

Behrooz Mirafzal

MCEC Distinguished Professor
Department of Electrical Engineering
University of South Carolina, Columbia, SC 29208

Cell Phone: (954) 809-8475
Email: mirafzal@sc.edu
Web: <https://www.specsteam.com/>

Appointments:

MCEC Distinguished Professor, Department of Electrical Engineering, University of South Carolina	Columbia, SC 2025 - Present
Professor, Department of Electrical and Computer Engineering, Louie T. Marshall Engineering Professor ECE Graduate Program Director, Kansas State University	Manhattan, KS 2021 - 2025
Associate Professor, Department of Electrical and Computer Engineering, Kansas State University	Manhattan, KS 2015 - 2021
Assistant Professor, Department of Electrical and Computer Engineering, Kansas State University	Manhattan, KS 2011 - 2015
Assistant Professor, Department of Electrical and Computer Engineering, Florida International University	Miami, FL 2008 - 2011
Project Engineer, Research and Development Group of Standard Drives Division, Rockwell Automation	Mequon, WI 2005 - 2008
Adjunct Assistant Professor, Department of Electrical and Computer Engineering, Marquette University	Milwaukee, WI 2005 - 2008

Education:

Marquette University Ph.D. in Electrical Engineering	Milwaukee, WI, USA 2005
Isfahan University of Technology B.Sc. in Electrical Engineering	Isfahan, Iran 1994

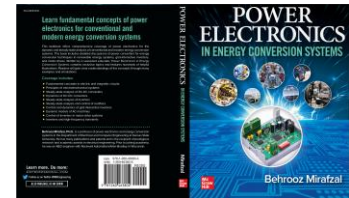
Honors and Recognitions:

- Louie T. Marshall Engineering Professorship, KSU, 2022-present
- Steve and Donna McKinnis Award, KSU, 2024
- IEEE IAS, Renewable Energy Committee, Second Best Prize Transactions Award, 2024
- Myers-Alford Memorial Teaching Award, KSU, 2023
- Larry E. and Laurel Erickson Public Service Award, KSU, 2022
- George Yeh Keystone Research Scholar, KSU, 2021-2025
- Michelle Munson-Serban Simu Keystone Research Scholar, KSU, 2017-2022
- Dean's Award of Excellence in Service, KSU, 2021
- IEEE IAS, Renewable Energy Committee, Third Best Prize Transactions Award, 2020
- Listed in the top 2% of researchers in the world (Field: Electrical and Electronics Eng.), according to 2020-23 studies done by Stanford University
- The 2019 Frankenhoff Outstanding Research Award, KSU, 2019

- Dean's Award of Excellence in Research, KSU, 2017
- NSF CAREER Award Recipient, 2014
- NSF EPSCOR First Award, 2012
- IEEE Power and Energy Society, Best Prize Transactions Award, 2012
- IEEE Industry Application Society, Second Best Prize Transactions Award, 2008
- Innovation Award, Rockwell Automation, December 2006
- IEEE Senior Member, December 2007
- IEEE IAS Associate Editor, Certificate of Recognition, 2013

Book: "Power Electronics in Energy Conversion Systems," by Behrooz Mirafzal, Publisher: **McGraw-Hill**, 450 pages, 2021.
ISBN: 9781260463804

This textbook features theoretical and practical coverage of the power electronics and electric machines required for the dynamic and steady-state analysis of modern energy conversion systems.



US Patents:

- B. Mirafzal, Jianbiao He, and Fariba Fateh, "Smart Coils for An Electric Motor," International Application Under the Patent Cooperation Treaty, August 2023, **US Patent Application 63/267,641**, Feb. 2022.
- B. Mirafzal, "Direct-Drive Wind Turbine Circuit Topology with Single-Stage Boost Inverters," **US Patent No. 10,707,791**, July 2020.
- B. Mirafzal, and C. R. Winterhalter, "Integrated DC Link Inductor and Current Sensor Winding," **US Patent No. 8,373,952**, February 12, 2013.
- B. Mirafzal, "Technique for High-Impedance Ground Fault Detection at the Common DC Bus of Multi-Axis Drives," **US Patent No. 7,751,993**, July 6, 2010.
- B. Mirafzal and N. A.O. Demerdash, "Method of Diagnosing a Broken Bar Fault in an Induction Motor," **US Patent No. 7,081,760**, 25th July 2006.

Journal Publications [^(*) denotes graduate student]:

53. M. Sadoughi ^(*), F. Fateh, J. He and B. Mirafzal, "An Adaptive Method for Mitigating Overvoltage Stress on Motor Windings Driven by SiC Inverters," **IEEE Transactions on Industrial Electronics**, doi: 10.1109/TIE.2025.3574543.
52. M. T. Fard ^(*), J. He, L. Wei, R. Ilka, B. Mirafzal and F. Fateh, "Mitigation of Motor Reflected Overvoltage Fed by SiC Drives—A New Solution Based on Smart Coils," **IEEE Transactions on Power Electronics**, vol. 40, no. 3, pp. 4335-4344, March 2025.
51. M. Rajabinezhad ^(*), B. Mirafzal, F. Fateh, and S. Zuo, "A Q-Learning and Fuzzy Logic Control of Hybrid Energy Storage System Using Two Stage Low-Pass Filter to Smooth Power Fluctuations in Microgrid," **International Journal of Robust and Nonlinear Control**, John Wiley & Sons, Inc., November 2024.
50. F. Sadeque ^(*), M. Gursoy ^(*), D. Sharma, and B. Mirafzal, "Autonomous Control of Inverters in Microgrid," **IEEE Transactions on Industry Applications**, vol. 60, no. 3, pp. 4313-4323, May-June 2024.
49. F. Sadeque ^(*), M. Gursoy ^(*), and B. Mirafzal, "Grid-forming inverters in a microgrid: Maintaining power during an outage and restoring connection to the utility grid without communication," **IEEE Transactions on Industrial Electronics**, vol. 71, no. 10, pp. 11796-11805, Oct. 2024.

