

Dr. Avik Bhattacharya

Institution

Associate Professor

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Residence

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Fields of Specialization: Machine Drive and Power Electronics, Renewable Energy.

Research Interests

- DC microgrid, source disturbance in DC microgrid and Stability
- Electric vehicle, power electronics
- Flexible AC Transmission System, Shunt Active Power Filter/UPQC
- Advance Electric Drive, investigation on multilevel inverter and its control
- Renewable energy, Application of SST in WECS
- Renewable Energy, Solar inverter topology

Educational Qualifications

Degree/Program	Institution/ University	Year	Class /Marks
PhD Electrical Engineering Power quality	Indian Institute of Technology Kharagpur (IITKGP), India	2010	1 st
Master of Engineering Machine Drive & Power Electronics	Indian Institute of Technology Kharagpur (IITKGP), India	2005	1 st
Bachelor of Engineering Electrical Engineering	Sikkim Manipal Institute of Technology	2001	1 st
Class XII	WBCHSE, India	1997	1 st
Class X	WBBSE, India	1995	1 st

Peer Reviewed Conference Proceedings:

SI No.	Role the of Faculty	Details of Conference	Venue	Date
	After Joining IIT Roorkee			
	Author	Rubell Sen Goopta, Punam Bhattacharjee, Shubhajit Pal, and Avik Bhattacharya Single Phase 15 Level CCS-MLI for PV Power Generation, IEEE 5th International Conference on Sustainable Energy and Future Electric Transportation (SEFET 2025), 9-12 July, MNIT Jaipur, Rajasthan, India. (Accepted for Presentation)	Jaipur, Rajasthan, India	July 9-12, 2025
	Author	A. Dattaroy and A. Bhattacharya, "A clan of nine novel non-isolated multi-input DC-DC converters possessing multi-output catering using a wide voltage conversion ratio," <i>2025 IEEE 5th International Conference on Sustainable Energy and Future Electric Transportation (SEFET)</i> , Jaipur, India, 2025, pp. 1-6, doi: 10.1109/SEFET65155.2025.11255408	Jaipur, Rajasthan, India	July 9-12, 2025
	Author	R. Sarker, S. Pal and A. Bhattacharya, "Harmonic Optimization in a Nine-Level Cascaded H-Bridge Inverter: Leveraging Support Vector Machine Algorithm with LSPWM Technique," <i>2024 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES)</i> , Mangalore, India, 2024, pp. 1-6, doi: 10.1109/PEDES61459.2024.10961746.	NITK Surathkal, India	December 18-21, 2024
	Author	S. Pal and A. Bhattacharya, "Design and Control of a Novel Grid-tied Fast Charging Architecture for EV using PFC Interleaved Boost Converter," <i>2023 IEEE International Conference on Power Electronics, Smart Grid, and Renewable Energy (PESGRE)</i> , Trivandrum, India, 2023, pp. 1-6, doi: 10.1109/PESGRE58662.2023.10404651.	Kerala, India	December 17-20, 2023
	[Best Paper Award]	Pal, S., Bhattacharya, A. (2024). Grid-Tied Completely Soft-Switched Isolated DC/DC Converter Architecture Using Charge Management Method for Fast EV Charging Station. In: Gupta, O.H., Kumar Samal, S., Mahanty, R., Singh, B., Colak, I. (eds) Recent Advances in Power Electronics and Drives. EPREC 2024. Lecture Notes in Electrical Engineering, vol 1240. Springer, Singapore. https://doi.org/10.1007/978-981-97-6091-6_21	NIT Jamshedpur, India	May 24-26, 2024

		<p>S. Pal, R. Sarker and A. Bhattacharya, "Artificial Intelligence-Driven Inductor Current Prediction in HD-SPWM-Controlled 3-Level DAB Converter for Fast EV Charging Application," 2024 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Mangalore, India, 2024, pp. 1-6, doi: 10.1109/PEDES61459.2024.10961710.</p> <p>S. Pal, R. Sarker and A. Bhattacharya, "Artificial Intelligence-Enabled Intelligent Monitoring for Anomaly Detection in Inductor Current of PSFB Converter for Fast EV Charging Application," 2024 IEEE 7th International Conference on Condition Assessment Techniques in Electrical Systems (CATCON), Kolkata, India, 2024, pp. 260-265,doi: 10.1109/CATCON60527.2024.10831055.</p> <p>S. Pal, R. Sarker and A. Bhattacharya, "Implementation of High Definition SPWM Technique in a Bidirectional 3-Level DAB Converter for Fast EV Charging Applications,"2024 IEEE 4th International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2024, pp. 1-6, doi: 10.1109/SEFET61574.2024.10718039.</p> <p>S. Pal and A. Bhattacharya, "Performance Evaluation of Different Optimization Techniques for SoC Estimation in EV Battery Management System," 2024 IEEE 1st International Conference on Green Industrial Electronics and Sustainable Technologies (GIEST), Imphal, India, 2024, pp. 1-6, doi: 10.1109/GIEST62955.2024.10959827.</p>	<p>NITK Surathkal, India</p> <p>Jadavpur University, Kolkata,India</p> <p>Hyderabad, India</p> <p>NIT Manipur, India</p>	<p>December 18-21, 2024</p> <p>November 22-24, 2024</p> <p>July31-August 3, 2024</p> <p>October 25-26, 2024</p>
	[Best Paper Award]			
Author		<p>A. Dattaroy and A. Bhattacharya, "A Novel Six-Switch Two-Output Port Isolated DC-DC Converter Acting as a DC Transformer for Battery Voltage Step-Up and Battery-to-PV Changeover Applications," 2024 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Mangalore, India, 2024, pp. 1-6, doi: 10.1109/PEDES61459.2024.10961022.</p>	<p>NITK Surathkal, India</p>	<p>December 18-21, 2024</p>

