ABDUL BASIT MIRZA

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EDUCATION

Doctor of Philosophy (Ph.D.) in Electrical Engineering January 2020 – August 2024
Stony Brook University, USA
University of Arkansas, USA (Transferred to Stony Brook University)
CGPA: 4.00/4.00

- Advisor: Dr. Fang Luo, Empire Innovation Associate Professor
- Dissertation: Electro-Mechanical-Thermal Co-Design and Side Effect Mitigation for a 75 kVA SiC-Based Intelligent Grid-Interface Bidirectional Converter
- Research Area: System-level design and packaging of high-density and high-power converters; side effects (EMI/EMC, Partial Discharge, and high-frequency interactions) modeling and mitigation and non-invasive health monitoring of power converters.

Master of Science (M.Sc.) in Electrical Engineering September 2020 – December 2022
Stony Brook University, USA
CGPA: 4.00/4.00

- Advisor: Dr. Fang Luo, Empire Innovation Associate Professor
- Thesis: Design and Validation of a Grid-Integrable Medium-Voltage Hybrid DC Circuit Breaker

Bachelor of Science (B.Sc.) in Electrical Engineering with Honours October 2014 – September 2018
University of Engineering and Technology, Lahore, Pakistan
CGPA: 3.88/4.00

- Subjects include: Electromagnetic Theory, Power Electronics, Power Transmission & Distribution, Power System Analysis & Design, Power System Protection and Semiconductor Devices.

WORK & RESEARCH EXPERIENCE

Lead Engineer Power Electronics August 2024 – Present
Eaton Research Labs
Eaton Corporation, Menomonee Falls, WI, USA

- Technical lead for hardware development and testing of ongoing projects sponsored by government and business units.
- Contribute to government proposal preparation.
- Contribute to the value proposition development for technical projects and programs.
- Assist in identification of leading external partnership and outside technologies.
- Contribute to IP generation through authoring or co-authoring disclosures and patents.
- Mentor junior staff and consult internal business and engineering customers.
- Participate in external open innovation events with universities and research institutions.

Power Electronics Intern May 2022 – August 2022
GE Global Research, Niskayuna, NY, USA

- **EMI Radiated Susceptibility Testing of SiC Gate Driver for Hybrid Electric Propulsion Aircraft**
  - Studied and analyzed gate driver mis-triggering under high di/dt and dv/dt due to radiated emissions.
  - Reviewed MIL-461 and DO-160 Radiated Susceptibility (RS) test standards to define H and E-fields susceptibility test levels for gate driver.
  - Investigated the effect of metallic shielding in increasing gate driver noise immunity against external H and E-fields.
  - Developed Design of Experiment (DoE) to perform RS testing of gate driver for WBG devices.

Graduate Research Assistant August 2020 – August 2024
Stony Brook University, Stony Brook, NY, USA

