

Dr. Vikram Kumar Saxena

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RESEARCH EXPERTISE: Power Electronics, GaN HEMT Modeling, Resonant Gate Driver Circuits, Electric Vehicle Charging, Smart Micro grids, Simulation using MATLAB, LTspice, PSIM.

SKILLS:

- Electrical system simulation (MATLAB, PSIM, Multisim, Proteus)
- Hardware prototyping (DSP STM32, DSPACE)
- Circuit design and testing
- Curriculum development and lab setup
- Team leadership and research supervision
- Research and analysis

COMPUTING SKILLS: MATLAB, STMCube IDE, Arduino IDE, Keil, Embedded C, PCB schematic/layout design, Ansys Electronic Desktop, COMSOL.

LANGUAGES: English (Fluent), Hindi (Fluent), Bengali (Proficient in speaking)

EDUCATION:

2026
9th Jan **National Institute of Technology Manipur, Imphal**
PhD in Electrical Engineering
CGPA: 8.2
Dissertation: **DESIGN, MODELLING AND DEVELOPMENT OF GATE DRIVER CIRCUITS FOR WBG DEVICES FOR GREEN ENERGY APPLICATION.**
Supervisor: Dr. Kundan Kumar & Dr. Benjamin A Shimray

2014 **National Institute of Technology Patna, Patna**
MTech in Electrical Engineering (Power System)
CGPA: 7.23
Supervisor: Dr. Jayanti Choudhary

2010 **Bengal Institute of Technology and Management, Bolpur Santiniketan**
Affiliated by MAKAUT Kolkata (Formerly known as WBUT Kolkata)
BTech in Electrical Engineering
CGPA: 7.7

2003 **Bhagalpur National College, Bhagalpur**
Intermediate of Science (I.Sc.)
55% (2nd Division)

2001 **C M S High School, Bhagalpur**
Matriculation
64% (1st Division)

RESEARCH Academic research in GaN-HEMT-based gate driver circuits, electric vehicle charging systems, power electronics simulation. Published in IEEE Transactions. Designed high-efficiency Class E resonant inverter with GaN-HEMT and novel gate driver topologies. Developed physics-based hybrid models incorporating nonlinear parasitic and electro thermal behavior. Contributed to LTspice/MATLAB co-simulation framework for compact and physics-based modeling.

EXPERIENCE: More than nine years as an Assistant Professor, with experience designing curriculum, developing new teaching tools, grading, overseeing labs, and Exam evaluator at the university level.

Presently	Assistant Professor, Swami Vivekananda University, Kolkata, December 2025 – to date.
2017-2021	Assistant Professor, Pailan College of Management and Technology, Kolkata, August 2017 – January 2022.
2012-2017	Assistant Professor, R V S College of Engineering and Technology, Jamshedpur, September 2012 – July 2017.
2017	HOD, Electrical and Electronics Engineering Department, RVSCET Jamshedpur: Jan 2017-July 2017.
AWARDS & ACHIEVEMENT	• Primary Evaluator, Toycathon 2021, Ministry of Education's Innovation Cell and AICTE • Student Travel Award in 2025 IEEE North-East India International Energy Conversion Conference and Exhibition (NE-IECCE 2025), Silchar, India, 4-6 July 2025. • Best Paper Presentation in 2024 IEEE 1st International Conference on Green Industrial Electronics and Sustainable Technologies (GUEST), held at NIT Manipur, Imphal, India, on 24th-26th October 2024. • Best Paper Award in 2025 IEEE 2nd International Conference on Green Industrial Electronics and Sustainable Technologies (GUEST), held at NIT Jamshedpur, India, on 11th -13th October 2025. • PhD Scholarship (GATE) • MTech Scholarship (GATE) • GATE qualified in 2010, 2011, 2012, 2020.
PROFESSIONAL ACTIVITIES	• Actively involved with my PhD supervisor in preparing UG and PG Curricula for the Electrical Engineering Department at NIT Manipur. • Actively involved in the staff recruitment process at Pailan College of Management and Technology, Kolkata, West Bengal, India. • Carried out Planning and installation of a new Electrical Machines Lab at Pailan College of Management and Technology, Kolkata, West Bengal, India. • Was actively involved in evaluating research proposals submitted to the EEE department at Pailan College of Management and Technology, Kolkata, West Bengal, India, and R V S College of Engineering and Technology, Jamshedpur, Jharkhand, India. • Prepared course materials and lab manuals for the Electrical Machines and Power Electronics Lab. • Worked for NBA Accreditation at R V S College of Engineering and Technology, Jamshedpur, Jharkhand, India. • Worked for NAAC Accreditation at Pailan College of Management and Technology, Kolkata, West Bengal, India.
LEADERSHIP	• Co-Chair, Organizing Committee for National and International IEEE conferences. • Chair, IEEE SB NIT Manipur-2023, 2024, 2025. • Executive Committee Member of IEEE Transportation Electrification Council-2024-25. • Member of the Technical Program Core Committee, 2025 IEEE International Conference on Power, Electrical, Electronics and Industrial Applications (PEEIACON), jointly organized by IEEE Bangladesh Section (IEEE BDS) and IEEE Industry Applications Society (IAS) Bangladesh Chapter. • Speaker as a Young Professional in the 2025 IEEE 2nd International Conference on Green Industrial Electronics and Sustainable Technologies, to be organized by NIT Jamshedpur.
PROFESSIONAL ASSOCIATIONS	• IEEE Graduate Student Member • Lifetime Associate Member of the Institution of Engineers (India). • Member of IEEE IAS, IES, IEEE Council on RFID, IEEE Council on Superconductivity, IEEE Nanotechnology Council, IEEE Sensors Council, IEEE