48. T. Hossen (*), G. Amariuca and B. Mirafzal, "Integrating an analytical risk factor into a neural network framework for self-protective inverters," **IEEE Journal of Emerging and Selected Topics in Power Electronics**, vol. 12, no. 2, pp. 1535-1544, April 2024.
47. M. Gursay (*), and B. Mirafzal, "Direct vs. indirect control schemes for grid-forming inverters—Unveiling a performance comparison in a microgrid," **IEEE Access**, vol. 11, pp. 75023-75036, 2023.
46. T. Hossen (*), and B. Mirafzal, "Hidden modes of instability for inverters in weak grids," **IEEE Transactions on Industry Applications**, vol. 59, no. 4, pp. 4505-4515, July-Aug. 2023.
44. F. Sadeque (*), and B. Mirafzal, "Frequency restoration of grid-forming inverters in pulse load and plug-in events," **IEEE Journal of Emerging and Selected Topics in Industrial Electronics**, vol. 4, no. 2, pp. 580-588, April 2023.
45. T. Hossen (*), M. Gursay (*), and B. Mirafzal, "Self-protective inverters against malicious setpoints using analytical reference models," **IEEE Journal of Emerging and Selected Topics in Industrial Electronics**, vol. 3, no. 4, pp. 871-877, Oct. 2022.
43. D. Sharma, F. Sadeque (*), and B. Mirafzal, "Synchronization of inverters in grid forming mode," **IEEE Access**, vol. 10, pp. 41341-41351, 2022.
42. M.S. Pilehvar (*), D. Sharma, and B. Mirafzal, "Forming interphase microgrids in distribution systems using cooperative inverters," **CPSS Transactions on Power Electronics and Applications**, vol. 7, no. 2, pp. 186-195, June 2022.
41. J. Benzaquen (*), J. He, and B. Mirafzal, "Toward more electric powertrains in aircraft: Technical challenges and advancements," **CES Transactions on Electrical Machines and Systems**, vol. 5, no. 3, pp. 177 - 193, Sep. 2021.
40. B. Poudel, E. Amiri, P. Rastgoufard, and B. Mirafzal, "Toward less rare-earth permanent magnet in AC machines: A review," **IEEE Transactions on Magnetics**, vol. 57, no. 9, pp. 1-19, Sep. 2021.
39. F. Sadeque (*), J. Benzaquen (*), A. Adib (*), and B. Mirafzal, "Direct phase-angle detection for three-phase inverters in asymmetrical power grids," **IEEE Journal of Emerging and Selected Topics in Power Electronics**, vol. 9, no. 1, pp. 520-528, Feb. 2021.
38. Adib (*), F. Fateh, and B. Mirafzal, "Smart inverter stability enhancement in weak grids using adaptive virtual-inductance," **IEEE Transactions on Industry Applications**, vol. 57, no. 1, pp. 814-823, Jan./Feb. 2021.
37. M.S. Pilehvar (*), and B. Mirafzal, "Frequency and voltage supports by battery-fed smart inverters in mixed-inertia microgrids," **Electronics** 2020, 9, 1755.
36. Mirafzal, and A. Adib (*), "On grid-interactive smart inverters: features and advancements," **IEEE Access**, vol. 8, pp. 160526-160536, 2020.
35. J. Benzaquen (*), F. Fateh, and B. Mirafzal, "On the dynamic performance of variable-frequency AC-DC converters," **IEEE Transactions on Transportation Electrification**, vol. 6, no. 2, pp. 530-539, June 2020.
34. J. Benzaquen (*), and B. Mirafzal, "Seamless dynamics for wild-frequency active rectifiers in more electric aircraft," **IEEE Transactions on Industrial Electronics**, vol. 67, no. 9, pp. 7135-7145, Sep. 2020.
33. J. Benzaquen (*), F. Fateh, M. B. Shadmand, and B. Mirafzal, "Performance comparison of active rectifier control schemes in more electric aircraft applications," **IEEE Transactions on Transportation Electrification**, vol. 5, no. 4, pp. 1470 - 1479, Dec. 2019.
32. Adib (*), K. K. Afridi, M. Amirabadi, F. Fateh, M. Ferdowsi, B. Lehman, L. H. Lewis, B. Mirafzal, M. Saeedifard, M. B. Shadmand, and P. Shamsi, "E-Mobility — advancements and challenges," **IEEE Access**, vol. 7, pp. 165226-165240, 2019.

31. Singh (*), and B. Mirafzal, "An efficient grid-connected three-phase single-stage boost current source inverter," *IEEE Power and Energy Technology Systems Journal*, vol. 6, no. 3, pp. 142-151, Sep. 2019.
30. Adib (*), and B. Mirafzal, "Virtual inductance for stable operation of grid-interactive voltage source inverters," *IEEE Transactions on Industrial Electronics*, vol. 66, no. 8, pp. 6002-6011, Aug. 2019.
29. J. Benzaquen (*), M. B. Shadmand, B. Mirafzal, "Ultrafast rectifier for variable-frequency applications," *IEEE Access*, vol. 7, pp. 9903-9911, Jan. 2019.
28. M. Pilehvar (*), M. B. Shadmand, B. Mirafzal, "Analysis of smart loads in nanogrids," *IEEE Access*, vol. 7, pp. 548 – 562, Jan. 2019.
27. Adib (*), J. Lamb (*), and B. Mirafzal, "Ancillary services via VSIs in microgrids with maximum DC-bus voltage utilization," *IEEE Transactions on Industry Applications*, vol. 55, no. 1, pp. 648-658, Jan./Feb. 2019.
26. S. Choi, M. S. Haque, M. Tarek, V. Mulpuri, Y. Duan, S. Das, V. Garg, D. Ionel, M. Masrur, B. Mirafzal, and H. Toliyat, "Fault diagnosis techniques for permanent magnet AC machine and drives– A review of the current state of the art," *IEEE Transactions on Transportation Electrification*, vol. 4, no. 2, pp. 444 – 463, June 2018.
25. J. Lamb (*), B. Mirafzal, and F. Blaabjerg "PWM common-mode reference generation for maximizing the linear modulation region of CHB converters in islanded microgrids," *IEEE Transactions on Industrial Electronics*, vol. 65, no. 7, pp. 5250 – 5259, July 2018.
24. Singh (*), J. Benzaquen (*), and B. Mirafzal, "Current source generator-converter topology for direct-drive wind turbines," *IEEE Transactions on Industry Applications*, vol. 54, no. 2, pp. 1663 – 1670, March/April 2018.
25. Adib (*), B. Mirafzal, X. Wang, and F. Blaabjerg "On stability of voltage source inverters in weak grids," *IEEE Access*, vol. 6, pp. 4427 – 4439, Jan. 2018.
22. Singh (*), and B. Mirafzal, "Indirect boost matrix converter and low-voltage generator for direct-drive wind turbines," *The Journal of Engineering*, Iss. 1, pp. 10-16, Nov. 2017.
21. Singh (*), and B. Mirafzal, "A generator-converter topology with zero DC-link impedance for direct-drive wind turbines," *IEEE Transactions on Energy Conversion*, vol. 32, no. 4, pp. 1620–1623, Dec. 2017.
20. J. Lamb (*), and B. Mirafzal, "Grid-interactive cascaded H-bridge multilevel converter PQ plane operating region analysis," *IEEE Transactions on Industry Applications*, vol. 53, no. 6, pp. 5744–5752, Nov./Dec. 2017.
19. J. Lamb (*), and B. Mirafzal, "Open-circuit IGBT fault detection and location isolation for cascaded multilevel converters," *IEEE Transactions on Industrial Electronics*, vol. 64, no.6, pp. 4846 - 4856, June 2017.
18. J. Lamb (*), and B. Mirafzal, "An adaptive SPWM technique for cascaded multilevel converters with time-variant DC sources," *IEEE Transactions on Industry Applications*, vol. 52, no. 5, pp. 4146 – 4155, September/October 2016.
17. J. Lamb (*), A. Singh (*), and B. Mirafzal, "Rapid implementation of solid-state based converters in power engineering laboratories," *IEEE Transactions on Power Systems*, vol. 31, no. 4, pp. 2957 – 2964, July. 2016.
16. Singh (*), A. K. Kaviani (*), and B. Mirafzal, "On dynamic models and stability analysis of three-phase phasor PWM-based CSI for stand-alone applications," *IEEE Transactions on Industrial Electronics*, vol. 62, no. 5, pp. 2698 – 2707, May 2015.
15. B. Mirafzal, "Survey of fault-tolerance techniques for three-phase voltage source inverters," *IEEE Transactions on Industrial Electronics*, vol. 61, no. 10, pp. 5192-5202, Oct. 2014.
14. S. Ochs (*), B. Mirafzal, and P. Stooder (*), "A method of seamless transitions between grid-tied and stand-alone modes of operation for utility-interactive inverters," *IEEE Transactions on Industry Applications*, vol. 50, no. 3, pp. 1934-1941, May/June 2014.