	Author	A. Dattaroy and A. Bhattacharya, "A Novel Three-Output Port Isolated DC-DC Converter with Four Switches Providing High Gain Quadratic Non-Inverting Buck-Boost or Derived Boost Characteristics Along with Continuous Input Battery Current Operation," <i>2024 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES)</i> , Mangalore, India, 2024, pp. 1-6, doi: 10.1109/PEDES61459.2024.10961088.	NITK Surathkal, India	December 18-21, 2024
	Author	A. Dattaroy and A. Bhattacharya, "A Novel Six-Switch Isolated DC-DC Converter with an Isolated Port Providing DC Transformer Gain and Two Non-Isolated Ports Serving Reciprocal Non-Inverting Buck-Boost Voltage Gain for EV Applications," <i>2024 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES)</i> , Mangalore, India, 2024, pp. 1-6, doi: 10.1109/PEDES61459.2024.10960933.	NITK Surathkal, India	December 18-21, 2024
	Author	A. Dattaroy and A. Bhattacharya, "A Novel Six-Switch Three-Output DC-DC Converter with Isolated Buck Characteristics and its Derivation from a Novel Four-Switch Two-Output Non-Isolated DC-DC Converter with Modified Boost and Complimentary Buck Operation," <i>2024 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES)</i> , Mangalore, India, 2024, pp. 1-6, doi: 10.1109/PEDES61459.2024.10961148.	NITK Surathkal, India	December 18-21, 2024
	Author	A. Dattaroy and A. Bhattacharya, "A list of three novel dissimilar voltage multi-input isolated high gain DC-DC converters supplying multiple outputs with widely varying characteristics," <i>2024 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES)</i> , Mangalore, India, 2024, pp. 1-6, doi: 10.1109/PEDES61459.2024.10961030.	NITK Surathkal, India	December 18-21, 2024
	Author	A. Dattaroy and A. Bhattacharya, "An Aggregate of Novel Non-Isolated Four-Switch DCDC Converters With a Wide Voltage Conversion Ratio," <i>2024 IEEE 4th International Conference on Sustainable Energy and Future Electric Transportation (SEFET)</i> , Hyderabad, India, 2024, pp. 1-6, doi: 10.1109/SEFET61574.2024.10718176.	Hyderabad, India	July 31-August 03, 2024
	Author	A. Dattaroy and A. Bhattacharya, "A Novel Four-Switch Non-Isolated DC-DC Converter with Inverted Buck and Non-Inverted	Hyderabad, India	July 31-Aug

		Buck-Boost Capability for Electric Vehicle Drivetrain Applications," 2024 IEEE 4th International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2024, pp. 1-6, doi: 10.1109/SEFET61574.2024.10718220.		August 03, 2024
	Author	A. Dattaroy and A. Bhattacharya, "A Novel Six-Switch Isolated DC-DC Converter with One Non-Isolated Step-Down Port and One Output Port with an Isolated ISOP Alternate and Interleaved HFT Catering for Electric Vehicle Applications," 2024 IEEE 4th International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2024, pp. 1-6, doi: 10.1109/SEFET61574.2024.10718044.	Hyderabad, India	July 31-August 03, 2024
	Author	A. Dattaroy and A. Bhattacharya, "A Novel Four-Switch DC-DC Converter Using Stacked Non-Isolated Boost and Switched Flyback Converters For High Battery Current Application," 2024 IEEE 4th International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2024, pp. 01-06, doi: 10.1109/SEFET61574.2024.10718008.	Hyderabad, India	July 31-August 03, 2024
	Author	A. Dattaroy and A. Bhattacharya, "A Cluster of Novel Non-Isolated DC-DC Converters with Four Switches Providing Extensive Variation in Voltage Conversion," 2024 IEEE 4th International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2024, pp. 1-6, doi: 10.1109/SEFET61574.2024.10718145.	Hyderabad, India	July 31-August 03, 2024
	Author	A. Dattaroy and A. Bhattacharya, "A Novel Quadratic Non-Isolated and Two Novel High Gain Isolated Multi-Output Buck-Boost DC-DC Converter Topologies for High Continuous Battery Current Application," 2024 IEEE 4th International Conference on Sustainable Energy and Future Electric Transportation (SEFET), Hyderabad, India, 2024, pp. 1-6, doi: 10.1109/SEFET61574.2024.10718053.	Hyderabad, India	July 31-August 03, 2024
	Author	B. Kumar and A. Bhattacharya, "Secondary Side Control of Multi-Vehicle Inductive Charger by Using a Semi-Active Bridge Rectifier for Constant Power," 2024 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Mangalore, India, 2024, pp. 1-5, doi: 10.1109/PEDES61459.2024.10961580.	Mangalore, India	December 18-21, 2024

