semiconductor Switches for Defense Applications	\$124,495.00	\$124,495.00
*09/2014-09/2015	Army Research Lab	Semiconductor Evaluation for High Action Applications	\$300,000.00	\$240,000.00
*08/2012-12/2014	CCET	Technology Solution for Wind Integration	\$300,000.00	\$150,472.00
*07/2014-02/2015	CREE/ARL	Evaluation of High Voltage SiC IGBTs	\$100,000.00	\$100,000.00
*03/2010-08/2011	AFOSR/HEM	Advanced Nonlinear Transmission Lines as High Power Microwave Sources	\$48,000.00	\$48,000.00
11/2012-04/2014	Athena Energy Corp	Diamond Schottky Barrier Based Alpha Voltaic Energy Sources	\$50,000.00	\$25,000.00
*12/2012-09/2014	U.S. Army Research Lab/CREE	Evaluation of High Voltage SiC IGBTs	\$150,000.00	\$150,000.00
*02/2012-12/2012	U.S. Army Research Office/AAS	Research and Engineering Apprenticeship Program	\$10,400.00	\$10,400.00
*03/2010-03/2012	US Army Research Office	Semiconductor Evaluation for EM Gun Applications	\$950,408.00	\$475,204.00

Date	Agency	Title of Proposal	Total	Credited
*11/2010-05/2012	ARO/CREE	Silicon-carbide Power Devices Characterization	\$24,000.00	\$24,664
*09/2010-02/2011	Air Force Office of Scientific Research	Support for 4th US-Japan Pulsed Power and Symposium on Pulsed Power and Plasma Applications	\$19,908.00	\$19,908.00
*04/2014-12/2015	DOD/ Academy of Applied Science	The REAP Program	\$5,500.00	\$5,500.00
*01/2013-02/2014	Alstom Power	Grid Integration Phase 2	\$136,089.00	\$136,089.00
*03/2014-03/2015	Alstom Power	Grid Integration Phase 3	\$118,370.00	\$118,370.00
*06/2013-06/2015	DOE	Collaborative Industry-Academic Synchrophasor Engineering Program	\$199,950.00	\$67,983.00
*01/2012-01/2013	Alstom Power	Grid Integration	\$136,762.00	\$68,381.00
*01/2011-02/2012	Alstom Power	Market Watch	\$81,508.00	\$27,713.00
*03/2014-08/2014	Google Inc.	Evaluation of SiC Modules	\$51,574.00	\$51,574.00
09/2009-08/2010	DOE	Great Plains Wind Power Test Facility	\$1,902,950.00	\$38,059.00
10/2010-09/2013	NSF	MRI-Development of Real Time Simulator for Smart Grid Systems Integrated with Distributed Renewable Energy Sources	\$415,000.00	\$41,500.00

Date	Agency	Title of Proposal	Total	Credited
10/2010-09/2011	DOE	Midsize Wind Turbine Designed and Manufactured in the USA	\$849,995.00	\$169,999.00
*07/2010-07/2015	NIRE	Prototype Testing R&D Project	\$3,918,863.00	\$3,918,863.00
09/2010-09/2013	DOE	Great Plains Wind Power Test Facility	\$2,000,000.00	\$120,000.00
06/2011-05/2015	NSF	Scholarships in Semiconductor Device Engineering	\$599,970.00	\$59,997.00
Grand Total			\$15,308,742.00	\$6,777,821

Dr. Bayne is the Lead PI *

Scholarship

[1] S. Bayne Apex Energy, Energy Scholarship, \$5,000. Year 2012

[2] PMU, Group NIRE, \$1,500. Year 2015

TEACHING EFFECTIVENESS

Graduate Education

Graduate Faculty Membership

- [2] Morgan State University
- [1] Texas Tech University

Doctoral Students Supervised

- [2] PhD, (Technical Chair) Morgan State University, Aderinto Ogunniyi, "Evaluation and Reliability Analysis of SiC Bipolar Devices under Pulsed Conditions", 19 Oct 2011
- [1] PhD, (Technical Chair) Morgan State University, Ron Green, "SiC DMOSFET Characterization and Evaluation for Power Electronics Applications", 2010