- **SiC-based 75 kVA Intelligent Grid-Interface Bidirectional Converter**
  - Led hardware development and testing of a 75 kVA SiC-based DC-DC-AC power converter.
  - Optimized PCB layouts for TO-247 1200 V SiC devices to maximize switching performance.
  - Designed a gapped EE-core based Integrated Magnetic Structure with decoupled Common Mode (CM) and Differential Mode (DM) inductances for a DC-DC interleaved boost converter.
  - Developed a 3-D converter-level packaging layout to achieve high power density (5.5 kW/L).
  - Designed an air-cooled three-faced utilized heat sink for thermal management.
  - Designed a FPGA and DSP based mixed-signal control card with high-speed communication link between DSP and FPGA and external fiber optic link with latency < 30 ns.
  - Coded discrete-time closed-loop control for the power converter in embedded C and Verilog.
  - Investigated switching performance of Two-Level Split-Phase (2L-SP) inverter.
  - Performed conducted EMI modeling of 2L-SP inverter and compared its performance with two-level inverter on a MIL-STD-461 standard-based test bench.
- **EMI Immune Gate Driver Design for High Speed GaN HEMT**
  - Developed EMI noise propagation path model for the gate drive circuitry.
  - Designed an EMC hardened gate driver to suppress mis-triggering due to high CM noise generated by high switching dv/dt of GaN HEMT.
  - Conducted Double Pulse Tests (DPTs) for a GaN power module without mis-triggering at 400 V/60 A (overshoot <10 %) with 185 V/ns turn-off and 180 V/ns turn-on dv/dt.
- **Broadband Electro-Magnetic Modeling and Testing for Reliable Power-Electronic-Based Energy Conversion System for Electric Aircrafts**
  - Developed a MIL-STD-461/DO-160G standard EMI test bench for analyzing impact of cable length on conducted EMI in WBG-based cable-connected motor drive systems.
  - Developed a 3.3 kV SiC-based bipolar square waveform generator for Partial Discharge (PD) testing.
  - Developed a 15 kV DC PD testing platform for cryogenic cables.
  - Investigated the influence of PWM output voltage characteristics (rise/fall time, duty cycle and frequency) of SiC-based motor drives on PD in motor winding insulation.
  - Implemented Ultra-High Frequency (UHF)-based Near-Field (H and E-field) PD detection.
- **Integration Methods for High-Density Integrated Electric Drives**
  - Investigated integration of TMR current sensors inside a double-sided cooled SiC power module.
  - Developed a slit-based PCB terminal for high bandwidth current-sensing.

Graduate Research Assistant January 2020 – August 2020
University of Arkansas, Fayetteville, AR, USA

- **Grid-Integrable Medium-Voltage Hybrid DC Circuit Breaker (HCB)**
  - Led design and development of a current injection-based HCB.
  - Designed a novel integrated E-Core magnetic structure with zero magnetic bias in normal operation.

Power Technology Research, Munich - Germany *(remote work)* September 2018-February 2019
Research Analyst – Transmission and Distribution Systems

- Developed a cost model for induction-based Distribution and Power transformers.
- Conducted market research on Solid-State transformers.

Optimal Energy Management of Multi Input based Grid Connected Converters Senior Year Project
University of Engineering and Technology, Lahore, Pakistan
Department of Electrical Engineering

- Conducted research on the use of SiC power devices to increase converter's power density and efficiency.
- Designed and developed a SiC-based Two-Input DC-DC Boost Converter, switching at 200 kHz.

TEACHING EXPERIENCE

Teaching Assistant
Department of Electrical and Computer Engineering
Stony Brook University, Stony Brook, NY, USA

- **ESE 451 Power Electronics (Spring 2023, Fall 2023 and Spring 2024)**
  - Co-taught the class with Professor Fang Luo.
  - Developed and organized homework assignments.
  - Conducted sessions on using simulation tools, including LTspice and MATLAB Simulink.
- **ESE 559 EMI in Power Electronics Converters: Generation, Propagation and Mitigation (Spring 2023 and Spring 2024)**
  - Co-taught the class with Professor Fang Luo.
  - Conducted hardware sessions focusing on measurement and quantification of EMI emissions.
- **ESE 366/566 Hardware-Software Co-Design of Embedded Systems (Fall 2022)**
  - Conducted lab sessions for graduate students.
  - Graded homework and exams.
- **ESE 280 Embedded Microcontroller Systems Design I (Fall 2020)**
  - Conducted lab sessions for students.

MENTORING EXPERIENCE

Department of Electrical and Computer Engineering August 2021 – August 2024
Stony Brook University, Stony Brook, NY, USA

- **Graduate Students**
  - Austin Zhou, M.Sc. + Ph.D. Electrical Engineering (Fall 2021 – Summer 2024)
  - Abdul Muneeb, M.Sc. + Ph.D. Electrical Engineering (Fall 2021 – Summer 2024)
  - Masayuki Hijikata, M.Sc. + Ph.D Electrical Engineering (Fall 2022 – Summer 2024)
  - John Kaplun, M.Sc. Electrical Engineering (Fall 2021 – Fall 2022)
- **Undergraduate Students**
  - Ilan Messing, B.Sc. Electrical Engineering (Fall 2023 – Summer 2024)
  - Rachel Leong, B.Sc. Electrical Engineering (Fall 2023 – Summer 2024)
  - Daniel Szewczyk, B.Sc. Electrical Engineering (Fall 2021 – Spring 2022)