13. K. Kaviani (*), B. Hadley (*), and B. Mirafzal, "A time-coordination approach for regenerative energy saving in multi-axis motor-drive systems," *IEEE Transactions on Power Electronics*, vol. 27, no. 2, pp. 931 - 941, February 2012.
12. Sayed-Ahmed, B. Mirafzal, and N. Demerdash, "A fault-tolerant technique for Δ -connected AC motor-drives," *IEEE Transactions on Energy Conversion*, vol. 26, no. 2, pp. 646 - 653, June 2011. (*IEEE Transactions IEEE PES Society Paper Award*)
11. B. Mirafzal, M. Saghaleini (*), and A. K. Kaviani (*), "An SVPWM-based switching pattern for stand-alone and grid-connected three-phase single-stage boost-inverters," *IEEE Transactions on Power Electronics*, vol. 26, no. 4, pp. 1102 - 1111, April 2011.
10. V. Salehi (*), S. Afsharnia, and B. Mirafzal, "Voltage stability improvement for wind farms using shunt FACTS devices based on dynamic modeling," *International Journal of Distributed Energy Resources*, ISSN 1614-7138, vol.6, no. 2, pp. 109-130, April-June 2010.
9. B. Mirafzal, G. Skibinski, and R. Tallam, "A failure mode for PWM inverter-fed AC motors due to the antiresonance phenomenon," *IEEE Transactions on Industry Applications*, vol. 45, no. 5, pp. 1697-1705, September/October 2009.
8. B. Mirafzal, G. Skibinski, and R. Tallam, "Determination of parameters in the universal induction motor model," *IEEE Transactions on Industry Applications*, vol.45, no. 1, pp. 142 - 151, January/February 2009.
7. B. Mirafzal, G. Skibinski, R. Tallam, D. Schlegel, and R. Lukaszewski, "Universal induction motor model with low-to-high frequency response characteristics," *IEEE Transactions on Industry Applications*, vol.43, no. 5, pp. 1233 - 1246, September/October 2007. (*IEEE Transactions IEEE IAS Society Paper Award*)
6. B. Mirafzal, R. Povinelli, and N. Demerdash, "Inter-turn fault diagnosis in induction motors using pendulous oscillation phenomenon," *IEEE Transactions on Energy Conversion*, vol.21, no. 4, pp.871-882, December 2006.
5. M. Solveson, B. Mirafzal, and N. Demerdash, "Soft started induction motor modeling and heating issues for different starting profiles using a flux linkage ABC-frame of reference," *IEEE Transactions on Industry Applications*, vol.42, no. 4, pp.973-982, July/August 2006.
4. B. Mirafzal, and N. Demerdash, "On innovative methods of induction motor inter-turn and broken-bar fault diagnostics," *IEEE Transactions on Industry Applications*, vol.42, no. 2, pp.405-414, March/April 2006.
3. B. Mirafzal, and N. Demerdash, "Effects of load magnitude on diagnosing broken bar faults in induction motors using the pendulous oscillation of the rotor magnetic field orientation," *IEEE Transactions on Industry Applications*, vol.41, no. 3, pp.771-783, May/June 2005.
2. B. Mirafzal, and N. Demerdash, "Induction machine fault diagnosis using the rotor magnetic field space vector orientation," *IEEE Transactions on Industry Applications*, vol.40, no. 2, pp.534-542, March/April 2004.
1. M. Mirafzal, and B. Mirafzal, "On the oscillation problem of second nonlinear Euler type differential equations," *International Journal of Differential Equations and Applications*, vol.9, pp.187-198, 2004.

Conference Publications [*] denotes graduate student]:

93. Y. Abdolahi (*), B. Mirafzal, F. Fateh, "DL-Predictive Control of GFM Inverters for Inrush Current Mitigation and Overload Protection," *2025 IEEE Kansas Power and Energy Conference (KPEC)*, Manhattan, KS, USA, 2025, pp. 1-6.
92. A. Sadasivan (*), B. Mirafzal, "High-Power Planar Transformer Design for Four-Port Converters," *2025 IEEE Applied Power Electronics Conference and Exposition (APEC)*, Atlanta, GA, USA, 2025, pp. 2461-2467.
91. M. Sadoughi (*), F. Fateh, J. He and B. Mirafzal, "Challenges and Solutions for Uneven Voltage Distribution in SiC-Driven AC Motors," *2024 IEEE Energy Conversion Congress and Exposition (ECCE)*, Phoenix, AZ, USA, 2024, pp. 2151-2156.