SIGHT, IEEE Systems Council, IEEE Transportation Electrification Council, and IEEE Young Professionals.

- Member IEEE EAB TryEngg STEM Grant Reviewers, IEEE Member EAB EPICS Grant Reviewers, IEEE Member EAB STEM Outreach.

PUBLICATIONS
SCI/SCIE Indexed
Referred Journals

- **V. K. Saxena**, K. Kumar, K. T. Lulbadda and S. Williamson, "A Comprehensive Analysis of GaN-HEMT-Based Class E Resonant Inverter Using Modified Resonant Gate Driver Circuit," in IEEE Transactions on Industry Applications, vol. 60, no. 5, pp. 7098-7110, Sept.-Oct. 2024, doi: **10.1109/TIA.2024.3413045**.
- **V. Kumar Saxena**, K. Kumar and B. A. Shimray, "Efficiency Enhancement and EMI Mitigation in GaN-HEMTs Using a Single-Switch Resonant Gate Driver Circuit," in IEEE Transactions on Consumer Electronics, vol. 71, no. 4, pp. 10196-10208, Nov. 2025, doi: **10.1109/TCE.2025.3597551**.

**International/
National
Conferences**

- **V. K. Saxena**, K. Kumar, and Benjamin A Shimray, " High-Efficiency GaN HEMT Gate Driver Using a Resonant Current Source with Intrinsic Negative Turn-Off Capability," in IEEE Transactions on Intelligent Transportation Systems (**Under review**).
- K. Kumar, **V. Kumar Saxena**, B. A. Shimray, Vivek Bhatt and S. Kr. Dwivedi, "State of Charge and State of Energy Estimation in Renewable Microgrids using a Graphical Neural Network Approach," IECON 2026 – 52nd Annual Conference of the IEEE Industrial Electronics Society, Doha, Qatar, from 18 to 21 October 2026. (**Accepted**).
- **V. K. Saxena**, K. Kumar, and Benjamin A Shimray, "A Generalized State-Space Averaging Approach for Non-Ideal Modelling of Class-E Resonant Inverters," IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES 2026), will be organized from 16th to 19th December 2026 at IIT Guwahati, Assam, India. (**Accepted**)
- Niranjan Kumar, Kundan Kumar, **V. K. Saxena**, and Nitesh Kumar, "A Comparative Analysis of Resistive and Energy-Efficient Resonant Gate Drivers for High-Frequency Power Converters" 10th IEEE India International Conference On Power Electronics, in collaboration with National Institute of Technology Uttarakhand, INDIA & Maulana Azad National Institute of Technology Bhopal, INDIA 13–15 December 2026. (**Accepted**)
- R. R. Parvej, Pallav Kumar Ghosh, and **V. K. Saxena**, "Analysis of an Isolated Multi-Output Flyback Converter for Low-Power LED Lighting Applications," 2026 IEEE SILCHAR SUBSECTION CONFERENCE (Silcon 2026), will be organized from 18th to 20th December 2026 at NIT Manipur, India. (**Accepted**)
- **V. K. Saxena**, K. Kumar, Benjamin A Shimray and S. K. Dwivedi, "AI-Powered Adaptive Battery Model for Fast Charging Scheduling Incorporating SoC-Dependent Dynamics and Degradation Forecasting," 2025 IEEE 4th International Conference on Smart Technologies for Power, Energy, and Control (STPEC 2025), doi: **10.1109/STPEC66316.2025.11490766**.
- **V. K. Saxena**, K. Kumar, B. A. Shimray and S. K. Dwivedi, "Adaptive SoC-Dependent Fast Charging Optimisation with Degradation-Aware Scheduling in DC Microgrid Architecture for Electric Vehicles," 2025 IEEE 12th Uttar Pradesh Section International Conference on Electrical, Electronics and Computer Engineering (UPCON), Varanasi, India, 2025, pp. 1-6, doi: **10.1109/UPCON66414.2025.11453770**.
- **V. K. Saxena**, K. Kumar and B. A. Shimray, "Hybrid Simulation and Modelling Framework for GaN HEMTs Integrating Compact Models and Electrothermal Analysis in LTspice and MATLAB," 2025 IEEE 2nd International Conference on Green Industrial Electronics and Sustainable Technologies (GIEST), Jamshedpur, India, 2025, pp. 1-6, doi: **10.1109/GIEST66547.2025.11387332**.