HONORS / AWARDS

- Best EMC Paper Finalist for the first authored paper, presented at IEEE EMC+SIPI 2023.
- Received Armstrong Memorial Research Foundation (AMRF) Award worth $1000 for outstanding academic performance during graduate study.
- Received the William Portnoy prize paper award for the co-authored paper, presented at 2021 IEEE Energy Conversion Congress and Exposition (ECCE).
- Received Distinguished Travel Award (DTA) from Stony Brook University to attend and present paper at EPE 2022 ECCE Europe.

TRAININGS

- "Writing and Managing Federal Proposals" provided by Shipley Associates at Stony Brook University.

PATENTS

- Inventor for the provisional patent application “System and Method for Digital Twin-based Health and Fault Monitoring for Power Electronics Systems” (Provisional IP filed from Stony Brook University)
- Inventor for the provisional patent application “Integrated TMR-based Current Sensing Solution for Future High Power Density Power Electronics Systems” (Provisional IP filed from Stony Brook University)

JOURNAL PUBLICATIONS

[J1] Y. Wu, K. Choksi, S. Defaz, **A. B. Mirza** and F. Luo, "Modeling and Optimization of Near-Field Coupling Between Power Loop and Gate Drive in High-Density Bidirectional Converters," in *IEEE Transactions on Electromagnetic Compatibility.* (In Review)

[J2] **A. B. Mirza**, A. Castiblanco, A. Muneeb and F. Luo, "Impact of PCB Parasitic Capacitance on Switching Transients in Chopper and Half-Bridge Configurations Utilizing TO-247 SiC Devices," in *IEEE Transactions on Industry Applications.* (In Review)

[J3] **A. B. Mirza**, K. Choksi, S. S. Vala, A. Anwar and F. Luo, "Investigation of Reflected Wave Phenomenon in SiC-based Two-Level Split-Phase Inverter-Fed Motor Drives," in *IEEE Transactions on Power Electronics.*

[J4] K. Choksi, M. Hijikata, **A. B. Mirza**, A. Zhou, D. Singh and F. Luo, "Multi-Time-Scale Digital Twin for Health and Fault Monitoring of a Boost Converter," in *IEEE Journal of Emerging and Selected Topics in Power Electronics.*

[J5] M. R. Nielsen, S. Deng, **A. B. Mirza**, B. F. Kjærsgaard, A. B. Jørgensen, H. Zhao, Y. Li, S. M. Nielsen and F. Luo, "High-Power Electronic Applications Enabled by Medium Voltage Silicon-Carbide Technology: An Overview," in *IEEE Transactions on Power Electronics*, vol. 40, no. 1, pp. 987-1011, Jan. 2025.

[J6] **A. B. Mirza**, S. S. Vala, K. Choksi and F. Luo, "Simplified Analytical Modeling of Reflected Wave Transients in Cable-Connected VSI-Based Motor Drives With Output Reactor," in *IEEE Transactions on Power Electronics*, vol. 39, no. 10, pp. 11986-11990, Oct. 2024.

[J7] K. Choksi, M. Hijikata, Y. Wu, M. U. Hassan, D. Singh, **A. B. Mirza**, B. Li, X. Wu and F. Luo, "Investigation of Reflected Wave Phenomenon in WBG-Driven Aircraft Power System," in *IEEE Journal of Emerging and Selected Topics in Power Electronics*, vol. 12, no. 4, pp. 4259-4274, Aug. 2024.

[J8] Y. Li, M. U. Hassan, **A. B. Mirza**, Y. Xie, S. Deng, S. S. Vala, F. Luo, X. Feng, S. Narumanchi and J. D. Flicker, "State-of-the-Art Medium- and High-Voltage Silicon Carbide Power Modules, Challenges and Mitigation Techniques: A Review," in *IEEE Transactions on Components, Packaging and Manufacturing Technology.*

[J9] S. S. Vala, **A. B. Mirza** and F. Luo, "An Integrated TMR-based Current Sensing Solution for WBG Power Modules and Converters," in *IEEE Transactions on Components, Packaging and Manufacturing Technology.*

[J10] **A. B. Mirza** *et al*., " Converter-Level Packaging and Optimization for a SiC-based Grid-Interface Converter Using Discrete Devices," in *IEEE Transactions on Components, Packaging and Manufacturing Technology*.