90. M. Sadoughi (*), F. Fateh and B. Mirafzal, "Overvoltage Stress on AC Motor Winding Insulations Driven by Fast-Switching Inverters: A Study," [2024 IEEE Kansas Power and Energy Conference \(KPEC\)](#), Manhattan, KS, USA, 2024, pp. 1-6.
89. A. Sadasivan (*), F. Fateh and B. Mirafzal, "Design of Planar Transformers for Multiport Converters: A Study," [2024 IEEE Kansas Power and Energy Conference \(KPEC\)](#), Manhattan, KS, USA, 2024, pp. 1-6.
88. F. Sadeque (*), M. Gursoy (*), F. Fateh and B. Mirafzal, "Control-Sync: A Method for Grid-Forming Inverters," [2024 IEEE Applied Power Electronics Conference and Exposition \(APEC\)](#), Long Beach, CA, USA, 2024, pp. 1248-1254.
87. M. Sadoughi (*), A. Sadasivan (*), F. Fateh, J. He and B. Mirafzal, "Mitigation of Uneven Overvoltage Distribution in Motor Windings Fed by SiC-Based Drives Using a GaN-Based Adaptive Surge Impedance Method," [2024 IEEE Applied Power Electronics Conference and Exposition \(APEC\)](#), Long Beach, CA, USA, 2024, pp. 2385-2391.
86. M. Gursoy (*), F. Sadeque (*), F. Fateh and B. Mirafzal, "Direct Control Methods for Grid-Forming and Grid-Following Inverters," [2023 IEEE Energy Conversion Congress and Exposition \(ECCE\)](#), Nashville, TN, USA, 2023, pp. 1081-1088.
85. M. Sadoughi (*), A. Sadasivan (*), A. Howard (*), F. Fateh, J. He and B. Mirafzal, "Mitigating High-Frequency Overvoltage on Motor Windings: An Adaptive Approach," [2023 IEEE Energy Conversion Congress and Exposition \(ECCE\)](#), Nashville, TN, USA, 2023, pp. 5170-5176.
84. F. Sadeque (*), M. Gursoy (*) and B. Mirafzal, "Survey of Control Methods for Grid-Forming Inverters – Advancements from 2020 to 2023," [2023 IEEE Kansas Power and Energy Conference \(KPEC\)](#), Manhattan, KS, USA, 2023, pp. 1-6.
83. T. Hossen (*) and B. Mirafzal, "A Study on Self-Security of Smart Inverters," [2023 IEEE Kansas Power and Energy Conference \(KPEC\)](#), Manhattan, KS, USA, 2023, pp. 1-6.
82. T. Hossen (*) and B. Mirafzal, "Self-Protective Inverters for Enhancing the Security of Smart Power Grids," [2023 IEEE Kansas Power and Energy Conference \(KPEC\)](#), Manhattan, KS, USA, 2023, pp. 1-6.
81. M. T. Fard (*), J. He, M. Sadoughi (*), B. Mirafzal, and F. Fateh, "Smart coils for mitigation of motor reflected overvoltage fed by SiC drives," in [Proc. IEEE Applied Power Electronics Conference & Exposition \(APEC\)](#), Orlando, FL, 2023, pp. 1429-1436.
80. T. Hossen (*), F. Sadeque (*), F. Fateh and B. Mirafzal, "Projection of safe operation for inverters using artificial intelligence-based stability criterion," in [Proc. IEEE Applied Power Electronics Conference & Exposition \(APEC\)](#), Orlando, FL, 2023, pp. 3083-3088.
79. F. Sadeque (*), D. Sharma, and B. Mirafzal, "Seamless grid-following to grid-forming transition of inverters supplying a microgrid," in [Proc. IEEE Applied Power Electronics Conference & Exposition \(APEC\)](#), Orlando, FL, 2023, pp. 594-599.
78. T. Hossen (*), and B. Mirafzal, "On stability of PQ-controlled grid-following and droop-control grid-forming inverters," in [Proc. IEEE Energy Conversion Congress and Exposition Conf. \(ECCE\)](#), Detroit, Michigan, Oct. 2022.
77. M. Gursoy (*), and B. Mirafzal, "Inrush current mitigation for grid-forming inverters in islanded microgrids," in [Proc. IEEE Energy Conversion Congress and Exposition Conf. \(ECCE\)](#), Detroit, Michigan, Oct. 2022.
76. F. Sadeque (*), and B. Mirafzal, "A universal controller for grid-forming inverters in microgrid during islanding for low transient current," in [Proc. IEEE International Conference on Industrial Electronics: Developments & Applications](#), India, Oct. 2022, pp. 62-67.
75. M. Gursoy (*), and B. Mirafzal, "Dynamic load inrush current mitigation in islanded microgrids powered by grid-forming inverters," in [Proc. IEEE International Conference on Industrial Electronics: Developments & Applications](#), India, Oct. 2022, pp. 73-77.
74. T. Hossen (*), and B. Mirafzal, "On projection of safe operation for grid-following inverters – Grid parameter estimation," in [Proc. IEEE International Conference on Industrial Electronics: Developments & Applications](#), India, Oct. 2022, pp. 68-72.

73. F. Sadeque (*), D. Sharma, and B. Mirafzal, "Multiple grid-forming inverters in black-start: The challenges," in [Proc. IEEE Workshop on Control and Modeling for Power Electronics \(COMPEL\)](#), Colombia, Nov. 2021.
72. F. Sadeque (*), D. Sharma, and B. Mirafzal, "Power-sharing between grid-forming and grid-following inverters," in [Proc. IEEE Workshop on Control and Modeling for Power Electronics \(COMPEL\)](#), Colombia, Nov. 2021.
71. M. Gursoy (*), and B. Mirafzal, "Self-security for grid-interactive smart inverters using steady-state reference model," in [Proc. IEEE Workshop on Control and Modeling for Power Electronics \(COMPEL\)](#), Colombia, Nov. 2021.
70. T. Hossen (*), D. Sharma, and B. Mirafzal, "Smart inverter twin model for anomaly detection," in [Proc. IEEE Workshop on Control and Modeling for Power Electronics \(COMPEL\)](#), Colombia, Nov. 2021.
69. T. Hossen (*), M. Gursoy (*), and B. Mirafzal, "Digital twin for self-security of smart inverters," in [Proc. IEEE Energy Conversion Congress and Exposition Conf. \(ECCE\)](#), Vancouver, Canada, Oct. 2021.
68. F. Sadeque (*), and B. Mirafzal, "Cooperative inverters to overcome PLL malfunctions," in [Proc. IEEE International Symposium on Power Electronics for Distributed Generation Systems \(PEDG\)](#), Chicago, IL, June 2021.
67. M. Gursoy (*), and B. Mirafzal, "On self-security of grid-interactive smart inverters," in [Proc. IEEE Kansas Power and Energy Conference \(KPEC\)](#), 2021.
66. J. Benzaquen (*), and B. Mirafzal, "Smart active rectifier fed by a variable voltage and frequency source," in [Proc. IEEE Kansas Power and Energy Conference \(KPEC\)](#), 2021.
65. T. Hossen (*), F. Sadeque (*), M. Gursoy (*), and B. Mirafzal, "Self-secure inverters against malicious setpoints," in [Proc. IEEE Electric Power and Energy Conference \(EPEC\)](#), Edmonton, AB, Canada, 2020.
64. M. S. Pilehvar (*), and B. Mirafzal, "PV-fed smart inverters for mitigation of voltage and frequency fluctuations in islanded microgrids," in [Proc. 2020 International Conference on Smart Grids and Energy Systems \(SGES\)](#), 2020, pp. 807-812.
63. M. S. Pilehvar (*), and B. Mirafzal, "Smart inverters for seamless reconnection of isolated residential microgrids to utility grid," in [Proc. 2020 IEEE Electric Power and Energy Conference \(EPEC\)](#), 2020.
62. M. S. Pilehvar and B. Mirafzal, "Energy-storage fed smart inverters for mitigation of voltage fluctuations in islanded microgrids," in [Proc. 2020 IEEE Electric Power and Energy Conference \(EPEC\)](#), 2020.
61. M. S. Pilehvar (*), and B. Mirafzal, "A frequency control method for islanded microgrids using energy storage systems," in [Proc. IEEE Applied Power Electronics Conference & Exposition \(APEC\)](#), New Orleans, LA, 2020, pp. 2327-2332.
60. J. Benzaquen (*), and B. Mirafzal, "An active rectifier fed by a variable-speed generator," in [Proc. IEEE Applied Power Electronics Conference & Exposition \(APEC\)](#), New Orleans, LA, 2020, pp. 1691-1696.
59. Adib (*), F. Fateh, and B. Mirafzal, "A stabilizer for inverters operating in grid-feeding, grid-supporting and grid-forming modes," in [Proc. IEEE Energy Conversion Congress and Exposition \(ECCE\)](#), Baltimore, MD, 2019, pp. 2239-2244.
58. J. Benzaquen (*), A. Adib (*), F. Fateh, and B. Mirafzal, "A model predictive control scheme formulation for active rectifiers with LCL filter," in [Proc. IEEE Energy Conversion Congress and Exposition \(ECCE\)](#), Baltimore, MD, 2019, pp. 3758-3763.
57. J. Benzaquen (*), M. B. Shadmand, F. Fateh, and B. Mirafzal, "Model reference adaptive one-step-ahead control scheme for active rectifiers in wild frequency applications," in [Proc. IEEE Applied Power Electronics Conference & Exposition \(APEC\)](#), Anaheim, CA, March 2019, pp. 588-593.