- **V. K. Saxena**, K. Kumar and B. A. Shimray, "Physics-Integrated Hybrid Modelling of GaN HEMTs Using PFNN and RLC-Based Circuit CoSimulation for Accurate Switching Dynamics," 2025 IEEE 2nd International Conference on Green Industrial Electronics and Sustainable Technologies (GUEST), Jamshedpur, India, 2025, pp. 1-6, doi: **10.1109/GUEST66547.2025.11387288**. (**Best Paper Award**).
- K. Kumar, **V. Kumar Saxena**, B. A. Shimray, V. Mali and S. Kr. Dwivedi, "Physics-Based Hybrid Analytical Empirical Model for GaN-HEMT Incorporating Dynamic Drift Velocity, Nonlinear Parasitics, and Thermal Feedback," IECON 2025 – 51st Annual Conference of the IEEE Industrial Electronics Society, Madrid, Spain, 2025, pp. 1-6, doi: **10.1109/IECON58223.2025.11221236**.
- **V. K. Saxena** and K. Kumar, "Enhanced Electric Vehicle Charging Using a GaN-HEMT-Based Buck Converter with a Resonant Gate Driver for Closed-Loop Operation," 2025 IEEE North-East India International Energy Conversion Conference and Exhibition (NE-IECCE), Silchar, India, 2025, pp. 1-6, doi: **10.1109/NE-IECCE64154.2025.11182948**.
- Naorem Rudra, S. N. Meitei, and **V. K. Saxena**, "Speed and Torque Control Analysis of PMSM Motors Using a Fuzzy Logic-Based PID Controller," 2025 IEEE North-East India International Energy Conversion Conference and Exhibition (NE-IECCE), Silchar, India, 2025, pp. 1-6, doi: **10.1109/NE-IECCE64154.2025.11182725**.
- **V. K. Saxena**, K. Kumar, V. Mali and S. K. Dwivedi, "Closed-Loop Control of GaN-HEMT-Based Buck Converter Using Modified RGDC," 2024 IEEE 3rd Industrial Electronics Society Annual On-Line Conference (ONCON), Beijing, China, 2024, pp. 1-5, doi: **10.1109/ONCON62778.2024.10931748**.
- **V. K. Saxena**, R. Daniel, K. Kumar, R. R. Kumar, S. Banerjee and S. Garlapati, "Innovative Glove Design for Enhanced Robotic Hand Control using PWM Techniques," 2024 IEEE 1st International Conference on Green Industrial Electronics and Sustainable Technologies (GUEST), Imphal, India, 2024, pp. 1-5, doi: **10.1109/GUEST62955.2024.10959879**. (**Best Paper Presentation Award**)
- **V. K. Saxena** and K. Kumar, "A Novel Multi-Resonant Current Source Gate Driver Circuit for GaN-HEMT," 2024 IEEE 4th International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2024, pp. 1-6, doi: **10.1109/SEFET61574.2024.10718004**.
- K. Kumar and **V. K. Saxena**, "LTspice Simulation Analysis for Loss Estimation of GaN MOSFET-based Class E Resonant Inverter," 2022 IEEE Global Conference on Computing, Power and Communication Technologies (GlobConPT), New Delhi, India, 2022, pp. 1-6, doi: **10.1109/GlobConPT57482.2022.9938227**.

Book Chapter

- N. Maisnam, **V.K. Saxena**, K. Kumar, and S. Kant, "Effect of misalignment issues for different coil structures in dynamic wireless charging system," Electric Vehicle Propulsion Drives and Charging Systems, CRC Press, 1st Edition, eBook ISBN 9781003481065, June 2024, pp. 168-187, doi.org/**10.1201/9781003481065**.
- **V. K. Saxena** and K. Kumar, "Comparative Analysis of Gate Driver Circuits for GaN-HEMT based Class E Resonant Inverter," Recent Advances in Electrical and Electronic Engineering: Selected Proceedings of ICSTE 2023: 1071 (Lecture Notes in Electrical Engineering), pp. 21-29. doi: **10.1007/978-981-99-4713-3_2**.
- **Editor of Book Chapter** "Advances in Data Science and Computing Technology: Methodology and Applications," Apple Academic Press (Exclusive co-publishing with CRC Press, Taylor & Francis Group), 1st Edition, eBook ISBN 9781003277071, Nov 2022, <https://doi.org/10.1201/9781003277071>.
- Arrik Khanna, Pushpanjali Singh Bisht, and **Vikram Kumar Saxena**, "Active and Reactive Power Control in Variable Wind Turbine Using Simultaneous Working of

Statcom and Pitch Control," Advances in Data Science and Computing Technology, Apple Academic Press, 1st Edition, eBook ISBN 9781003277071, Nov 2022, pp. 253-271, doi.org/10.1201/9781003277071.