Doctoral Students Graduated

- [6] Sundari Ramabhotla, "Energy Management in Microgrids," Aug 2015
- [5] Atiqul Islam, "Wind Power Stability Enhancement by Providing Optimized Power Quality Analysis, Short Circuit Ratio Estimation and Energy Storage Based Frequency Response, May 2015.
- [4] A. Subburaj, "Modeling and Analysis of Battery and Renewable Connected to the Grid, Aug 2011 –December 2014
- [3] M. Hinojosa, "Modeling and Evaluation of High Power, High Voltage 4H-SiC IGBTs," 2009 – August 2014
- [2] K. Lawson, "SOA Development and Long Term Reliability Testing of SiC SGTOs, Fall 2009 – August 2014
- [1] S. Nimmagadda, "Advanced Solutions to Grid Interconnection Issues Due to Large Scale Grid Integration of Wind Energy," January 2010 – August 2014

Doctoral Committees Currently Chairing

- [4] S. Lacouture, "Long-Term Reliability Analysis of Silicon Carbide Switching Elements for Pulsed Power Application," May 2010 - present, (Scheduled to Graduate in May 2015)
- [3] B. Pushpakaran, "Thermal Analysis of Silicon Carbide Power Devices During Avalanche Breakdown," August 2011 – present (Scheduled to Graduate in May 2015)

[2] T. Flack, “Development of a Smart Solid State Transformer for Utility Applications,”
Spring 2013 – present (Scheduled to graduate in fall 2018)

[1] N. Shamin, “Development of a ASIC Energy Harvesting System”, Spring 2014 – present
(Scheduled to graduate in fall 2019)

Doctoral Committees Currently Co-Chairing

[2] R. Kumar, “State Estimation of Power Systems”, 2009 – present (Scheduled to Graduate in
December 2014)

[1] A. Bilbao, “Analyze and Establishment of the Safe Operating Area of 24 kV SiC n-IGBT,”
fall 2010 – present (Scheduled to Graduate in December 2015)

Doctoral Committees Member

[10] EE, Weibo Hu, “Low-Voltage Multi-Level Pulsed Width Modulation Power Inverters”,
2014

[9] EE, Ganapathy Sivakumar, “MEMS - Design, Testing and Characterization”, 2010

[8] EE, Dallas Webster, “Built-in Self-Test Methodology for Replacing Conventional Radio
Frequency Tests in a Wireless Local Area Network System”, 2010

[7] EE, Ryand Karhi, “A Multi-Stage Distributed Energy Plasma Arc Railgun”, September
2010

[6] EE, Jerry Lopez, “Silicon-Based Monolithic RF Power Amplifiers and Coupled Voltage-
Controlled-Oscillators Arrays for Modern Commercial and Military Applications”, 27 May
2011

[5] EE, Travis Vollmer, “Evolution of Current Mode Control Approaches for Implementation
in Rapid Capacitor Charger Technology”, 29 June 2012 Committee member

[4] EE, Yan Li, “Highly Efficient and Linear SiGe BiCMOS Power Amplifiers Using
Envelope-Tracking for Mobile Broadband Wireless Communications”, 14 June 2012.

[3] EE, Li Lu, “Low supply Voltage Temper Sensors for On-Chip Thermal Management”, 21
march 2013

[2] ME, Kunal Patil, “Mathematical Modeling, HIL Testing and In-Vehicle Validation of E85
Fueled Two-Mode Hybrid Electric Vehicle”, 26 March 2013, Committee member

[1] ME, Fisseha M. Alemayehu, “Probabilistic Multibody Dynamic Analysis of Gear systems
for Wind Turbines”, 31 May 2013