Author	A. Dattaroy and A. Bhattacharya, "A novel Isolated Four-Switch High Gain Buck-Boost DC-DC Converter featuring a Continuous Input Current operation and novel allied Converter for Multi-output characteristic," <i>2023 IEEE International Conference on Power Electronics, Smart Grid, and Renewable Energy (PESGRE)</i> , Trivandrum, India, 2023, pp. 1-6, doi: 10.1109/PESGRE58662.2023.10405128.	Thiruvananthapuram, India	December 17-20, 2023
Author	A. Dattaroy and A. Bhattacharya, "Design of a Novel Fourth-Order Closed Loop Voltage Controller of an Optimally Designed Dual Active Bridge DC-DC Step-Up Converter," <i>IECON 2023- 49th Annual Conference of the IEEE Industrial Electronics Society</i> , Singapore, Singapore, 2023, pp. 1-6, doi: 10.1109/IECON51785.2023.10312232.	Singapore	October 16-19, 2023
Author	B. Kumar and A. Bhattacharya , "Wireless Charging of Multiple EVs by using a Multi-Output Inverter," 2023 IEEE 3rd International Conference on Smart Technologies for Power, Energy and Control (STPEC), Bhubaneswar, India, 2023, pp. 1-6, doi: 10.1109/STPEC59253.2023.10430886.	Bhubaneswar, India	December 10-13, 2023
Author	Ramjee Lal Meena, Arkabrata Dattaroy and Avik Bhattacharya . "Supercapacitor-based Active Stabilization Method for DC Microgrid with Constant Power Load Causing Instantaneous Instability," IEEE 11th International Conference on Smart Grid June 4-7, 2023, Paris, France	Paris	June 4-7, 2023
Author	<p>Rubell Sen Goopta, Shubhajit Pal and Avik Bhattacharya, "A Single DC Source Multilevel Inverter for Stand-Alone Applications", Proceedings of the 2023 5th International Conference on Sustainable Technologies for Industry 5.0 (STI 2023), Dec. 9-10, 2023, Rupganj, Dhaka, Bangladesh.</p> <p>Rubell Sen Goopta, Abdul Awal Rafi, Shubhajit Pal, and Avik Bhattacharya, "A Reduced Component Count Multilevel Inverter for Single and Three Phase Applications", Proceedings of the 7th International Conference on Computer Applications in Electrical Engineering (CERA 2023), Oct. 27-29, 2023, IIT Roorkee, UK, India.</p>	<p>Rupganj, Dhaka, Bangladesh</p> <p>Roorkee, UK, India.</p>	<p>Dec. 9-10, 2023</p> <p>Oct. 27-29, 2023</p>

	Author	S. Pal and A. Bhattacharya , "Seven Level Packed-U Cell based Standalone PV System for Water Pump Application," 2022 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES) , Jaipur, India, 2022, pp. 1-6, doi: 10.1109/PEDES56012.2022.10080008.	Jaipur, India	14-17 Dec. 2022
	Author	P. Priyadarsini and A. Bhattacharya , "A Novel GRID Integrated WECs with SMC for Wind Farm Commitment," 2022 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES) , Jaipur, India, 2022, pp. 1-2, doi: 10.1109/PEDES56012.2022.10080756.	Jaipur, India	14-17 Dec. 2022
	Author	S. K. Chaurasiya, A. Bhattacharya and S. Das, "Variable speed hybrid control of a switched reluctance generator for WECS," 2022 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES) , Jaipur, India, 2022, pp. 1-6, doi: 10.1109/PEDES56012.2022.10080615.	Jaipur, India	14-17 Dec. 2022
	Reviewer, Author	Pal Shubhajit, R. S. Gupta, V Muneer, and Avik Bhattacharya . "Reduced Switch MLI Based Single Phase Induction Motor for Standalone Water Pump Application," <i>IEEE IAS GLOBCONPT</i> , 2022.	Delhi, India	23-25 Sept. 2022
	Reviewer, Author	Priyanka Priyadarsini and Avik Bhattacharya . "A Novel PMSG based WECs with SMC for Wind Farm Commitment using Battery Charging System," <i>IEEE IAS GlobConET</i> , 2022.	Romania	20-22 May 2022
	Reviewer, Author	Chaurasiya Suraj Kumar, Avik Bhattacharya , and Sharmili Das. "Reduced switch multilevel converter topology to improve magnetization and demagnetization characteristics of an SRM." 2022 <i>IEEE International Conference on Power Electronics, Smart Grid, and Renewable Energy (PESGRE)</i> . IEEE, 2022.	Kerla, India	2-5 Jan 2022
	Reviewer, Author	R. S. Gupta and A. Bhattacharya , "Reduced Switch 13 Level Inverter for Grid-Connected Applications," 2021 IEEE International Power and Renewable Energy Conference (ICON), 2021, pp. 1-6, DOI: 10.1109/IPRECON52453.2021.9640658.	Kollam, India	24-26 Sept. 2021
		Rubell Sen Goopta & Avik Bhattacharya, "Reduced Switch 13 Level Inverter for Grid Connected Applications," Proceedings of the 2021 IEEE International Power and Renewable Energy Conference (IPRECON-2021), 24-26 September 2021, Karunagappally, Kerala, India.	Karunagappally, Kerala, India	24-26 Sept. 2021

		Rubell Sen Goopta & Avik Bhattacharya, "Grid-Tied Power Generation through Cross-Connected Source Based Multilevel Inverter", Proceedings of the International Conference on Sustainable Development in Technology for 4th Industrial Revolution 2021, (ICSdTIR-2021), 12 – 13 March, 2021, Chattogram, Bangladesh.	Chattogram, Bangladesh	12-13 March, 2021
	Reviewer, Author	Rubell Sen Goopta & Avik Bhattacharya , "MCPWM Based 21 Level Inverter Design for Grid Connected PV System," IEEE PEDES 2020.	Rajasthan, India	16-19 Dec. 2020
	Reviewer, Track chair	D. Antalem, A. Bhattacharya , "Decentralized control for grid-interactive hybrid dc/ac ring microgrid under input source fluctuations," 2020 IEEE International Conference on Computing, Power and Communication Technologies, 2020.	Delhi, India	October 2-4, 2020
	Reviewer	Rubell Sen Goopta, Sagar Kumar Dhar & Avik Bhattacharya , "A New Reduced Switch Diode Clamped Multilevel Inverter Topology," 2020 IEEE International Conference on Computing, Power and Communication Technologies (GUCON 2020).	Delhi, India	October 2-4, 2020
	Reviewer and Track chair. Received best paper award.	Rubell Sen Goopta & Avik Bhattacharya, "Reduced Switch Multilevel Inverter with Symmetrical & Asymmetrical DC Sources for Solar PV Applications," 2020 IEEE Region 10 Symposium (TENSymp), 5-7 June 2020, Dhaka, Bangladesh. Rubell Sen Goopta & Avik Bhattacharya, "MCPWM Based 21 Level Inverter Design for Grid Connected PV System," 2020 11th International Conference on Electrical and Computer Engineering (ICECE), December 17-19, 2020, Dhaka, Bangladesh. 7. Rubell Sen Goopta, Sagar Kumar Dhar & Avik Bhattacharya, "A New Reduced Switch Diode Clamped Multilevel Inverter Topology," 2020 IEEE International Conference on Computing, Power and Communication Technologies (GUCON 2020), October 2-4, 2020, NCR New Delhi, India.	Dhaka, Bangladesh Dhaka, Bangladesh New Delhi, India	5-7 June 2020 Dec17-19, 2020 Oct. 2-4, 2020
	Reviewer	V Muneer, A. Bhattacharya , "Twenty Switch Three Level CHB Based UPQC," 2019 IECON 45th Annual Conference of the IEEE Industrial Electronics Society, 2019, pp. 2094-2099.	Lisbon, Portugal.	2019/10/14
	Reviewer	Toshi Sharma, A. Bhattacharya , "Comparative Study of 2-DTC techniques for a 3 Level NPC	Lisbon, Portugal.	2019/10/14

