Ashok Kumar, PhD,
Assistant Professor,
Department of Electrical Engg., IIT (ISM) Dhanbad.
Email Id: krashok@iitism.ac.in, 6009krashok@gmail.com

Education:

Indian Institute of Technology, Kanpur Doctor of Philosophy – Power Engineering Thesis title: Converter Topologies for Low Power Single and Two Stage Buck-Boost Inverter Systems. CGPA (course work): 9.41/10	2020

Indian Institute of Technology, Roorkee Master of Technology – Electrical Drives and Power Electronics Thesis title: Digital voltage and frequency controller for self-excited induction generator. CGPA: 8.52/10	2012

National Institute of Technology, Raipur Bachelor of Technology – Electrical Engineering CGPA: 8.09/10	2010

Work Experience:

S. No.	Organization	Designation	Pay Scale (AGP)	From (Date)	To (Date)
1.	IIT (ISM) Dhanbad	Assistant Professor	Pay level 12 AGP 8000	20/01/2024	Till date
2.	IIT (ISM) Dhanbad	Assistant Professor	Pay level 11 AGP 7000	20/01/2022	19/01/2024
1.	NIT Tiruchirappalli	Assistant Professor	Pay level 10, AGP 6000	04/06/2020	12/01/2022

Research funding:

S. No.	Role	Project No	Title of the Project	Amount	Year of Sanction	Funding Agency
1	Co-PI	FIST Project No. DST(FIST)/2024-2025/1114/EE	Power Electronics Research Facilities for Modernization of Mining Infrastructure	Rs. 203 lakhs	2023	DST
2	Co-PI	SCOE 0007 I	Center of Excellence ReNew Foundation	Rs. 100 lakhs	2024	ReNew Foundation
3	PI	FRS(201)/2023-2024/EE	Design and Development of a New Reduced Switch Count Micro-inverter-based Battery-integrated Solar Rooftop Power Generation System’	Rs. 15 lakhs	2023	IIT (ISM) Dhanbad

Ph. D. Supervision (Completed/Ongoing):

S. No.	Name of Candidate	Registration No. with date	Status of work done	Sole or Joint	In the case of joint guide, the Name of the Principal guide & Co-guide
1	Sanjay Kumar Sena (Regular)	22DR0242	Research proposal seminar completed.	Sole	---
2	Chandan Verma (Regular)	22DR0289	Research proposal seminar completed.	Sole	---
3	Md Akram Neyazi (Regular)	24DR0231	Coursework going on	Sole	---
4	Gulfshan (Part-time)	24DP0091	Coursework going on	Sole	---

Post Graduate Projects supervision:

Sl No.	Completed	Ongoing	Guide/Co-Guide
1	2 (22MT0432, 22MT0171)	3 (23MT0241 23MT0219)	Guide

Journal Publications

Sl No.	Authors	Title of paper	Journal	Volume/ year/DOI	Page	Indexed in (SCI/SSCI/SCIE/SCOPUS etc.) / Acceptance Date
1	**Ashok Kumar**, Parthasarathi Sensarma	Ripple-Free Input Current High Voltage Gain DC-DC Converters with Coupled Inductors	IEEE Transactions on Power Electronics	Volume: 34, Issue: 4	3418 - 3428	2019
2	**Ashok Kumar**, Parthasarathi Sensarma	New Switching Strategy for Single-Mode Operation of a Single-Stage Buck-Boost Inverter	IEEE Transactions on Power Electronics	Volume: 33, Issue: 7	5927 - 5936	2018
3	Utsab Kundu, Bhavit Pant, Supratik Sikder, **Ashok Kumar**, Parthasarathi Sensarma	Frequency Domain Analysis and Optimal Design of Isolated Bidirectional Series Resonant Converter	IEEE Transactions on Industry Applications	Volume: 54, Issue: 1	356 - 366	2018
4	**Ashok Kumar**, Parthasarathi Sensarma	A Four-Switch Single-Stage, Single-Phase Buck-Boost Inverter	IEEE Transactions on Power Electronics	Volume: 32, Issue: 7	5282 - 5292	2017
5	Narang, H.K., **Ashok Kumar**, M.M.	Modelling for SAW Square Butt Joints by Using ANFIS to	Advanced Materials Research	585	455–59	2012

	Mahapatra, and P.K. Jha.	Predict the Weldment Characteristics of Joint	ISSN web 1662-8985			