56. M. S. Pilehvar (*), M. B. Shadmand, and B. Mirafzal, "Smart loads for power quality and battery lifetime improvement in nanogrids," in [Proc. IEEE Applied Power Electronics Conference & Exposition \(APEC\)](#), Anaheim, CA, March 2019, pp. 1487-1493.
55. M. Easley (*), S. Jain, M. B. Shadmand, F. Fateh, and B. Mirafzal, "Hierarchical model predictive control for cascaded multilevel inverters," in [Proc. IEEE Applied Power Electronics Conference & Exposition \(APEC\)](#), Anaheim, CA, March 2019, pp. 614-619.
54. S. D'silva (*), P. Nanduri, S. Jain, F. Fateh, M. B. Shadmand, and B. Mirafzal, "Autonomous power reserve control for cluster of photovoltaic sources in microgrids," in [Proc. IEEE Applied Power Electronics Conference & Exposition \(APEC\)](#), Anaheim, CA, March 2019, pp. 167-173.
53. M. S. Pilehvar (*), J. Benzaquen (*), M. B. Shadmand, A. Pahwa, B. Mirafzal, J. McDaniel, D. Rogge, and J. Erickson, "Modeling, control, and stability of smart loads toward grid of nanogrids for smart cities," in [Proc. IEEE Industrial Electronics Society Conf. \(IECON\)](#), Washington DC, October 2018, pp. 4045-4050.
52. J. Benzaquen (*) and B. Mirafzal, "Asymmetrical multi-coil wireless EV charger with enhanced misalignment tolerance," in [Proc. IEEE Industrial Electronics Society Conf. \(IECON\)](#), Washington DC, October 2018, pp. 4781-4786.
51. Adib (*), F. Fateh, M. B. Shadmand, and B. Mirafzal, "A reduced-order technique for stability investigation of voltage source inverters," in [Proc. IEEE Energy Conversion Congress and Exposition \(ECCE\)](#), Portland, OR, September 2018, pp. 5351-5356.
50. Adib (*), F. Fateh, M. B. Shadmand, and B. Mirafzal, "Weak grid impacts on stability of voltage source inverters - asymmetrical grid," in [Proc. IEEE Energy Conversion Congress and Exposition \(ECCE\)](#), Portland, OR, September 2018, pp. 3055-3060.
49. Adib (*), F. Fateh, B. Mirafzal, "Weak grid impacts on the design of voltage source inverters – virtual inductance" in [Proc. IEEE Workshop on Control and Modeling for Power Electronics \(COMPEL\)](#), Padova, Italy, June 25-28, 2018.
48. J. Benzaquen (*), M. Shadmand, A. Stonestreet, and B. Mirafzal, "A unity power factor active rectifier with optimum space-vector predictive DC voltage control for variable frequency supply suitable for more electric aircraft applications," in [Proc. IEEE Applied Power Electronics Conf. \(APEC\)](#), San Antonio, TX, March 2018, pp. 1455-1460.
47. Adib (*), J. Lamb (*), and B. Mirafzal, "Atypical PWM for maximizing 2L-VSI DC-bus utilization in inverter-based microgrids with ancillary services," in [Proc. IEEE Applied Power Electronics Conf. \(APEC\)](#), Dallas, TX, March 2018, pp. 2343-2348.
46. S. Jain, M. Easley (*), M. B. Shadmand, B. Mirafzal, "Decoupled active and reactive power predictive control of impedance source microinverter with LVRT capability," in [Proc. IEEE Power and Energy Conference](#), Illinois, Feb. 2018.
45. J. Lamb (*), and B. Mirafzal, "Active and reactive power operational region for grid-interactive cascaded H-bridge multilevel converters," in [Proc. IEEE Energy Conversion Congress and Exposition Conf. \(ECCE\)](#), Milwaukee, WI, Sept. 2016.
44. Singh (*), and B. Mirafzal, "A generator-converter design for direct-drive wind turbines," in [Proc. IEEE Energy Conversion Congress and Exposition Conf. \(ECCE\)](#), Milwaukee, WI, Sept. 2016.
43. Singh (*), and B. Mirafzal, "Three-phase single-stage boost inverter for direct-drive wind turbines," in [Proc. IEEE Energy Conversion Congress and Exposition Conf. \(ECCE\)](#), Milwaukee, WI, Sept. 2016.
42. Singh (*), and B. Mirafzal, "A low-voltage generator-converter topology for direct-drive wind Turbines," in [Proc. IEEE International Symposium on Power Electronics for Distributed Generation Systems \(PEDG\)](#), Vancouver, Canada, June 2016.
41. J. Lamb (*), and B. Mirafzal, "Active and reactive power operational region for grid-tied inverters," in [Proc. IEEE International Symposium on Power Electronics for Distributed Generation Systems \(PEDG\)](#), Vancouver, Canada, June 2016.
40. O. Dag, and B. Mirafzal, "On stability of islanded low-inertia microgrids," in [Proc. 2016 Clemson University Power Systems Conference \(PSC\)](#), 2016.

