**Dr. Avik Bhattacharya**

***Institution* *Residence***

203/6, Saraswati Kunj,

Near Indian Institute of Technology Gate 5,

Roorkee, Uttarakhand, 247667, India.

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**Associate Professor**

Electrical Engineering Department**,**

Indian Institute of Technology Roorkee,

Roorkee, Uttarakhand 247667, India

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E-Mail: avik.bhattacharya@ee.iitr.ac.in

**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**

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

**Peer Reviewed Conference Proceedings:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | |  |  |  |
| **SL.**  **No.** | **Role the of Faculty** | **Details of Conference** | **Venue** | **Date** |
| **After Joining IIT Roorkee** | | | | |
|  | 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 | S. Pal and **A. Bhattacharya**, "Seven Level Packed-U Cell based Standalone PV System for Water Pump Application," 2022 **IEEE International Conference on Power Electronic**s, 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," *IEEE IAS GLOBCONPT*, 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," *IEEE IAS GlobConET, 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 IEEE International Conference on Power Electronics, Smart Grid, and Renewable Energy (PESGRE)*. 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 |
|  | 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 &amp; Asymmetrical DC Sources for Solar PV Applications,” 2020 IEEE Region 10 Symposium (TENSYMP). | Dhaka, Bangladesh | 5-7 June 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 Inverter fed IPMSM Drive," *IECON 2019-45th Annual Conference of the IEEE Industrial Electronics Society, 2019, pp.* 6096-6101*.* | Lisbon, Portugal. | 2019/10/14 |
|  | Presenter, Reviewer, session Chair | Haris Ahmed, **A. Bhattacharya**, "Model Predictive Control of DMC based SST," *2019 IEEE Region 10 Symposium (TENSYMP),* *2019, 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," *2018 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES)*, 2018, 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," *2018 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES)*, 2018, pp. 1-6. | Madras, India. | 2018/12/18 |
|  | Reviewer | V Muneer, **A. Bhattacharya**, "Cascaded H Bridge Multi Level Inverter Based Unified Power Quality Conditioner," *2018 IEEE 8th Power India International Conference (PIICON)*, 2018, 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," *2018 IEEE 13th International Conference on Industrial and Information Systems (ICIIS)*, 2018, 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," *2018 IEEE Innovative Smart Grid Technologies-Asia (ISGT Asia)*, 2018, 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," *2017 International Conference on Technological Advancements in Power and Energy (TAP Energy)*, 2017, 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," *2017 14th IEEE India Council International Conference (INDICON)*, 2017, 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," *2017 Second International Conference on Electrical, Computer and Communication Technologies (ICECCT),* 2017, 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,” *IECON 2017-43rd Annual Conference of the IEEE Industrial Electronics Society,* 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," *2016 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES),* 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," *2016 IEEE 7th Power India International Conference (PIICON),* 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," *2016 IEEE 7th Power India International Conference (PIICON),* 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," *2016 IEEE 7th Power India International Conference (PIICON)*, 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," *2015 International Conference on Advances in Electrical Engineering (ICAEE),* 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," *2015 International Conference on Advances in Electrical Engineering (ICAEE),* 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," *IECON 2015-41st Annual Conference of the IEEE Industrial Electronics Society,* 2015, pp. 001357-001362. | Yokohama, Japan. | 2015/11/9 |
|  | Presenter Reviewer and Session chair. | H. Ahmed, B. Brijwasi, **A. Bhattacharya**, “A novel PMSG based WECS for grid integration using DMC," *IECON 2015-41st Annual Conference of the IEEE Industrial Electronics Society*, 2015, pp. 001345-001350. | Yokohama, Japan. | 2015/11/9 |
|  | Presenter Reviewer and Session chair. | Anirban Sinha Ray, **A. Bhattacharya**, “A noble transformer coupled shunt active hybrid power filter," *2015 IEEE International Conference on Industrial Technology (ICIT)*, 2015, pp. 2571-2579. | Seville, Spain | 2015/3/17 |
| **Before Joining IIT Roorkee** | | | | |
| **33.** | 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”, IECON 2010-36th Annual Conference on IEEE Industrial Electronics Society, 2010, pp. 2669-2674. |  | 2010/11/7 |
| **34.** | Presenter | **Avik Bhattacharya**, Chandan Chakraborty, Subhashish Bhattacharya, “A reduced switch transformer-less dual hybrid active power filter”, 35th Annual Conference of IEEE Industrial Electronics, 2009, pp. 88-93. |  | 2009/11/3 |
| **35.** | 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”, IEEE International Conference on Industrial Technology, 2009, pp. 1-6. |  | 2009/2/10 |
| **36.** | Presenter | **Avik Bhattacharya,** Chandan Chakraborty, “Adaline controlled 3-phase 3-wire shunt active power filter with enhanced performance using the capacitor voltage feedback”, IEEE International Conference on Industrial Technology, 2009, pp. 1-6. |  | 2009/2/10 |
| **37.** | Presenter | **Avik Bhattacharya,** Chandan Chakraborty, “ANN (Adaline) based harmonic compensation for shunt active power filter with capacitor voltage based predictive technique”, IEEE Region 10 and the Third international Conference on Industrial and Information Systems, 2008, pp. 1-6. |  | 2008/12/8 |
| **38.** | Presenter | **Avik Bhattacharya,** Chandan Chakraborty, “Predictive and adaptive ANN (adaline) based harmonic compensation for shunt active power filter”, IEEE Region 10 and the Third international Conference on Industrial and Information Systems, 2008, pp. 1-6. |  | 2008/12/8 |