		Inverter fed IPMSM Drive," <i>IECON 2019-45th Annual Conference of the IEEE Industrial Electronics Society, 2019</i> , pp. 6096-6101.		
Presenter, Reviewer, session Chair	Haris Ahmed, A. Bhattacharya , "Model Predictive Control of DMC based SST," <i>2019 IEEE Region 10 Symposium (TENSymp), 2019</i> , pp. 836-841.	Kolkata, India.	2019/6/7	
Reviewer and Session chair	V Muneer, A. Bhattacharya , Chandra Prakash Gupta, "Eight Switch CHB based Three-Phase Shunt Active Filter," <i>2018 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), 2018</i> , pp. 1-6.	Madras, India.	2018/12/18	
Reviewer and Session chair	Ginbar Ensermu, A. Bhattacharya , "Control and stability analysis of dc micro-grids with constant power loads and source disturbances," <i>2018 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), 2018</i> , pp. 1-6.	Madras, India.	2018/12/18	
Reviewer	V Muneer, A. Bhattacharya , "Cascaded H Bridge Multi Level Inverter Based Unified Power Quality Conditioner," <i>2018 IEEE 8th Power India International Conference (PIICON), 2018</i> , pp. 1-5.	Haryana, India.	2018/12/10	
Reviewer. Session chair and Track Chair	V Muneer, A. Bhattacharya , " Cascaded H Bridge based Three-Phase Four-Wire UPQC," <i>2018 IEEE 13th International Conference on Industrial and Information Systems (ICIIS), 2018</i> , pp. 412-417.	Ropar, India.	2018/12/1	
Reviewer and Session chair	Ginbar Ensermu, A. Bhattacharya , " Design of Decentralized Droop Control Structure of DC Microgrid with Constant Power Loads and Source Disturbances," <i>2018 IEEE Innovative Smart Grid Technologies-Asia (ISGT Asia), 2018</i> , pp. 91-96.	Raffles Blvd, Singapore.	2018/5/22	
Reviewer and Session chair	V Muneer, Jithin Sukumaran, A. Bhattacharya , " Investigation on reduced DC link voltage based UPQC for harmonic compensation under unbalanced load," <i>2017 International Conference on Technological Advancements in Power and Energy (TAP Energy), 2017</i> , pp. 1-6.	Kerala, India.	2017/12/21	
Reviewer and Session chair	V Muneer, A. Bhattacharya , " Shunt Hybrid Active Filter By Using Cascaded H Bridge Multilevel Inverter," <i>2017 14th IEEE India Council International Conference (INDICON), 2017</i> , pp. 1-5.	Roorkee, India.	2017/12/15	
Reviewer and Session chair	Tamiru Debela, Ginbar Ensermu, A. Bhattacharya , " Design, control and simulation of grid connected DC/AC microgrid for residential applications," <i>2017 Second International Conference on Electrical, Computer and Communication Technologies (ICECCT), 2017</i> , pp. 1-6.	Tamil Nadu, India.	2017/2/22	

Presenter, Reviewer and Session chair	Tamiru Debela, A. Bhattacharya , "Design and analysis of a DC/AC microgrid with centralized battery energy storage system," <i>IECON 2017-43rd Annual Conference of the IEEE Industrial Electronics Society</i> , 2017, pp. 8779-8784.	Beijing, China.	2017/10/29
Presenter, Reviewer and Session chair	A. Bhattacharya , "3-level Z-source inverter based PV system with bidirectional buck-boost BESS," <i>2016 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES)</i> , 2016, pp. 1-6.	Kerala, India.	2016/12/14
Reviewer and Session chair	A. Bhattacharya , RL Meena, DK Khatod, "Control and operation of grid-connected solar photovoltaic for DC microgrid application," <i>2016 IEEE 7th Power India International Conference (PIICON)</i> , 2016, pp. 1-5.	Bikaner, India.	2016/11/25
Reviewer and Session chair	Haris Ahmed, A. Bhattacharya , "PMSG based constant power delivery standalone WECS using SST with bidirectional buck-boost BESS," <i>2016 IEEE 7th Power India International Conference (PIICON)</i> , 2016, pp. 1-6.	Bikaner, India.	2016/11/25
Reviewer and Session chair	Jithin Sukumaran, Amal Thomas, A. Bhattacharya , "A reduced voltage rated unified power quality conditioner for harmonic compensations," <i>2016 IEEE 7th Power India International Conference (PIICON)</i> , 2016, pp. 1-6.	Bikaner, India.	2016/11/25
Reviewer and Session chair. [Received Fatema Rashid Best Paper award]	Haris Ahmed, A. Bhattacharya , "A novel DMC based SST for voltage and frequency regulation of PMSG based WECS," <i>2015 International Conference on Advances in Electrical Engineering (ICAEE)</i> , 2015, pp. 310-313.	Dhaka, Bangladesh.	2015/12/17
Presenter Reviewer and Session chair.	Medha Pandey, Anirban Sinha Ray, A. Bhattacharya , "Transformerless dual inverter-based series injected shunt active power filter," <i>2015 International Conference on Advances in Electrical Engineering (ICAEE)</i> , 2015, pp. 301-305.	Dhaka, Bangladesh.	2015/12/17
Presenter, Reviewer and Session chair.	A. Kumar, A. Bhattacharya , "Three level Z source inverter based photovoltaic power conversion systems," <i>IECON 2015-41st Annual Conference of the IEEE Industrial Electronics Society</i> , 2015, pp. 001357-001362.	Yokohama, Japan.	2015/11/9
Presenter Reviewer	H. Ahmed, B. Brijwasi, A. Bhattacharya , "A novel PMSG based WECS for grid integration using DMC," <i>IECON 2015-41st Annual</i>	Yokohama, Japan.	2015/11/9