39. J. Lamb (*), and B. Mirafzal, "An adaptive SPWM technique for cascaded multilevel converters," in [Proc. IEEE Energy Conversion Congress and Exposition Conf. \(ECCE\)](#), Montreal, QC, Sept. 2015, pp. 703- 708.
38. Singh (*), A. A. Milani (*), and B. Mirafzal, "Modified phasor pulse width modulation method in three-phase single-stage boost inverter," in [Proc. IEEE Applied Power Electronics Conf. \(APEC\)](#), Dallas, TX, March 2014, pp. 1276-1280.
37. Singh (*), A. A. Milani (*), and B. Mirafzal, "Voltage regulation in single-stage boost inverter using modified phasor pulse width modulation method for stand-alone applications," in [Proc. IEEE Applied Power Electronics Conf. \(APEC\)](#), Dallas, TX, March 2014, pp. 3011-3016.
36. D. S. Ochs (*), P. Sotoodeh (*), and B. Mirafzal, "A technique for voltage-source inverter seamless transitions between grid-connected and standalone modes," in [Proc. IEEE Applied Power Electronics Conf. \(APEC\)](#), Long Beach, CA, March 2013, pp. 954-959.
35. K. Kaviani (*), and B. Mirafzal, "Stability analysis of the three-phase single-stage boost inverter," in [Proc. IEEE Applied Power Electronics Conf. \(APEC\)](#), Long Beach, CA, March 2013, pp. 918-923.
34. K. Kaviani (*), and B. Mirafzal, "Dynamic model of three-phase single-stage boost inverter for grid-connected applications," in [Proc. IEEE Energy Conversion Congress and Exposition Conf. \(ECCE\)](#), Raleigh, NC, Sept. 2012, pp. 4627- 4634.
33. Mirafzal, and S. Das, "Condition monitoring and fault-tolerance agents for grid-tied inverters," in [Proc. IEEE Power and Energy Society General Meeting Conf.](#), San Diego, CA, July 2012, pp. 1-3.
32. M. Saghaleini (*), and B. Mirafzal, "Reactive power control in a three-phase grid-connected current-source boost-inverter," in [Proc. IEEE Applied Power Electronics Conf. \(APEC\)](#), Orlando, FL, February 2012, pp. 904-910.
31. K. Kaviani (*), B. Mirafzal, and K. Yen, "Dynamic model of three-phase current source boost inverter for stand-alone applications," in [Proc. IEEE Applied Power Electronics Conf. \(APEC\)](#), February 2012, pp. 218-224.
30. K. Kaviani (*), and B. Mirafzal, "A switching pattern for single-phase single-stage current source boost inverter," in [Proc. IEEE Applied Power Electronics Conf. \(APEC\)](#), Orlando, FL, February 2012, pp. 2066-2071.
29. M. Saghaleini (*), and B. Mirafzal, "Power control in three-phase grid-connected current-source boost inverter," in [Proc. IEEE Energy Conversion Congress and Exposition Conf. \(ECCE\)](#), Phoenix, AZ, 2011, pp. 776 - 783.
28. K. Kaviani (*), B. Hadley (*), and B. Mirafzal, "Regenerative energy saving in multi-axis servo-motor-drives," in [Proc. IEEE Energy Conversion Congress and Exposition Conf. \(ECCE\)](#), Phoenix, AZ, Sept. 2011, pp. 3450 - 3457.
27. H. Afshari (*), M. Saghaleini (*), A. K. Kaviani (*), B. Hadley (*), and B. Mirafzal, "A time-coordination approach for compensating pulse-load using flywheel," in [Proc. IEEE Energy Conversion Congress and Exposition Conf. \(ECCE\)](#), Phoenix, AZ, Sept. 2011, pp. 109 - 115.
26. M. Saghaleini (*), A. K. Kaviani (*), B. Hadley (*), and B. Mirafzal, "New trends in photovoltaic energy systems," in [Proc. 10th International Conference on Environment and Electrical Engineering Conf.](#), June 2011.
25. Sayed-Ahmed, B. Mirafzal, and N. Demerdash, "A fault-tolerant technique for delta-connected vector-control AC motor-drives," in [Proc. IEEE Applied Power Electronics Conf. \(APEC\)](#), Fort Worth, TX, March 2011, pp. 1034 - 1041.
24. Sayed-Ahmed, B. Mirafzal, and N. Demerdash, "Continued operation of delta-connected AC motor-drive systems under short-circuit fault," in [Proc. IEEE International Electric Machines and Drives Conf. \(IEMDC\)](#), Niagara Falls, Canada, May 2011, pp. 669-674.
23. Hadley (*), B. Mirafzal, and D. Ionel, "On power-sharing of solar-based hybrid motor-drive systems," in [Proc. IEEE Energy Conversion Congress and Exposition Conf. \(ECCE\)](#), Atlanta, GA Sep. 2010, pp. 695-701.

22. Nejadpak (*), B. Mirafzal, O. Mohammed, and L. Wei, "Effects of different switching algorithms on the thermal behavior of IGBT modules under pulse-load conditions," in *Proc. IECON 2010 - 36th Annual Conf. on IEEE Industrial Electronics Society*, Phoenix, AZ, Nov. 2010, pp. 451-456.
21. M. Saghaleini (*), B. Mirafzal, and C. Edrington, "Regenerative energy management for pulse-loads in dual DC-AC micro-grids," in *Proc. IECON 2010 - 36th Annual Conf. on IEEE Industrial Electronics Society*, Phoenix, AZ, Nov. 2010, pp. 674-679.
20. Sarikhani (*), B. Mirafzal, and O. Mohammed, "Inter-turn fault diagnosis of PM synchronous generator for variable speed wind applications using floating space vector," in *Proc. IECON 2010 - 36th Annual Conf. on IEEE Industrial Electronics Society*, Phoenix, AZ, Nov. 2010, pp. 2628-2633.
19. K. Kaviani (*), B. Mirafzal, and O. Mohammed, "Optimal load coordination in a hybrid bi-axis drive system using genetic algorithm," in *Proc. IECON 2010 - 36th Annual Conf. on IEEE Industrial Electronics Society*, Phoenix, AZ, Nov. 2010, pp. 939-944.
18. V. S. Pour-Mehr (*), B. Mirafzal, and O. Mohammed, "Pulse-load effects on ship power system stability," in *Proc. IECON 2010 - 36th Annual Conf. on IEEE Industrial Electronics Society*, Phoenix, AZ, Nov. 2010, pp. 3353-3358.
17. M. M. Amin (*), B. Mirafzal, and O. Mohammed, "A DC-bus voltage regulation for parallel wind-based synchronous generators," in *Proc. IECON 2010 - 36th Annual Conf. on IEEE Industrial Electronics Society*, Phoenix, AZ, Nov. 2010, pp. 3161-3166.
16. Mirafzal, G. Skibinski, and R. Tallam, "A failure mode for PWM inverter-fed AC motors due to the anti-resonance phenomenon," in *Proc. IEEE Industry Applications Society Conf. (IAS Annual Meeting)*, Edmonton, Canada, Oct. 2008.
15. M. Gries, and B. Mirafzal, "Permanent magnet motor-drive frequency response characteristics for transient phenomena and conducted EMI analysis," in *Proc. IEEE Applied Power Electronics Conf. (APEC)*, Austin, TX, February 2008, pp. 1767-1775.
14. Mirafzal, G. Skibinski, and R. Tallam, "Determination of parameters in the universal induction motor model," in *Proc. IEEE Industry Applications Society Conf. (IAS Annual Meeting)*, New Orleans, LA, Oct. 2007, pp.1207 - 1216.
13. Mirafzal, G. Skibinski, R. Tallam, D. Schlegel, and R. Lukaszewski, "Universal induction motor model with low-to-high frequency response characteristics," in *Proc. IEEE Industry Applications Society Conf. (IAS Annual Meeting)*, Tampa, FL, vol.1, Oct. 2006, pp. 423-433.
12. Sayed-Ahmed, C. Yeh, B. Mirafzal, and N. Demerdash, "Analysis of stator winding inter-turn short-circuit faults in poly-phase induction machines for identification of the faulty phase and estimation of the fault severity," in *Proc. IEEE Industry Applications Society Conf. (IAS Annual Meeting)*, Tampa, FL, vol.3, Oct. 2006, pp. 1519-1524.
11. J. Xu, X. Feng, B. Mirafzal, and N. Demerdash, "Application of optimal fuzzy PID controller design: PI control for nonlinear induction motor," in *Proc. The Sixth World Congress on Intelligent Control and Automation Conf.*, China, June 2006, pp. 3953-3957.
10. Mirafzal, and N. Demerdash, "On innovative methods of induction motor inter-turn and broken-bar fault diagnostics," in *Proc. IEEE International Electric Machines and Drives Conf. (IEMDC)*, San Antonio, TX, May 2005, pp.762-769. (Invited paper)
9. Yeh, B. Mirafzal, R. Povinelli, and N. Demerdash, "A Condition monitoring vector database approach for broken bar fault diagnostics of induction machines," in *Proc. IEEE International Electric Machines and Drives Conf. (IEMDC)*, San Antonio, TX, May 2005, pp.29-34.
8. Mirafzal, F. Fateh, C. Yeh, R. Povinelli, and N. Demerdash, "Condition monitoring of squirrel-cage induction motors fed by PWM -based drives using a parameter estimation approach," in *Proc. International Conf. on Power System Technology*, Singapore, vol.2, November 2004, pp.1579-1584.
7. Yeh, R. Povinelli, B. Mirafzal, and Nabeel A.O. Demerdash, "Diagnosis of stator winding inter-turn shorts in induction motors fed by PWM-inverter drive systems using a time-series data