[J11] S. S. Vala, **A. B. Mirza**, A. I. Emon and F. Luo, "A Review of Partial Discharge in Stator Winding of Rotating Machines Fed by Voltage Source PWM Motor Drives," in *IEEE Transactions on Industry Applications*, vol. 60, no. 3, pp. 3790-3807, May-June 2024

[J12] Y. Azadeh, K. Choksi, **A. B. Mirza**, X. Zhang, Y. Wu, F. Luo and K. S. Haran, "Cable and Motor Winding Impedance Interactions in Motor Drive Systems and Its Impact on HF Overvoltages," in *IEEE Transactions on Power Electronics*, vol. 39, no. 1, pp. 1244-1253, Jan. 2024.

[J13] K. Choksi, **A. B. Mirza**, A. Zhou, D. Singh, M. Hijikata and F. Luo, "Self-Evolving Digital Twin-Based Online Health Monitoring of Multiphase Boost Converters," in *IEEE Transactions on Power Electronics*, vol. 38, no. 12, pp. 16100-16117, Dec. 2023.

[J14] A. I. Emon, Y. Wu, Y. Li, **A. B. Mirza**, S. Deng and F. Luo, "A Double-Sided Cooled Split-Phase SiC Power Module With Fuzz Button Interposer," in *IEEE Journal of Emerging and Selected Topics in Power Electronics*, vol. 11, no. 5, pp. 4918-4928, Oct. 2023.

[J15] A. I. Emon, M. U. Hassan, **A. B. Mirza**, B. Narayanasamy and F. Luo, "A Figure of Merit for SiC MOSFET Power Modules to Achieve High-Power-Density Energy Conversion," in *IEEE Transactions on Electron Devices*, vol. 70, no. 7, pp. 3718-3725, July 2023.

[J16] **A. B. Mirza**, A. I. Emon, S. S. Vala and F. Luo, "An E-Core Based Integrated Coupled Inductor for Interleaved Boost Converter," in *IEEE Transactions on Industry Applications*, vol. 59, no. 4, pp. 4199-4214, July-Aug. 2023.

[J17] **A. B. Mirza**, Y. Azadeh, H. Peng, Y. Li, J. Kaplun and F. Luo, "Design and Validation of a MVDC Isolated Active Voltage Injection Based HCB," in *IEEE Transactions on Industry Applications*, vol. 59, no. 3, pp. 2842-2855, May-June 2023.

[J18] A. I. Emon, Mustafeez-ul-Hassan, **A. B. Mirza**, J. Kaplun, S. S. Vala and F. Luo, "A Review of High-Speed GaN Power Modules: State of the Art, Challenges, and Solutions," in *IEEE Journal of Emerging and Selected Topics in Power Electronics*, vol. 11, no. 3, pp. 2707-2729, June 2023.

[J19] A. I. Emon, H. Carlton, J. Harris, A. Krone, Mustafeez-ul-Hassan, **A. B. Mirza**, M. Hossain, A. Rashid, Y. Chen, F. Luo, D. Huitink and A. Mantooth "Design and Optimization of Gate Driver Integrated Multichip 3-D GaN Power Module," in *IEEE Transactions on Transportation Electrification*, vol. 8, no. 4, pp. 4391-4407, Dec. 2022.

[J20] A. I. Emon, Z. Yuan, **A. B. Mirza**, A. Deshpande, M. U. Hassan and F. Luo, "1200 V/650 V/160 A SiC+Si IGBT 3L Hybrid T-Type NPC Power Module With Enhanced EMI Shielding," in *IEEE Transactions on Power Electronics*, vol. 36, no. 12, pp. 13660-13673, Dec. 2021.