	and Session chair.	<i>Conference of the IEEE Industrial Electronics Society, 2015, pp. 001345-001350.</i>		
	Presenter Reviewer and Session chair.	Anirban Sinha Ray, A. Bhattacharya , "A noble transformer coupled shunt active hybrid power filter," <i>2015 IEEE International Conference on Industrial Technology (ICIT), 2015, pp. 2571-2579.</i>	Seville, Spain	2015/3/17
Before Joining IIT Roorkee				
	Presenter	S Basu Tuhin, Avik Bhattacharya , Chandan Chakraborty, "Shunt active power filter/STATCOM topology for medium/high power applications: Parallel inverters operating at different switching frequencies", <i>IECON 2010-36th Annual Conference on IEEE Industrial Electronics Society, 2010, pp. 2669-2674.</i>		2010/1/7
	Presenter	Avik Bhattacharya , Chandan Chakraborty, Subhashish Bhattacharya, "A reduced switch transformer-less dual hybrid active power filter", <i>35th Annual Conference of IEEE Industrial Electronics, 2009, pp. 88-93.</i>		2009/1/3
	Presenter	Avik Bhattacharya, Chandan Chakraborty, "Harmonic elimination and reactive power compensation through a shunt active power filter by twin neural networks with predictive and adaptive properties", <i>IEEE International Conference on Industrial Technology, 2009, pp. 1-6.</i>		2009/2/10
	Presenter	Avik Bhattacharya , Chandan Chakraborty, "Adaline controlled 3-phase 3-wire shunt active power filter with enhanced performance using the capacitor voltage feedback", <i>IEEE International Conference on Industrial Technology, 2009, pp. 1-6.</i>		2009/2/10
	Presenter	Avik Bhattacharya , Chandan Chakraborty, "ANN (Adaline) based harmonic compensation for shunt active power filter with capacitor voltage based predictive technique", <i>IEEE Region 10 and the Third international Conference on Industrial and Information Systems, 2008, pp. 1-6.</i>		2008/1/2/8
	Presenter	Avik Bhattacharya , Chandan Chakraborty, "Predictive and adaptive ANN (adaline) based harmonic compensation for shunt active power filter", <i>IEEE Region 10 and the Third international Conference on Industrial and Information Systems, 2008, pp. 1-6.</i>		2008/1/2/8

NPTEL Courses Offered:

S.No.	Name of the course	Tenure	Rerun
1.	Power quality improvement techniques	Jan 2020-May 2020	Jan 2022-Mar 2022
2.	DC microgrid & control	Jul 2019-Sept 2019	Jul 2020-Sept 2020
3.	Advanced power electronics & control	Jan 2019-Mar 2019	Jan 2020-May 2020
4.	FACT devices	Jul 2018-Sept 2018	NA

Guided Post Doctoral Fellow : (Supervisor : Dr. A. Bhattacharya)

SI No.	Name of student	Project	Period
1.	Dr. Rishiraj Sarker	Smart SiC-based Electric Vehicle Charging from Solar/Grid-based System	15th May 2023 -10th Jan 2025
2	Dr. Azra Malik	Smart SiC-based Electric Vehicle Charging from Solar/Grid-based System	5th May 2025-Present

Guided PhD students : (Supervisor : Dr. A. Bhattacharya)

SI No.	Name of student	Research Topic	Period
2.	HARISH AHMED	INVESTIGATION ON SOLID STATE TRANSFORMER	01 Jan 2014 - 30 Jun 2020
3.	TOSHI SHARMA	APPLICATION OF DTC FOR PMSM BASED ELECTRIC DRIVE	01 Jan 2015 - 05 Jul 2021
4.	GINBAR E	INVESTIGATION ON DC MICROGRID	01 Jan 2015 - 31 Mar 2020
5.	MUNEER V	INVESTIGATION ON UPQC TOPOLOGY OF WEEK GRID	01 Jan 2016 - 16 Jan 2023
6.	PRIANKA PRIYADARSINI	INVESTIGATION ON INDIRECT MATRIX CONVERTER	01 Jan 2017 - 24 Mar 2025
7.	RUBELL SEN GOOPTA	MULTILEVEL INVERTER FOR SOLAR PV APPLICATIONS	11 Jul 2017 - 10 Oct 2022
8.	DIRESS TILAHUN ANTALEM	INVESTIGATION ON DC/AC MICROGRID (Received Phd thesis report viva voce exam is schedule end of July 2023)	16 Jul 2018 - Present
9.	SURAJ KUMAR CHAURASIYA (Other Supervisors: Dr. Sharmili Das)	INVESTIGATION ON MULTILEVEL CONVERTER FED SRM DRIVE	12 July 2019 - 24 Feb 2025