Master's Students Graduated

- [17] MSEE Tyler Flack, "Characterization of an n-type 4 kV GTO for power applications," 15 May 2015
- [16] MSEE James Schrock, "Development of Pulse Power Systems for the Evaluation of Advanced High Power Silicon Carbide Devices," 15 May 2015
- [15] MSEE, Brina Saldivar, "Analysis and Control of a Mixing System for Well Stimulation," March 2014
- [14] MSEE, Manisha Potay, "Design of RF Energy Harvesting System and Testing of the Piezoelectric Energy Harvesting System Chip," March 2014
- [13] MSEE Thomas Rosson, "Multiple Cell AC/DC Smart Battery Design", May 2013
- [12] MSEE Santosh Pappu, "Design and Analysis of Wind Energy Systems in Power Applications", 26 June 2012 Chair
- [11] MSEE Purvi Patni, "Integrated Power Systems", Dec 2012
- [10] MSEE, Toluwalope Owodunni, "Design and Analysis of an ASIC for Energy Harvesting Applications", Dec 2012
- [9] MSEE Brian Steiner, "Pulsed Evaluation of Silicon Carbide Power Switches", May 2012
- [8] MSEE Bejoy Puspakaran, "Transient Analysis of Silicon Carbide Power MOSFETs", May 2012
- [7] MSEE Rupinder Kaur Pannu, "Characterization of Fuel Gauge for Portable Applications", 9 March 2011
- [6] MSEE Kevin Lawson, "Pulsed Evaluation of Silicon Carbide Majority Carrier Devices", 13 June 2011
- [5] MSEE Manohar Chamana, "Modeling and Control of Directly Connected and Inverter Interfaced Sources in a Microgrid", 23 June 2011
- [4] MSEE Divya Reddy, "New Architecture Design for Energy Harvesting", 16 June 2011
- [3] MSEE Andrew Vaselaar "Experimentation and Modeling of Pulse Sharpening and Gyromagnetic Precession within a Nonlinear Transmission Line", 13 June 2011
- [2] MSEE Sidhanthi, Swathi, "Advanced Design and Simulation of Hybrid Electric Vehicle" (December 2010).

[1] MSEE Schricker, Travis, "Modeling and Simulation of Si and SiC GTO under Pulsed Conditions" (December 2010).

Master's Committees Served or Serving On

[27] MS EE Joanna Gatlin, "Industry Semiconductor Test Solutions for Academic Laboratory Programs," Feb 2015

[26] MSEE, Nadine Estermann, "Via Reliability and Process Marginality Device," 16 October 2014

[25] MSEE, Juan Rodriguez, "Gamma Radiation Detection Testing," 26 March 2014, Committee member

[24] MSEE Longfei Wang, "Design of Integrated Voltage-Mode controlled DC-DC Buck Converter", 27 March 2013, Committee member

[23] MSEE, Alan Aragon, "ATE to Automated Bench Test Correlation", 19 March 2013,

[22] MSEE Babar Aziz Chaudhary, Date 3 March 2009 Topic: Managing Arc Flash hazard in Power Distribution Systems

[21] MSEE Travis Vollmer, 25 June 09, "Advancements in Design of A compact Rapid Capacitor Charger

[20] MSME Allan Falls, 25 June 09, Design and Validation of an Alternative Fuel Two Mode Hybrid

[19] MSEE Xiaojing Ren 22 October 2009 MSEE, Reliability Qualification of Quad Flat No-lead Package Devices

[18] MSEE, Prakash Arujun Design of a controllable electronic load circuit enabling multisite testing for buck power converters, MSEE 12 March 2010

[17] MSME Carl Robert Gabriel, Two-Mode Hybrid CAN Development and Implementation into Vehicle with Digital Display. March 25, 2010

[16] MSEE Vasantkumar Trambadiya, Parametric Measurement of Highly Integrated Power Management Circuit, May 2010

[15] MSEE Ashwin Vijayasia, Haptic controlled A-Y-Z MEMS gripper System, 30 June 2010

[14] MSEE Surya Kolluru, MEMS Atomic Force Microscope (AFM) 2010

[13] MSEE Sharanya Kasinathan Test development of Fully Integrated Buck Converter 30 June 2010

- [12] MSEE Shruti Eravelli, "Analog Monitoring and Control Characterization" 2/15/2011
- [11] MSEE Jillesha Thawani, "Removal of Kelvin Contactor with Soft Compensation", 23 June 2011
- [10] MSEE Shachi Paithanka, "Direct Attached cable Assembly specification Analysis from 8 port s- Parameter 24 June 2011
- [9] MSEE David Reale, "Performance of a Mobile solid State GPS Linked Pulsed Ring down Array", 29 June 11
- [8] MSEE, Muruganandhan Subramaniam, "Circuit Sensitivity of a Processor", 5 October 2011
- [7] MSEE, Spandana Kocherlakota, "Understanding the Design of Output Filters of Internally Compensated Power Converters and The Effect of a Feed forward capacitor", 19 October 2011
- [6] MSEE, Swamynathan Ganesh, "Design and Implementation of Cost Effective Solution for Testing of Light Emitting Diode Driver" 20 Oct 2011
- [5] MSEE Committee member, Shreyas Rao, "Developing an Optimal General Purpose Interface Board for an Automated Test Equipment", 29 Feb 2012
- [4] MSEE Committee member, Nivetha Shivan, "Qualification of The Assembly Process of Flip-Chip BGA Packages for the Next Generation Synchronous Quad Data Rate SRAM Devices to Ensure Reliability," March 2012
- [3] MSEE Committee member, Seyed-Mahdi Ghamkhari, "Management and Profit Maximization of Green Data Centers", May 4, 2012
- [2] MSEE Committee member, Md Ashfaqur-Rahman, "False Data Injection Attacks with Incomplete Information", May 7, 2012
- [1] MSEE, Leslie Arroyo, "Development and Validation of a Laboratory Automation Solution for Bench Characterization" 28 July 2012 Committee member