CONFERENCE PROCEEDINGS

[C1] A. Muneeb, **A. B. Mirza**, M. U. Hassan, A. Anwar, A. Castiblanco and Fang Luo, "Parasitic Capacitances in High Step Ratio Planar Transformers for Dual Active Bridge Converters: Cause and Effect," *IECON 2024 – 50th Annual Conference of the IEEE Industrial Electronics Society*, Chicago, USA, 2024.

[C2] A. Anwar, M. U. Hassan, **A. B. Mirza**, A. Muneeb and Fang Luo, "Design and Analysis of Differential Mode Active EMI Filter for WBG Devices-Based PFC Converters," *IECON 2024 – 50th Annual Conference of the IEEE Industrial Electronics Society*, Chicago, USA, 2024.

[C3] S. S. Vala, **A. B. Mirza** and F. Luo, "A TMR-based Integrated Current Sensing Solution for WBG Power Modules," *2024 IEEE Applied Power Electronics Conference and Exposition (APEC)*, Long Beach, CA, USA, 2024, pp. 2398-2402.

[C4] Y. Azadeh, **A. B. Mirza** and F. Luo, "Investigation of Cable Length Influence on EMI Spectrum in a WBG-Based Drive System," *2024 IEEE Applied Power Electronics Conference and Exposition (APEC)*, Long Beach, CA, USA, 2024, pp. 133-136.

[C5] Y. Azadeh, **A. B. Mirza** and F. Luo, "Investigation of Motor Winding Overvoltages in Integrated WBG-Based Motor Drive Systems," *2024 IEEE Applied Power Electronics Conference and Exposition (APEC)*, Long Beach, CA, USA, 2024, pp. 148-152.

[C6] **A. B. Mirza**, S. S. Vala, G. Bhansali, B. Narayanasamy and F. Luo, " Split Inductor Design Considerations for Split-Phase Three-Phase Inverter," *2023 IEEE Energy Conversion Congress and Exposition (ECCE)*, Nashville, TN, USA, 2023, pp. 1-6.

[C7] **A. B. Mirza**, Y. Xie, S. S. Vala and F. Luo, " Impact of PCB Parasitic Capacitance on Switching Transients in Split-Phase Inverter Utilizing TO-247 SiC Devices," *2023 IEEE Energy Conversion Congress and Exposition (ECCE)*, Nashville, TN, USA, 2023, pp. 1-6.

[C8] K. Choksi, S. S. Vala, **A. B. Mirza**, D. Singh and F. Luo, " Comprehensive Evaluation of Partial Discharge in WBG Drives Fed Motor Windings using DBSCAN Feature Extraction," *2023 IEEE Energy Conversion Congress and Exposition (ECCE)*, Nashville, TN, USA, 2023, pp. 1-7.

[C9] D. Singh, A. Zhou, A. Muneeb, **A. B. Mirza** and F. Luo, "Modeling and Performance Enhancement of Grid Tied Tidal Energy System with Fractional Order Integral Based Incremental Conductance," *2023 IEEE Energy Conversion Congress and Exposition (ECCE)*, Nashville, TN, USA, 2023, pp. 1-7.

[C10] **A. B. Mirza**, A. Muneeb, S. S. Vala and F. Luo, "Investigation of Common-Mode EMI in Three-Phase Split-Phase Inverter," *2023 IEEE Symposium on Electromagnetic Compatibility & Signal/Power Integrity (EMC+SIPI)*, Grand Rapids, MI, USA, 2023, pp. 522-528.

[C11] Y. Azadeh, **A. B. Mirza**, K. Choksi, X. Zhang, F. Luo and K. S. Haran, "dV/dt Impact on Turn-to-Turn Overvoltage Distribution in Motor Windings," *2023 IEEE Symposium on Electromagnetic Compatibility & Signal/Power Integrity (EMC+SIPI)*, Grand Rapids, MI, USA, 2023, pp. 579-584.

[C12] **A. B. Mirza** *et al*., "Hardware Design and Implementation of a 75 kVA 3-D Integrated Intelligent Power Stage," *2023 IEEE Applied Power Electronics Conference and Exposition (APEC)*, Orlando, FL, USA, 2023, pp. 977-983.