10.	SHUBHAJIT PAL	INVESTIGATIONS ON CONVERTERS AND THEIR CONTROL TECHNIQUES FOR PV SYSTEM.(Given synopsis seminar)	25 Aug 2020 - Present
11.	ARKABRATA DATTAROY	Novel DC-DC Converters	18 Dec 2021 - Present
12.	SUBHABRATA PAL	Novel Fast Charging Application of EV	18 Dec 2021 - Present
13.	BIBEK KUMAR	Wireless Charging for EV application	01 Aug 2022 - Present
14.	ARNAB CHATTERJEE	Electric Drives	02 Jan 2023 - Present
15.	AMARJEET PRASAD	Multilevel Inverter	26 Dec 2023 - Present
16.	Joni Sk	DC-DC converter topologies	20 July 2022 - Present
17.	Anjani Kumar Mishra	Solar Inverter and PWM Techniques	12 June 2024 - Present
18.	Piyush Patel	DC-DC converter	15 July 2025- Present

Guided M.Tech Projects – ROORKEE STUDENTS: (Supervisor : Dr. A. Bhattacharya)

SI No.	Name of student	Project Title	Period
1.	Yakshraj Sharma	DC-DC converter	2022-24
2.	Ayush Chauhan	DC-DC converter	2022-24
3.	Osman Omer	Investigation on a stand-alone DC microgrid	2020-22
4.	Brijesh Kumar Kasaudhan	Hybrid Source based Power System of an Electric Vehicle	2018-20
5.	Jerry Cherian	Design and performance analysis of 3-phase solar PV-integrated UPQC along with supercapacitor for Power quality enhancement and energy storage	2017-20
6.	Apurv Srivastava	Performance investigation of quasi-Z source inverter for photo voltaic application	2016-19
7.	Vikash Jhuria	Investigation of quasi-z-source inverter	2012-18
8.	Tamiru Debela Awas	Investigation of interconnection on AC-DC microgrid.	2015-17
9.	Jithin Sukumaran	Analysis of unified power quality conditioner for AC microgrid	2015-17
10.	Manish Kumar Dwivedi	Investigation on matrix converter fed DFIG for wind energy conversion.	2015-17

11.	Medha Pandey	Performance evaluation of multilevel inverter based shunt active power filter.	2012-17
12.	Anirban Sinha Ray		2012-2017
13.	Amal Thomas	Performance investigation of unified power quality conditioner	2014-16
14.	Deepak Kumawat	Investigation on the effect of shading of output power of PV arrays.	2010-2016
15.	Gajendra Kumar		2011-16
16.	Kritgya Bawal	Development of three-phase universal PFC circuit for DC microgrid application.	2011-16
17.	ABIN M	Development of a fast battery charger with power factor correction for electric vehicle.	2014-16
18.	Harshit	3-level Z-source inverter-based PV system with bidirectional buck-boost BESS.	2010-16
19.	Kamodula Lokeswara Rao	Performance investigation of novel regenerative braking for electric vehicle.	2013-15
20.	Harshit Agarwal	A novel power factor correction technique for three-phase system.	2013-15
21.	Brijesh Brijwasi	Application of matrix converter in wind energy conversion system using PMSG.	2010-15
22.	Ajit Kumar	Performance Investigation of Multilevel Z-Source Inverter for Photovoltaic Systems	2010-15

Invited Talks:

S.NO	TOPIC	ORGANISATION	DATE	CATEGORY
1.	Application of power electronics in renewable energy applications	Adhiyamaan College of Engineering	5 AUG 2020	AICTE
2.	Power electronics applications in high voltage engineering	Saranathan College of Engineering	1 AUG 2020	AICTE
3.	Recent development on solid state transformer & inverters for renewable energy application	Department of EE, IEST, Shibpur	17 DEC 2019	IEEE-IAS
4.	Investigation on SST with IMC	Heritage Institute of Technology	24 SEPT 2019	IEE-EDS
5.	Renewable energy and solar inverter topologies	Vinoba Bhave University, Hazaribag, Jharkhand	16-17 SEPT 2019	TEQIP-III

6.	Recent advancement of power electronic devices & its applications	Manipal University, Jaipur	30 JAN 2019	QIP
7.	Recent advances and industrial applications of power electronic converters and electrical machines	Department of EE, Zakir Hussain College of Engineering, A.M.U., Aligarh	22-26 OCT 2018	TEQIP-III
8.	Recent advancement on solid state transformers	Department of EE, Aligarh Muslim University	10 OCT 2018	TEQIP-III
9.	Recent advancement of DC microgrid	Ajay Kumar Gang Engineering College	26 SEPT 2016	QIP
10.	Recent advancement in smart grid is power quality issues	College of Engineering Kolaghat	11 JUN 2016	QIP

ACADEMIC ACTIVITIES ORGANIZED BY THE DEPARTMENT

Name of the workshop-short term course	Role of the Faculty	Sponsored by	Dates
Micro Grid stability, Protection and Control	Course- Co-coordinator	QIP –IIT Roorkee	2019/5/27-31

SPONSORED RESEARCH PROJECTS (Summery):

Sl. No.	Project Status	Total No. of Projects	Amount (Rs. in lacs)
1	Completed Projects	3	35.7
2.	Ongoing Projects	2	157

SPONSORED RESEARCH PROJECTS (Detail):

1.	Title:	Luminous SIS: Illumination Solar Inverters Sustainability
	Funding agency	CSR Initiative: Luminous Power Technologies Pvt. Ltd.
	Role	Principal Investigator
	Cost	63.34 Lakhs
	Tenure	2.5 years
	Status	Ongoing

2.	Title:	Permanent Magnet Synchronous Generator Based Novel Bi-Directional Converter for Wind Applications
	Funding agency	IIT ROORKEE
	Role	Principal Investigator
	Cost	10 Lakhs
	Tenure	3 Years
	Status	Completed

3.	Title:	An Investigation on Solid State Transformer
	Funding agency	SCIENCE & ENGINEERING RESEARCH BOARD (SERB)
	Role	Principal Investigator
	Cost	25.71 Lakhs
	Tenure	3 years
	Status	Closer Report submitted.