- mining technique," in [Proc. International Conf. on Power System Technology](#), Singapore, vol.1, November 2004, pp.891-896.
6. Mirafzal, and N. Demerdash, "Effects of load on diagnosing broken bar faults in induction motors using the pendulous oscillation of the rotor magnetic field orientation," in [Proc. IEEE Industry Applications Society Conf. \(IAS Annual Meeting\)](#), Seattle, WA, vol.2, Oct. 2004, pp.699-707.
 5. M. Solveson, B. Mirafzal, and N. Demerdash, "Soft started induction motor modeling and heating issues for different starting profiles using a flux linkage ABC-frame of reference," in [Proc. IEEE Industry Applications Society Conf. \(IAS Annual Meeting\)](#), Seattle, WA, vol.1, October 2004, pp.18-25.
 4. Mirafzal, and N. Demerdash, "Induction machine fault diagnosis using the rotor magnetic field space vector orientation," in [Proc. IEEE Industry Applications Society Conf. \(IAS Annual Meeting\)](#), Salt Lake City, UT, vol.3, October 2003, pp.1847-1854.
 3. Mirafzal, and N. Demerdash, "Effects of inductance nonlinearities in a transformer-rectifier DC motor drive system on the AC side harmonic distortion using a time-stepping coupled finite element-circuit technique," in [Proc. IEEE International Electric Machines and Drives Conf. \(IEMDC\)](#), Madison, WI, vol.3, June 2003, pp.1755-1759.
 2. Mirafzal, and N. Demerdash, "A nonlinear controller for current source inverter induction motor drive systems," in [Proc. IEEE International Electric Machines and Drives Conf. \(IEMDC\)](#), Madison, WI, vol.3, June 2003, pp.1491-1497.
 1. G. Radman, and B. Mirafzal, "Improvement of transient stability using a thyristor-controlled series compensator," in [Proc. 31st Southeastern Symposium on System Theory, SSST'99](#) Alabama, March 1999, pp. 219-221.

New Graduate Courses

- Motor Drive Systems, Mirafzal, Spring 2021, KSU
- System Identification Techniques, Fateh and Mirafzal, Spring 2019, KSU
- Power Electronics for Renewable Energy Systems, Mirafzal, Spring 2013, KSU
- Elements of Renewable Energy Conversion Systems, Mirafzal, Spring 2010, FIU
- EMI Emission in Power Converters, Mirafzal, Spring 2007, MU

Courses Taught [*] denotes graduate level]:

- Advanced Power Electronics [*]: Spring 2012 - 2024 KSU
- Power Electronics: Fall 2011 - 2023 KSU
- Energy Conversion Systems: Spring and Fall 2018, 2019 KSU
- Power Laboratory, Spring 2015 - 2024 KSU
- Circuit Theory (II): Fall 2012, 2013, 2014, KSU
- Industrial Electronics [*]: Fall 2010, FIU
- Power Systems (II): Spring 2009, Fall 2009, Summer 2010, and Spring 2011, FIU
- Power Systems (III): Fall 2008, and 2010, FIU
- Energy Conversion Systems: Spring 2008, UWM
- Power Electronics: Spring 2005 and 2007, MU
- Power Systems: Spring 2006, MU
- Electric Circuits and Machinery: Fall 2006 and 2007, MU

Laboratory Development:

- Modern Power Laboratory for undergraduate students, Mirafzal, Spring 2016, KSU

- Power Electronics Research Laboratory (supported by several grants including an NSF MRI development), Mirafzal, 2012, KSU

Thesis and Dissertation of Advisees:

- Eduard Plett, **Ph.D. Dissertation**, "Optimization and Design of Hybrid Power Systems with the Daily Energy Balance Method," Defended Nov 2024.
Remarks: After his graduation, he continued his job at Kansas State University as a faculty member of the Salina campus.
- Mehmetcan Gursoy, **Ph.D. Dissertation**, "Autonomous Grid-Forming Inverters in Microgrids," Defended April 2024.
Remarks: After his graduation, he became a lead engineer at GE Aerospace, OH.
- Tareq Hossen, **Ph.D. Dissertation**, "A Reference-Model Strategy for Self-Protective Smart Inverters," Defended Aug. 2023.
Remarks: After his graduation, he became a postdoc fellow at the National Renewable Energy Laboratory (NREL), CO.
- Fahmid Sadeque, **Ph.D. Dissertation**, "Restoration and Universal Operation of Grid-Forming Inverters," Defended Aug. 2022.
Remarks: After his graduation, he became a postdoc fellow in my group, and now serves as a scientist at Pacific Northwest National Laboratory (PNNL), WA.
- Mohsen S. Pilehvar, **Ph.D. Dissertation**, "Smart inverters for seamless voltage and frequency dynamics in microgrids," Defended Jan. 2021.
Remarks: After his graduation, he became a postdoc fellow at Georgia Institute of Technology, GA.
- Joseph Benzaquen, **Ph.D. Dissertation**, "Smart Three-Phase Power Converter for More Electric Powertrains" KSU, Aug. 2020.
Remarks: He is the recipient of an IEEE APEC 2018, Outstanding Presentation Award. After his graduation, he became a postdoc fellow and now is a **research faculty** at Georgia Institute of Technology, GA.
- Peter Bontorno, **M.S. Thesis**, "Applications of Resistive Droop Control to Grid-Connected Low-Voltage Single-Phase Distributed Generators in Microgrids" KSU, Aug. 2020.
Remarks: He is working at Naval Nuclear Power, NY.
- Aswad Adib, **Ph.D. Dissertation**, "Control and Stability Enhancement of Grid-Interactive Voltage Source Inverters under Grid Abnormalities" KSU, Dec. 2018.
Remarks: He is a scientist at Oak Ridge National Laboratory (ORNL), TN.
- Jacob Lamb, **Ph.D. Dissertation**, "Corrective Switching Algorithms for Internal and External Abnormalities in Cascaded Multilevel Inverters," KSU, Aug. 2017.
Remarks: He is the recipient of the 2017 Research Award from ECE Department. He is a senior development engineer at the R&D group of Rockwell Automation, WI.
- Chintan Raval, **M.S. Thesis**, "SiC-Based Unity Power Factor Three-Phase AC-DC Power Supply," KSU, May 2017.
Remarks: He is a senior engineer at American Electric Power (AEP), OH.
- Akanksha Singh, **Ph.D. Dissertation**, "Novel Boost Current Source Inverter Topology for Direct-Drive Wind Turbines," KSU, Jan./May 2017.
Remarks: She is the recipient of the two 2016 Research Award from ECE Department. She is a research engineer at National Renewable Energy Laboratory (NREL), CO.
- Faleh Alskran, **M.S. Thesis**, "Dynamic Modeling and Analysis of the Three-phase Voltage Source Inverter under Stand-Alone and Grid-Tied Modes," KSU, Aug. 2014.
Remarks: He became a Ph.D. student at Colorado School of Mines, CO.