[C13] **A. B. Mirza**, X. Xu, A. I. Emon, F. Luo and S. Chen, "A Three-Face Utilized Heat Sink Design for 3-D Integrated 75 kVA Intelligent Power Stage (IPS)," *2022 International Technical Conference and Exhibition on Packaging and Integration of Electronic and Photonic Microsystems (InterPACK)*, 2022.

[C14] X. Xu, **A. B. Mirza**, L. Gao, F. Luo and S. Chen, "Topology Optimization of Heat Sink for 3d Integrated Power Converters," *2022 International Technical Conference and Exhibition on Packaging and Integration of Electronic and Photonic Microsystems (InterPACK)*, 2022.

[C15] Y. Azadeh, M. Ul-Hassan, **A. B. Mirza**, F. Luo, K. M. Radha and M. S. Chinthavali, "Demand Driven Energy Management for PIPO Auxiliary Power Supply Architecture," *2022 IEEE Energy Conversion Congress and Exposition (ECCE)*, Detroit, MI, USA, 2022, pp. 1-6.

[C16] S. S. Vala, K. Choksi, **A. B. Mirza** and F. Luo, "Exploring Interactions Between Reflected Wave and Partial Discharge in WBG Motor Drives," *2022 IEEE Energy Conversion Congress and Exposition (ECCE)*, Detroit, MI, USA, 2022, pp. 1-5.

[C17] **A. B. Mirza**, K. Choksi, S. S. Vala, K. M. Radha, M. S. Chinthavali and F. Luo, "Cognitive Insights into Metaheuristic Digital Twin based Health Monitoring of DC-DC Converters," *2022 24th European Conference on Power Electronics and Applications (EPE'22 ECCE Europe)*, Hanover, Germany, 2022, pp. 1-7.

[C18] R. Paul, A. Faruque, A. Hassan, A. Mantooth, S. S. Vala, **A. B. Mirza** and F. Luo, "A Heterogeneously Integrated Double-Sided Cooling Silicon Carbide Power Module," *2022 20th IEEE Interregional NEWCAS Conference (NEWCAS)*, Quebec City, QC, Canada, 2022, pp. 475-479.

[C19] S. S. Vala, **A. B. Mirza** and F. Luo, "A Review on Partial Discharge Phenomenon in Rotating Machines Operated Using WBG Motor Drives," *2022 IEEE Transportation Electrification Conference & Expo (ITEC)*, Anaheim, CA, USA, 2022, pp. 523-528.

[C20] **A. B. Mirza**, A. I. Emon, S. S. Vala and F. Luo, "A Comprehensive Analysis of Current Spikes in a Split-Phase Inverter," *2022 IEEE Applied Power Electronics Conference and Exposition (APEC)*, Houston, TX, USA, 2022, pp. 1580-1585.

[C21] H. M. Maheri, S. S. Vala, **A. B. Mirza**, E. Babaei and D. Vinnikov, "A Novel Extendable High Gain Step up DC-DC Converter," *2021 IEEE 62nd International Scientific Conference on Power and Electrical Engineering of Riga Technical University (RTUCON)*, Riga, Latvia, 2021, pp. 1-6.

[C22] A. I. Emon, M. U. Hassan, **A. B. Mirza**, Z. Yuan and F. Luo, "EMI Propagation Path Modeling of 3-Level T-type NPC Power Module with Stacked DBC Enabled EMI Shielding," *2021 IEEE Energy Conversion Congress and Exposition (ECCE)*, Vancouver, BC, Canada, 2021, pp. 5233-5239.

[C23] **A. B. Mirza**, A. I. Emon, S. S. Vala and F. Luo, "Noise Immune Cascaded Gate Driver Solution for Driving High Speed GaN Power Devices," *2021 IEEE Energy Conversion Congress and Exposition (ECCE)*, Vancouver, BC, Canada, 2021, pp. 5366-537.