4.	Title:	Investigation on MRAS based Direct Torque Controlled PMSM drive for EV Application
	Funding agency	COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH (CSIR)
	Role	Principal Investigator
	Cost	9.5 Lakhs
	Tenure	3 years
	Status	Closer Report submitted.

5.	Title:	Mobile Substation and Grid Storage System
	Funding agency	Department of science & Technology.
	Role	Co-Principal Investigator
	Cost	1.4 Crore (IIT Roorkee Budget)
	Tenure	4 years 8 months
	Status	On going

RESEARCH PUBLICATION:

Sl. No.	Details	Total Number
a	Total International Conference	75
b	International Journal	25
c	Patents Granted	1
d	Patents Filed	2

List of Selected Journal Publications

1. R. Sarker, S. Pal and A. Bhattacharya, "Support Vector Machine-Integrated High-Definition MCPWM Technique for Improving Power Quality in Multilevel Inverters," in IEEE Transactions on Industrial Electronics, vol. 73, no. 1, pp. 82-93, Jan. 2026, doi: 10.1109/TIE.2025.3595994.
2. P. Priyadarsini, **A. Bhattacharya**, H. Ahmed and M. V, "Design and Implementation of a Novel High Gain Impedance Network Integrated Sparse Matrix Converter to Enhance the Performance of WECs," in IEEE Transactions on Consumer Electronics, doi: 10.1109/TCE.2024.3487076.
3. P. Priyadarsini, **A. Bhattacharya** and M. V, "A Novel SMC Integrated WECs for Wind Farm Commitment Implementing Battery Storage System," in IEEE Transactions on Industry Applications, vol. 61, no. 1, pp. 583-596, Jan.-Feb. 2025, doi: 10.1109/TIA.2024.3462912.
4. S. K. Chaurasiya, **A. Bhattacharya** and S. Das, "Unified Four-Quadrant Control of Dual-Port Solar-Assisted Switched Reluctance Drive for Electric Ferries With Power Flow Management," in IEEE Transactions on Transportation Electrification, vol. 10, no. 4, pp. 7941-7953, Dec. 2024, doi: 10.1109/TTE.2024.3443175.
5. R. Sarker, **A. Bhattacharya**, S. Debnath, A. Castillo-Atoche and A. Datta, "A Novel FPGA-Driven HD-SPWM Architecture With Zero-Sequence Voltage Insertion Strategy for Three-Level NPC Inverter," in IEEE Transactions on Industrial Informatics, vol. 20, no. 9, pp. 10814-10824, Sept. 2024, doi: 10.1109/TII.2024.3393566.
6. S. Pal, **A. Bhattacharya** and M. V, "Open-Loop Capacitor Voltage Balancing of a Nine-Level Packed U-Cell Converter," in IEEE Transactions on Industry Applications, vol. 60, no. 4, pp. 6446-6457, July-Aug. 2024, doi: 10.1109/TIA.2024.3397776.

7. Pal, S., Bhattacharya, A., & Sen Goopta, R. (2024). Designing of a Reduced Switch MLI-Based Standalone Solar Inverter Suitable for Water Pump Application. *IETE Technical Review*, 41(6), 695–708. <https://doi.org/10.1080/02564602.2024.2357545> (Awarded for best paper - Dr. Meghnad Saha best paper award).
8. S. K. Chaurasiya, **A. Bhattacharya** and S. Das, "Reduced Switch Multilevel Converter for Grid Fed SRM Drive to Improve Magnetization and Demagnetization Characteristics of an SRM," in *IEEE Transactions on Industry Applications*, vol. 59, no. 6, pp. 6804-6816, Nov.-Dec. 2023, doi: 10.1109/TIA.2023.3305594.
9. V. Muneer, G. M. Biju and **A. Bhattacharya**, "Optimal Machine-Learning-Based Controller for Shunt Active Power Filter by Auto Machine Learning," in *IEEE Journal of Emerging and Selected Topics in Power Electronics*, vol. 11, no. 3, pp. 3435-3444, June 2023, doi: 10.1109/JESTPE.2023.3244605.
10. Muneer V and **Avik Bhattacharya**, "Second Order Sliding Mode Control for Three Level H Bridge based Unified Power Quality Conditioner with Vanilla Feed-Forward Neural Network", *IEEE Journal of Emerging and Selected Topics in Industrial Electronics*, 2022.
11. Rubell Sen Goopta & **Avik Bhattacharya**, "Low and High Frequency Control Strategy for Asymmetrically Switched Cascaded Multilevel Inverter", *IETE Journal of Research (Taylor and Francis)*, Oct. 18, 2022.
12. Toshi Sharma and **Avik Bhattacharya**, "Transient and Steady-State Study of a Speed Sensorless IPMSM Drive with an Advanced Integrator based Stator Flux Estimator", *IET Power Electronics*, 2021 I.F.- 3.530.
13. Muneer V and **Avik Bhattacharya**, "Peak Power Demand Management by Using SMC Controlled Three Level CHB based Three Wire and Four wire SAPF", *IEEE transaction on industrial informatics*, 2021 I.F.-9.111.
14. Rubell Sen Goopta & **Avik Bhattacharya**, "Asymmetrically Switched CHB Multilevel Inverters with Harmonic Mitigation Techniques Applied to Photovoltaic Power Generation," *IETE Journal of Research (Taylor and Francis)*, 26 July, 2020.
15. Muneer V and **Avik Bhattacharya** "Eight Switch CHB Based Three-level Three-Phase Shunt Active Power Filter", *IET Power Electronics - Volume 13, Issue 16, 16 December 2020*, p. 3511 – 3521, I.F.- 3.530.
16. Haris Ahmed and **Avik Bhattacharya**, "PMSG Based VS-WECS for Constant Active Power Delivery to standalone load Using DMC based SST with BESS," *IET Generation, Transmission & Distribution*, 13 pp, December 2018, I.F.-4.10.
17. Anirban Sinha Ray and **Avik Bhattacharya**, "Improved Tracking of Shunt Active Power Filter by Sliding Mode Control," *Electrical Power and Energy system, Elsevier*.Vol-78, Pg. No. 916-925, June 2016, I.F.-3.588.