Patents:

S. No.	Patent Title	Name of Applicant(s)	Patent/ Application No.	Award/ Publication/ Filing Date	Agency/Country	Status
1	Photovoltaic Based Single DC Input Hybrid Output Converter	C. Verma, S. K. Sena and **A. Kumar**	202431100461	Dec 27, 2024.	IIT ISM Dhanbad/ India	Published
2	A Single-Stage Single-Phase Non-isolated Microinverter for Residential Rooftop Photovoltaic Applications	S. K. Sena and **A. Kumar**	202431087391	Nov 22, 2024.	IIT ISM Dhanbad/ India	Published
3	A Single-Stage Single-Phase Non-Isolated Microinverter	S. K. Sena and **A. Kumar**	202531007740	Feb 07, 2025.	IIT ISM Dhanbad/ India	Filed
4	Hybrid Input Electric Vehicle Charging System	C. Verma, S. K. Sena and **A. Kumar**	202531003225	Jan 24, 2025.	IIT ISM Dhanbad/ India	Published
5	Single-stage buck-boost photovoltaic micro-inverter	**Ashok Kumar**, Parthasarathi Sensarma	376931	Sep 10, 2021	IIT Kanpur/ India	Granted
6	Single-stage transformer-less photovoltaic inverter	**Ashok Kumar**, Parthasarathi Sensarma	355651	Jan 11, 2021	IIT Kanpur/ India	Granted

Conferences Publications

1. Vinayak Ajinath Mastud**, Ashok Kumar,** Sanjay Kumar Sena, "Step-by-Step Reliability Analysis of Wireless Battery Charger for Electric Vehicles using the Markov Process," IEEE SETCOM 2025, Gandhinagar, Gujrat, India, 2024.
2. **A. Kumar** and S. K. Sena, "Small Signal Modelling of Open Loop Single Mode Inverter Using Circuit Averaging Technique," 2024 International Conference on Emerging Frontiers in Electrical and Electronic Technologies (ICEFEET), Patna, India, 2024.
3. **A. Kumar** and P. Sensarma, "Review of Front-end DC-DC Boost Converters in Two-stage Micro-inverters",
4. IEEE PEDES, Jaipur, Dec, 2020.
5. **A. Kumar** and P. Sensarma, "Single Active Switch High Voltage Gain DC-DC Converter with Reduced Devices Stress", IEEE PEDES, Jaipur, Dec, 2020.
6. **A. Kumar** and P. Sensarma, "Operating modes based review of single-stage buck-boost inverters, IEEE IECON, Lisbon, Portugal, 2019.
7. **A. Kumar,** Kanika Bathra and P. Sensarma, "A Cascaded Buck-Flyback Structure for High Voltage

Step Down Applications," IEEE IECON, Lisbon, Portugal, 2019.

8. **A. Kumar** and P. Sensarma, "Inner Loop Stability of Peak Current Controlled Cuk and SEPIC Converters," IEEE PEDES, Chennai, India, 2018.
9. **A. Kumar** and P. Sensarma, "Derivation of Single-Stage Single-Phase Fourth Order Buck-boost Inverters," IEEE PEDES, Chennai, India, 2018.
10. **A. Kumar** and P. Sensarma, "Two High Voltage Gain Non-isolated DC-DC Converters with Ripple Free Input Current," IEEE PEDES, Chennai, India, 2018.
11. **A. Kumar** and P. Sensarma, "CCM-DCM Operation of a High Voltage Gain Boost-Flyback Derived Converter," IEEE PEDES, Chennai, India, 2018.
12. **A. Kumar**, R. Peri, U. Kundu and P. Sensarma, "A high voltage gain current fed non-isolated dc-dc converter," IEEE PEDES, Trivandrum, India, 2016, pp. 1-6.
13. **A. Kumar**, R. Peri, and P. Sensarma, "Analysis and design of a current fed non-isolated buck-boost DC-DC converter," IEEE ECCE, Milwaukee, WI, 2016, pp. 1-8.
14. **A. Kumar**, V. Gautam, and P. Sensarma, "A SEPIC derived single-stage buck-boost inverter for photovoltaic applications," IEEE ICIT, Busan, 2014, pp. 403-408.
15. V. Gautam, **A. Kumar,** and P. Sensarma, "A novel single-stage, transformerless PV inverter," IEEE ICIT, Busan, 2014, pp.907-912.
16. U. Kundu, S. Sikder, **A. Kumar** and P. Sensarma, "Frequency domain analysis and design of isolated bidirectional series resonant Dc-dc converter," IEEE PEDES, Trivandrum, 2016, pp. 1-6.