Patent

- K. Kumar, **V K Saxena**, Vima Mali and Anil Birru, "Dynamic Wireless Charging System for Electric Vehicles with High-Frequency Inverter Driven by Modified Resonant Gate Driver Circuit," Patent No-202431051825, India, 12/07/2024 (**Published**).

REVIEWER

- Peer Reviewer
 - **IEEE Access**
 - **EPICS IEEE**
 - **IEEE STEM**
 - **e-Prime – Advances in Electrical Engineering, Electronics and Energy, Elsevier Journal**
 - **International Journal of Electrical Power and Energy Systems, Elsevier Journal**
 - **Computers and Electrical Engineering, Elsevier Journal**
 - **International Journal of Circuit Theory and Applications, Wiley Publication**
- ❖ Reviewer in 25+ International Conferences, some are listed below:
 - 7th International Conference on Physics, Mathematics and Statistics (ICPMS2024), Yichang, China
 - 2025 4th IEEE International Conference on Smart Technologies for Power, Energy, and Control (STPEC)
 - 2025 2nd IEEE International Conference on Green Industrial Electronics and Sustainable Technologies (GUEST-2025), Jamshedpur, India
 - 2024 IEEE International Conference on Power Electronics, Drives and Energy Systems, Mangalore, India.
 - 2024 1st IEEE International Conference on Green Industrial Electronics and Sustainable Technologies (GUEST-2024), Imphal, India.
 - 2024 IEEE 4th International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India.
 - IEEE International Conference on Smart Power Control and Renewable Energy 2024, Rourkela, India
 - 2024 IEEE International Conference on Power, Electrical, Electronics and Industrial Applications, Rajshahi, Bangladesh
 - International Conference on Power Systems 2023, Cox's Bazar, Bangladesh.
 - 2023 IEEE 2nd International Conference on Industrial Electronics: Developments & Applications (ICIDeA), Imphal, India.
 - 2022 IEEE GLOBAL CONFERENCE ON COMPUTING, POWER AND COMMUNICATION TECHNOLOGIES (GlobConPT), Delhi, India.

WORKSHOP/ FDP

- Coordinator of 2-days Workshop on "An Introduction to the Development of Microcontroller-based System using ARDUINO UNO" at Pailan College of Management and Technology in association with the Department of Electrical Engineering Jadavpur University, on 2nd -3rd November 2018.
- FDP on "Recent Trends of Control Systems in Power Electronics Converter" from 3rd to 7th January 2022 at NIT Manipur by AICTE Training and Learning (ATAL) Academy.
- FDP on "Power Electronics application in Machine Drives and Power system" from 01/12/2020 to 05/12/2020 at NIT Mizoram by AICTE Training and Learning (ATAL) Academy.
- Participated in the 35th Indian Engineering Congress from 18th -20th December 2020,

organized by the Institution of Engineers (India).

- FDP on “Emerging Trends and Developments in Electric Vehicles” from 25/10/2021 to 29/10/2021 at NIT Manipur by AICTE Training and Learning (ATAL) Academy.
- FDP on “Management of Intellectual Property Uncertainty in Designing and Manufacturing for Electric Vehicle Systems” from 21/02/2022 to 25/02/2022 at NIT Manipur by AICTE Training and Learning (ATAL) Academy.
- Participated in “2-Day Awareness-cum-Workshop Programme on Electric Vehicles, Charging Infrastructure and Renewable Hybrid Energy in North East India” jointly organized by CSIT-Indian Institute of Petroleum (CSIR-IIP), Dehradun and CSIR-North East Institute of Science and Technology (CSIR-NEIST) Branch Lab, Imphal in association with the Transport Department, Govt. of Manipur, from 9th -10th November 2022.
- Participated in and attended SERB-sponsored One Week Karyashala (High-End Workshop) on “Blockchain Technology Applications in Electrical Energy System” held from 13th to 19th March 2024 at NIT Agartala.

I hereby declare that the above-mentioned statements are correct to the best of my knowledge and belief.

Place: **Kolkata**



Vikram Kumar Saxena