Graduate Dean Representative at Doctoral Dissertation Defenses

- [3]Ph.D. Wind Science and Engineering, Neha Marathe, "Investigation of Power Performance and Wakes of Wind Turbines Under Yawed Flow," 22 August 2014
- [2]PhD Industrial Engineering Ernee Kozyreff Filho, "Valid Inequalities and Computational Results for SOS1-, SOS2-, and Cardinality Constrained Linear Programs", 5 May 2014,
- [1] Bradley Nemanich, "Design a Sequence Compiler for Multi-Core Processors", 2009

Courses Taught (Graduate)

- [4] ECE 5316 Power Electronics (Spring 2009, Spring 2010, Spring 2011, Spring 2012, Fall 2013)
- [3] ECE 5354 Power Semiconductor Devices (Fall 2009 Special Topics, Spring 2011, Spring 2013)
- [2] ECE 5320 DC-DC Converter Design and Test (Spring 2010 Special Topics, Fall 2010, Fall 2011, Fall 2012, Spring 2014)
- [1] ECE 5332 012 Design, Simulate and Testing of Electronics Systems (Spring 2011)

New Course Developed and Introduced into Curriculum

- [2] ECE 5354 Power Semiconductor Devices
- [1] ECE 5320 DC-DC Converter Design and Test

Distance Education

- [2] ECE 5316 Power Electronics
- [1] ECE 5354 Power Semiconductor Devices

Courses Taught (Undergraduate)

- [6] ECE 4316 Power Electronics (Spring 2009, Spring 2010, Spring 2011, Spring 2012, Fall 2013)
- [5] ECE 4354 Power Semiconductor Devices (Fall 2009 Special Topics, Spring 2011, Spring 2013)
- [4] ECE 2372 Modern Digital Design (Fall 2011, Fall 2012)
- [3] ECE 3332 Project Laboratory II (Spring 2012, Fall 2013)
- [2] ECE3334 Computer Engineering Project Laboratory II (Spring 2012, Fall 2013)
- [1] IS 1100 Raider Ready: Freshman Seminar (Fall 2012)

Distance Education

- [2] ECE 4316 Power Electronics
- [1] ECE 4354 Power Semiconductor Devices

PROFESSIONAL SERVICE ACTIVITIES

Service to Department of Electrical Engineering

- [9] Served on the committee for two open positions in Pulsed Power, 2014
- [8] Faculty advisor for the Texas Energy Innovation Challenge Competition, The TTU team placed second and was awarded a scholarship of \$7,000.00, 2013
- [7] Served as the Chair of the Search committee for the Junior Faculty in Power and Energy, 2013
- [6] Served on the ECE Communication and Controls Subcommittee 2010
- [5] Presentation to the IBA, "Renewable/Sustainable Energy," 9 October 2009
- [4] Chair ABET Subcommittee on Electronics, 2009
- [3] Arrange and Invited a Division Chief and a Branch Chief from Advanced Energy Armaments Division to visit Pulsed Power and the ECE department. The trip led to funding for the Pulsed Power Lab, 2009
- [2] Faculty advisor for the EcoCar project, 2009
- [1] Presentation to the ECE Graduate seminar, "Alternative Energy Research," 2009

Service to the College of Engineering

- [7] Faculty Advisor for the National Society of Black Engineers 2010 – Present
- [6] Served on the Student Grade Appeal Panel, 2013
- [5] Served on the Student Grade Appeal Panel, 2011
- [4] Served on the search committee to hire a new Associate Dean for Research, 2011
- [3] Presentation to the College of Engineering Houston Alumni, Meeting, "Advanced Energy Research," 2011
- [2] Conducted peer review on two faculty members in Engineering
- [1] Mentor international student from Brazil