Book Chapter:

- Ashok Kumar, Converter Topologies for Grid-Integration of Renewable Power Sources, Power Electronics for Next-Generation Drives and Energy Systems: Volume 2: Clean Generation and Power Grids, UK: IET, 2023. (In Press) ISBN: 978-1-83953-469-0

Awards/ Acheivment:

- Best Paper Award for the paper: A. Kumar and S. K. Sena, "Small Signal Modelling of Open Loop Single Mode Inverter Using Circuit Averaging Technique," 2024 International Conference on Emerging Frontiers in Electrical and Electronic Technologies (ICEFEET), Patna, India, 2024.
- Three times attained a General Impression About Teacher (GIAT) score of more than nine.
- Guest Editor, Energies: Advances in Application of Power Electronics to Utility Systems

Details of work/contribution towards Lab Development / Students Welfare

- **Contribution towards Lab Development:**
  - In charge of UG Power Electronics Laboratory
    - Initiated procurement of Magnetic core cutting machine, High bandwidth differential voltage probe, DC power supply, Function Generators and Microcontroller board of total worth of 12.5 lakhs
  - Procured Advanced SMD soldering machine worth 5 lakhs for PG Power Electronics Laboratory
- **Contribution towards Student Welfare:**
  - New Course Developed: EEC522- Electromagnetic Compatibility of Power Converters

Participation in National/International Seminar Outreach:

- Delivered a session on "Role of Renewable Energy in Mining", in "Refresher Training Program for CIL Executives" from 16th to 29th December 2024 at IIT (ISM) Dhanbad.

- Invited speaker at a five-day online short-term course on “Emerging Trends in Electric Vehicles (EVs) and Renewables (ETER 2022)”, organized by the Department of Electrical Engineering, Sardar Vallabhbhai National Institute of Technology, Surat, from 12th to 16th December 2022
- Delivered expert talk on “Multi-mode buck-boost inverters for PV applications” organized by the Joint IEEE Chapter of IES/IAS/PELS Society of IEEE Gujarat Section, on 17th October 2022.
- Invited speaker at a five-day online short-term course on "Wide Band Gap Devices Enabled Power Converters – Opportunities and Challenges" organized by the Department of Electrical and Electronics Engineering, National Institute of Technology, Puducherry, from 21 - 25 September 2022.
- Participated in a two-day Capsule Course on the National Electrical Code of India 2023 from 05 -06 July 2023 at the National Institute of Training for Standardization (NITS), Noida

Administrative duties/activities:

Dept. Level:

- Department I-Stem representative, 2022-24
- Department BIS coordinator
- UG Power Electronics Lab Incharge
- Department DUGC Committee member, 2022-24

Institute Level

- Chief warden, 2024-till now
- Warden Amber Hostel, 2022-24
- Joint Seat Allocation Authority Counselling Officer, 2023
- Srijan-2025 Treasurer
- Yuva Sangam Phase V - Coordinator
- National Wellbeing Conclave Hyderabad - Member
- Successfully cleared Malaviya Teacher Training Program

Technical Paper Reviewer

- IEEE Transactions on Industrial Electronics
- IEEE Transactions on Power Electronics
- IEEE Journal of Emerging and Selected Topics in Power Electronics
- IEEE Transactions on Transportation Electrification
- IEEE IAS Publications
- IET Power Electronics

Professional Affiliations

- MTEEE (Member of Institute of Electrical & Electronics Engineers: 92878175)

Current Research Interests

- Power electronic converters and control for renewable energy-based systems
- Electric vehicle technology
- Wireless power transfer
- Resonant converters
- WBG semiconductor devices-based converters
- Renewable energy-powered DC microgrid.
- Multi-port converters for battery charging applications
- Reliability analysis for Power Converters

Personal Details

- Place of Birth: Bhilai, Chhattisgarh
- Nationality: Indian
- Language Known: English, Hindi
- Marital Status: Single
- Hobbies: Cricket, Bodybuilding, Yoga, Cooking.
- Passport Number: V0116790

I hereby declare that the information furnished above is true to my knowledge.

Dated/Place: 11th March 2025 / Dhanbad, Jharkhand

Dr. Ashok Kumar