- Alireza A. Milani, **M.S. Thesis**, “Voltage Regulation in a Single-Stage Three-Phase Boost-Inverter using Modified Phasor Pulse Width Modulation Method for Stand-Alone Applications,” KSU, Aug. 2013.
Remarks: See refereed conference papers No. 24 and 25 in Publications List. He became a Ph.D. student, Ph.D. from North Carolina State University, NC.
- Ali K. Kaviani, **Ph.D. Dissertation**, “Dynamic Modeling and Analysis of Single-Stage Boost Inverters under Normal and Abnormal Conditions,” FIU, Aug. 2012.
Remarks: He is the recipient of a 2011 Fellowship Dissertation Award from FIU. He is a senior development engineer at Eaton Corp., OR.
- Brain Hadley, **M.S. Thesis**, “Hybrid Motor Drives: Characterization and Control,” FIU, Aug. 2011.
Remarks: He is a senior staff at Bloom Energy, DE.

Postdoctoral Fellows and Visiting Scholars:

- Dr. Fahmid Sadeque, Sep 2022 – Dec 2023
 - Working on grid-forming inverters supported by the DoE and College of Engineering
- Dr. Dushyant Sharma, Jan 2021 – Nov 2021
 - Developed the controller-sync method for grid-forming inverters supported by the DoE
- Dr. Aswad Adib, Jan 2019 – Dec 2019
 - Worked on grid-following inverters supported by the NSF and ECE Department
- Dr. Oben Dağ, Jan 2015 – Aug 2016
 - Worked on the stability of low-inertia systems supported by the Turkish Gov

Current Ph.D. Students:

- Milad Sadoughi, **Ph.D. Student**, Expected Aug 2026
- Arya Sadasivan, **Ph.D. Student**, Expected Dec 2026
- Yasin Abdolahi **Ph.D. Student**, Expected Dec 2029

Editorial Activities:

- Associate Editor, **IEEE Transactions on Power Electronics**, 2018-present
- Associate Editor, **IEEE Transactions on Industry Applications**, 2011-2021
 - IEEE-IAS Power Systems Engineering Committee, 2020-2022
 - IEEE-IAS Renewable and Energy Conversion Systems Committee, 2011-2019
- Vice Chair, IEEE IAS Renewable and Sustainable Energy Conv. Sys. Committee, Jan 2024 -
- Secretary, IEEE IAS Renewable and Sustainable Energy Conv. Sys. Committee, Jan 2022- 2023
- Advisor and Counselor, KPEC and SB IEEE IAS Chapter, USA, 2019-present

Special Issue Guest Editorial Activities:

- *Guest Editor:* For a Special Issue in the *Journal of Emerging and Selected Topics in Power Electronics* on **Advanced Technologies of Motor Drives for Zero-Emission E-Mobility 2023-2024**
- *Guest Editor:* For a Special Issue in the *IEEE Transactions on Industrial Electronics* on **Resilient and Compact Powertrains for On-the-Move Electrical Energy Technologies**, 2019-2020
- *Guest Editor:* For a Special Issue in the *IET Renewable Power Generation* on **Challenges in Future Grid-Interactive Power Converters: Control Strategies, Optimal Operation, and Corrective Actions**, 2018-2019

Invited Talks and Tutorials:

- University of South Carolina, Columbia, 2024
- Special Session, IEEE ECCE, Nashville, 2023
- Tutorial, IEEE Electric Ship Technologies Symposium, Washington DC, 2023
- Special Session, IEEE ECCE, Detroit, 2022
- Swiss Federal Institute of Technology (ETH), Zurich, 2022
- West Virginia University, WV, 2021
- Sharif University of Technology, (Virtual) 2021
- Louisiana State University, LA, 2020
- SUNY, The State University of New York, Stony Brook, NY, 2019
- Tutorial, IEEE IEMDC, San Diego, CA, 2019
- Tutorial, IEEE IAS 53rd Annual Meeting, Portland, OR, 2018
- Garmin, Kansas City, 2018
- Aalborg University, Denmark 2017
- Missouri University of Science & Technology, Rolla, MO, 2013
- Washington State University, Pullman, WA, 2011
- Oregon State University, Corvallis, OR, 2011
- Rockwell Automation, Mequon, WI, 2010
- A.O. Smith Corporation, Milwaukee, WI, 2010
- IEEE IEMDC, San Antonio, TX, May 2005

Reviewer for Funding Agencies:

- National Science Foundation (NSF), ERC Site Visitor
- National Science Foundation (NSF), USA (ECCS, MRI, ERC, SBIR Programs)
- Department of Energy (DOE), ARPA-E, DOE (SBIR Programs) USA
- University of Arkansas, ECE Graduate Program
- Louisiana Board of Regents
- University of Missouri Research Board
- Oregon-Washington University Transportation Center

Tenure and Promotion External Evaluator:

- University of New Orleans, ECE, 2020
- University of Massachusetts Lowell, ECE, 2022
- University of Nevada, Reno, ECE, 2022

Other Professional Activities:

- Technical Program Vice-Chair, IEEE ECCE, 2022, 2024, 2025
- Senior Editor IAS Annual Meeting Conference, 2025
- Member of the SDEMPED Organizing Committee, Dallas, TX, 2021
- Technical Co-Chair, IEEE IEMDC, Miami, Florida, 2009
- Technical Co-Chair, NAPS, Manhattan, Kansas, 2013
- Member of the Advisory Committee of the IEEE IEMDC, 2015

- Regional Coordinator, IEEE IES US, 2013-2015
- Member, IEEE SDEMPED 2013 Prize Paper Award Committee, 2013
- Secretary, IEEE PES Motor Sub-Committee, 2011-2013
- Track Chair: IEEE ECCE, 2017, Ohio
- Topic Chair and Session Chair: IEEE ECCE, Arizona, 2011, North Carolina, 2012, Denver, 2013
Pittsburg, 2014, Montreal 2015, Milwaukee 2016, Portland 2018, and Detroit 2022
- Session Organizer: IEEE IAS Annual Meeting, 2007, and 2008
- Technical Reviewer:
 - IET Renewable Power Generation 2018 – present
 - IEEE Transactions on Sustainable Energy, 2011- present
 - IEEE Transactions on Industrial Electronics, 2011- present
 - IEEE Transactions on Power Electronics, 2008- present
 - IEEE Transactions on Energy Conversion, 2005- present
 - IEEE Transactions on Industry Applications, 2003- present

Kansas State University Committee/Service Activities:

- Director, ECE Graduate Program Director, 2022 – present
- Member, KSU Graduate School Council, 2022 - present
- Member, KSU COE Research Award Committee, 2020, 2021
- Member, KSU Faculty Senate, 2017- 2020
- Member, KSU COE Dean 5-Years Review Committee, 2018
- Member, KSU Campus Sustainability Committee, 2017-2018
- Member, KSU ECE Department Head 5-Years Review Committee, 2016
- Chair, ECE Faculty Search Committee, 2016-2017
- Member, ECE Faculty Search Committee, 2015-2016
- Member, ECE Course and Curriculum Committee, 2013-2015
- Member, ECE Faculty Search Committee, 2012-2013
- Member, ECE Laboratory Equipment Committee, 2012-2013