Service to the University

- [6] Served on the Faculty Senate, 2010-Present
- [5] Mentor for Undergraduate Research, Faculty Mentor 2010
- [4] Served as a reviewer for the Graduate School Scholarship program, 2013

- [3] Served on the Faculty Senate subcommittee for Digital Measures
- [2] June 2013: Reviewer for the 2013 Summer Faculty nomination recruitment fellowship for graduate students at TTU
- [1] Council for TTU Presidential Search Committee, Committee Member

Service to the Profession of Engineering

Editorial Boards

- [1] Editor for Journal of Electrical and Electronics Engineering 2013 – Present

External Evaluator for Tenure

- [1] University of Michigan – Dearborn

Journal Reviews

- [10] IEEE Transactions on Plasma Science, Reviewer, Journal Article, 2013
- [9] IEEE Transactions on Plasma Science, Reviewer, Journal Article, 2012
- [8] Reviewer: IEEE Electron Devices Letters, July 2012
- [7] Reviewer for Journal on Energies special issue: 25 April 2012
- [6] Reviewer for IEEE Transactions on Electron Devices, Junction Transistors. April 2012
- [5] IEEE Transactions on Plasma Science, Reviewer, Journal Article, 2011
- [4] IEEE Transactions on Dielectrics and Electrical Insulator, Reviewer, 2010
- [3] IEEE Transactions on Plasma Science, Reviewer, Journal Article, 2010.
- [2] Reviewer for the Journal on “Solid-State Electronics”, 2004
- [1] Reviewer for IEEE Transactions on Plasma Science, 2004

Conference Paper Reviews

- [14] Review IEEE International Power Modulator and High Voltage Conference, 2012
- [13] Review, ECCE conference, 2010
- [12] Reviewer for the IEEE Green Tech Conference 2009
- [11] Review committee for the APEC conference, 2006

- [10] Review committee for the PESC conference, 2006
- [9] Reviewed for the IECEC conference, 2006
- [8] Session chair for SiC devices applications at the APEC Conference, 2006
- [7] Review committee for the Applied Power Electronic Conference (APEC), 2005
- [6] Review Committee for Power Electronic Specialists Conference, 2002
- [5] Review Committee for Applied Power Electronic Conference, 2002
- [4] Review Committee for Applied Power Electronic Conference, 2001
- [3] Review Committee for Applied Power Electronic Conference, 2000
- [2] Review Committee for Power Electronic Specialists, 2000
- [1] Review Committee for Power Electronic Specialists, 1999

Grant Review Panels

- [13] Served on the NSF Graduate Research Fellowship panel as a reviewer for Electrical and Computer Engineering, January 2014
- [12] DOE Review for 11 proposals. Topic” Vehicle Technologies Programs Wide Funding Opportunity, 2011
- [11] Reviewer for the Department of Energy Office of Science Phase 1 SBIR in the area of Thyatron Replacement
- [10] Served on the NSF Machines and Power Electronics Panel as a reviewer, April 2014
- [9] Review proposal for DOE SBIR program. “Topic Laser Pumped Silicon Thyristor Switch”, 2011
- [8] Review SBIR for DOE titled Fast 20 kV Modulator Switch, 2010
- [7] Review DOE Phase II SBIR: SiC Switches, 2010
- [6] Reviewer: DOE Hydrogen Program & Vehicle Technologies 2010 Annual Merit Review & Peer Evaluation, 2010
- [5] Served on a Panel Review for the Army High Power Laser Program, 2009
- [4] Reviewer Served on the Evaluation panel for the DOD Science Mathematics and Research Transformation (SMART) Program, 2012
- [3] Army Research Office Reviewer for the 2004 Power Modulator Symposium and High Voltage Workshop, 2004

[2] Member of the Technical Review Panel for the OSD SBIR, 2003

[1] Member of the Technical Review Panel for the DARPA Wide, 2001

Conferences

[11] Session organizer for the Pulse power conference June 2013: Topic Compact Pulsed Power

[10] Session Chair Pulse Power Conference June 2013: Opening Switches

[9] Organizer for the 2012 39th IEEE International Conference on Plasma Science, Generator session 8-12 July 2012

[8] Technical Program Committee for the 2012 IEEE International Power Modulator and High Voltage Conference, San Diego, CA, June 3-7, 2012