[C24] **A. B. Mirza**, A. I. Emon, S. S. Vala and F. Luo, "An Integrated Magnetic Structure for Bi-Directional Two-Channel Interleaved Boost Converter with Coupled Inductor," *2021 IEEE Energy Conversion Congress and Exposition (ECCE)*, Vancouver, BC, Canada, 2021, pp. 5466-5470.

[C25] **A. B. Mirza**, Y. Azadeh, H. Peng and F. Luo, "An Isolated Voltage Injection Based Hybrid Circuit Breaker for MVDC Applications," *2021 IEEE Energy Conversion Congress and Exposition (ECCE)*, Vancouver, BC, Canada, 2021, pp. 608-612.

[C26] A. I. Emon, H. Carlton, J. Harris, A. Krone, Mustafeez-ul-Hassan, **A. B. Mirza**, Z. Yuan, D. Huitink and F. Luo, "A 650V/60A Gate Driver Integrated Wire-bondless Multichip GaN Module," *2021 IEEE 12th International Symposium on Power Electronics for Distributed Generation Systems (PEDG)*, Chicago, IL, USA, 2021, pp. 1-6.

[C27] A. I. Emon, H. Carlton, J. Harris, A. Krone, **A. B. Mirza**, Mustafeez-ul-Hassan, Z. Yuan, D. Huitink and F. Luo "Design and Optimization of 650V/60A Double-Sided Cooled Multichip GaN Module," *2021 IEEE Applied Power Electronics Conference and Exposition (APEC)*, Phoenix, AZ, USA, 2021, pp. 2313-2317.

PROFESSIONAL SERVICE

- **Reviewer**
  - IEEE Transactions on Power Electronics
  - IEEE Journal of Emerging and Selected Topics in Power Electronics
  - IEEE Transactions on Transportation Electrification
  - IEEE Transactions on Components, Packaging and Manufacturing Technology
  - IEEE Transactions on Electromagnetic Compatibility
  - IEEE Transactions on Industry Applications
  - IEEE Transactions on Industrial Electronics
  - IEEE Open Journal of Power Electronics
  - IEEE Applied Power Electronics Conference and Exposition (APEC)
  - IEEE Energy Conversion Congress and Exposition US (ECCE) and Asia (ECCE-Asia)
  - IEEE Transportation Electrification Conference and Exposition (ITEC)
  - IEEE International Symposium on Smart Electronic Systems
- **Webinars**
  - IEEE Power Electronics Society (PELS) TC3 webinar "High Fidelity Cable Impedance Modeling and Split-Phase Topology for Enhanced Reflected Wave Mitigation in Two-Level SiC Motor Drives" (Upcoming)

TECHNICAL SKILLS

Hardware/Equipment – Spellman HV power supplies, Tektronix MSO56 and MSO58 Oscilloscopes, Rigol DSA 815 Spectrum Analyzer, Bode-100 and Keysight ENA 5061B Network Analyzer, Com-Power Near Field Probes and LISN, Keysight EXA N9010A Signal Analyzer and EXA N9038A EMI Receiver

Software – Altium PCB Designer, ANSYS (Maxwell, Simplorer, Q3D, SIwave and HFSS), ORCAD PSpice, LTSpice, MATLAB Simulink, PLECS, Typhoon HIL, Code Composer Studio, Intel Quartus, Power World Simulator (PWS), LaTeX, LabView

Functional – Structural Programming, Object Oriented Programming, Meta-Heuristic Optimization Algorithms (Particle Swarm Optimization and Genetic Algorithm)

Programming – C, Embedded C, ARM Assembly, Verilog. MathScript, Python

Microcontrollers/FPGA – Texas Instrument C2000 series, Arduino, Intel Cyclone IV FPGAs

Communication Protocols – UART, SPI

PROFESSIONAL SOCIETIES

- Institute of Electrical and Electronics Engineers (IEEE) 2015 - Present
- IEEE Electromagnetic Compatibility Society 2023 - Present
- IEEE Industry Applications Society 2023 - Present
- IEEE Industrial Electronics Society 2023 - Present
- IEEE Power and Energy Society (PES) 2016 - Present
- IEEE Power Electronics Society (PELS) 2016 - Present
- Pakistan Engineering Council (PEC) 2018 - Present