18. **Bhattacharya, A.**; Chakraborty, C.; Bhattacharya, S. "parallel-connected Shunt Hybrid Active Power Filters Operating at Different Switching Frequencies for Improved Performance", **Industrial Electronics, IEEE Transactions**, On page(s): 4007 - 4019 Volume: 59, Issue: 11, Nov. 2012, **I.F.-8.70**.
19. **A. Bhattacharya** and C. Chakraborty, "A Shunt Active Power Filter with Enhanced Performance Using ANN-based Predictive and Adaptive Controllers," **Industrial Electronics, IEEE Transactions**, on vol.58, no.2, pp.421-428, Feb.2011, **I.F.-8.70**.
20. **A. Bhattacharya** and C. Chakraborty, "Recursive least square-based ANN tuned reference generation technique for shunt active power filter," **International Journal of Power Engineering & Green Technology**, on vol.11, no.1, pp.1-9 in Jul. 2010, **I.F.-1.175**.
21. **A. Bhattacharya**, C. Chakraborty and S. Bhattacharya, "Current compensation in shunt type active power filters," **IEEE Industrial Electronics Magazine**, vol.-3, no.-3, pp.-38-49, 2009, I.F.- **13..311**.
22. **A. Bhattacharya**, C. Chakraborty and S. Bhattacharya, "Shunt compensation," in **IEEE Industrial Electronics Magazine**, vol. 3, no. 3, pp. 38-49, Sept. 2009, doi: 10.1109/MIE.2009.933881.

Communicated journal, Sponsored research project, consultancy project, book/ book chapter

Book Chapter:

1. Title of the chapter

Grid-Tied Completely Soft-Switched Isolated DC/DC Converter Architecture Using Charge Management Method for Fast EV Charging Station

2. Author(s)

- i) **Mr. Subhabrata Pal (Research Scholar, EED, IIT Roorkee)**
- ii) **Prof. Avik Bhattacharya (Associate Professor, EED, IIT Roorkee)**

3. Details of citation & publishers:

- a) DOI: https://doi.org/10.1007/978-981-97-6091-6_21
- b) Publisher Name: Springer, Singapore
- c) Date of publication: 03/01/2025
- d) Print ISBN: 978-981-97-6090-9
- e) Online ISBN: 978-981-97-6091-6

Patent Granted:

1. Title of the project/Invention

A THREE PHASE FOUR WIRE CASCADED H-BRIDGE BASED REDUCED SWITCH HYBRID SHUNT ACTIVE POWER FILTER

2. Inventor (s) / Collaborator (s) filling the patent

- (a) **Dr. Muneer V** Designation **Research Scholar, EED**
- (b) **Prof. Avik Bhattacharya** Designation **Assistant Professor, EED**
- (c) **Mr. Arkabrata Dattaroy** Designation **Research Scholar, EED**

3. Principal Investigator **Prof Avik Bhattacharya, Assistant Professor, EED, IIT Roorkee**

4. Patent Grant No.: **565688 (Indian Patent)**

5. Patent Award Date: **29/04/2025**

6. Sponsor (s) / Source of Funding of the project/ consultancy – with or without prior contractual agreement **Indian Institute of Technology Roorkee**

Details of Projects under implementation:

Prof. Avik Bhattacharya (PI)

1.	Title:	Luminous SIS: Illumination Solar Inverters Sustainably
	Funding Agency	CSR Initiative: Luminous Power Technologies Pvt. Ltd.
	Role	Principal Investigator
	Cost	63.34 lakhs
	Tenure	2.5 years
	Status	Ongoing

2.	Title:	Mobile Substation and Grid Storage System
	Funding Agency	Department of Science & Technology.
	Role	Co-Principal Investigator
	Cost	1.46 Crore (IIT Roorkee Budget)
	Tenure	3 years
	Status	Ongoing

Details of Projects completed during the last 5 years:

Prof. Avik Bhattacharya (PI)

1.	Title:	Permanent Magnet Synchronous Generator Based Novel Bi-Directional Converter for Wind Applications
	Funding agency	IIT ROORKEE
	Role	Principal Investigator
	Cost	10 Lakhs
	Tenure	3 Years
	Status	Completed

2.	Title:	An Investigation on Solid State Transformer
	Funding agency	SCIENCE & ENGINEERING RESEARCH BOARD (SERB)
	Role	Principal Investigator
	Cost	25.71 Lakhs
	Tenure	3 years
	Status	Completed

3.	Title:	Investigation on MRAS based Direct Torque Controlled PMSM drive for EV Application
	Funding agency	COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH (CSIR)
	Role	Principal Investigator
	Cost	9.5 Lakhs
	Tenure	3 years
	Status	Closure Report submitted.

Book: To be published:

1.	Title:	<i>Introduction to FACTS Devices</i>
	Publishing Agency	CRC Press/Taylor and Francis Group
	Targeted reader	Post graduate Power system and power electronics
	Role	Author

	Other member:	None
	Cost	100 \$
	To in market:	One and half years (December 2023)
	Status	On going