[7] Session organizer for 38th International conference of Plasma Science, Organize the switches session, 2011

[6] Session chair for 18th IEEE International Pulse Power Conference, Session Microwaves II: Microwaves and RF sources, Antennae and systems, 2011

[5] Session Chair Packing and Modules of SiC Devices, 2011 International Conference on Silicon Carbide and Related Materials, September 11-16, Cleveland, OH

[4] Chair for Solar, Wind and other Alternatives session at the IEEE Green Tech Conference, April 2009

[3] Section organizer for the Semiconductor devices session of the Pulse Power Conference, 2003

[2] Review Committee for Power Electronic Specialists, 2001

[1] Chairman for the Magnetic Component section of the Power, Electronic Specialists Conference, 1999

Conference Organization

[1] General Chair for the Fourth Japan/US Symposium on Pulsed Power and Plasma Applications, Oahu, HI, 2010

Outreach and Diversity

[9] Brought the National GEM Program to Texas Tech, 2012 – Present

[8] Brought the Research and Engineering Apprenticeship Program (REAP) to Texas Tech, 2012 – Present

- [7] Director for the REAP program, 2012 – present
- [6] Judge for the Junior Science and Humanities Symposium, sponsored by the Air force, Navy and Army
- [5] Served on the IEEE Admission and Advancement Committee Senior member review panel, 2007
- [4] Served as a mentor in the Science and Technology Program senior project at Oxon Hill High School, 2006
- [3] Served as the closing ceremony speaker at ARL Gains in the Education of Mathematics and Science (GEMS) program, 2006
- [2] Science fair judge for the Science fair INTEC IS EF 2004-2008
- [1] Program evaluator for the ABET to evaluate and accredit Engineering and Engineering Technology Programs 2005 -2010

Other Service

- [11] Chair for the IEEE Region 5 Audit Committee, 2014
- [10] Participate in the TI University Program Curriculum Open Forum Dallas Texas, 4th March 2014
- [9] Served on the Panel, “Technologies for Wind Integration in ERCOT” 6th Annual IEEE Green Technologies Conference, Corpus Christi, TX, April 3-4 2014
- [8] Served as a judge for the National GEM Consortium 2013 Technical Presentation Competition
- [7] Served on the University of Missouri Columbia Electric Magnetic Launch Advisory board 2011-2013
- [6] Presentation to IAB on Renewable/Sustainable Energy
- [5] IEEE NPSS Pulsed Power Science and Technology Committee (2010 - Present).
- [4] Served on the IEEE Region 5 Audit Committee 2011 - 2014
- [3] Served on the Heartland Alliance for Regional Transmission committee, 2013
- [2] Serve as Vice Chair of the IEEE South plains section 2011-2012
- [1] Founding president of the Baltimore Section IEEE Power Electronics society, 200

PRESENTATIONS

- [11] Presentation to Estacado High School Junior SHPE, 27 February 2013, “Transition from High School to College and the GEM Program”
- [10] Bayne, S., ARL, Adelphi MD, “Reliability analysis of SiC Devices,” January 2013
- [9] Presentation, “Multiple Cell AC/DC Smart Battery Design”, 13-17 October 2013, Hamburg, Germany
- [8] Presentation, “Pulsed Evaluation of SiC Power Devices”, Air Force –TTU Directed Energy Collaborative Workshop, 24 June 2013 Albuquerque, New Mexico
- [7] Presentation, “Pulsed Evaluation of SiC Power Devices”, University of Nebraska-Lincoln, April 8th 2013
- [6] Presentation, “Pulsed Evaluation of SiC Power Device”, Computer Science Department, Texas Tech University, 23 April 2013
- [5] Presentation to Sandia Lab personnel, Micro-Grid Research, 3 July 2012
- [4] Presentation: “Wind Energy and Micro Grid Research”, Wind Farm Underperformance and Partnership NWRC, Texas Tech University, March 28-30 2012
- [3] Presentation, “GEM Program” to the National Society of Hispanics Engineers at Texas Tech University, 2012
- [2] Presentation, WCoE Houston Alumni Meeting 18 November 2011, “Advanced Energy Research”
- [1] Presentation, “Modeling and Control of a Battery Management System (BMS) in a Microgrid”, 33rd International Telecommunications Energy Conference, 9–13 October, 2011, Amsterdam, The Netherlands