**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)

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| --- | --- | --- | --- |
| **Sl No.** | **Name of student** | **Project** | **Period** |
|  | Dr. Rishiraj Sarker | Smart SiC-based Electric Vehicle Charging from Solar/Grid-based System | 15th May 2023 - present |

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

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| --- | --- | --- | --- |
| **Sl No.** | **Name of student** | **Research Topic** | **Period** |
|  | HARISH AHMED | INVESTIGATION ON SOLID STATE TRANSFORMER | 01 Jan 2014 - 30 Jun 2020 |
|  | TOSHI SHARMA | APPLICATION OF DTC FOR PMSM BASED ELECTRIC DRIVE | 01 Jan 2015 - 05 Jul 2021 |
|  | GINBAR E | INVESTIGATION ON DC MICROGRID | 01 Jan 2015 - 31 Mar 2020 |
|  | MUNEER V | INVESTIGATION ON UPQC TOPOLOGY OF WEEK GRID | 01 Jan 2016 - 16 Jan 2023 |
|  | PRIANKA PRIYADARSINI | INVESTIGATION ON INDIRECT MATRIX CONVERTER | 01 Jan 2017 - Present |
|  | RUBELL SEN GOOPTA | MULTILEVEL INVERTER FOR SOLAR PV APPLICATIONS | 11 Jul 2017 - 10 Oct 2022 |
|  | 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 |
|  | SURAJ KUMAR CHAURASIYA  (Other Supervisors: Dr. Sharmili Das) | STUDY OF DTC AND TORQUE RIPPLE MINIMIZATION OF SRM | 28 Aug 2019 - Present |
|  | SHUBHAJIT PAL | INVESTIGATIONS ON CONVERTERS AND THEIR CONTROL TECHNIQUES FOR PV SYSTEM.( Given synopsis seminar) | 25 Aug 2020 - Present |
|  | ARKABRATA DATTAROY | MOBILE SUBSTATION AND GRID STORAGE SYSTEM(MOBISUB) | 10 Sep 2021 - Present |
|  | SUBHABRATA PAL | Novel Fast Charing Application of EV | 03 Jan 2022 - Present |
|  | BIBEK KUMAR | Wireless Charging for EV application | 01 Aug 2022 - Present |
|  | ARNAB CHATTERJEE | Drives and Power Electronics | 02 Jan 2023 - Present |
|  | AMARJEET PRASAD | Multilevel Inverter | 26 Dec 2023 - Present |
|  | Joni Sk | DC-DC converter topologies | 20 July 2022 - Present |
|  | Anjani Kumar | Solar Inverter and PWM Techniques | 12 June 2024 - Present |

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

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl No.** | **Name of student** | **Project Title** | **Period** |
|  | Yakshraj Sharma | DC-DC converter (Ongoing) | 2022-24 |
|  | Ayush Chauhan | DC-DC converter (Ongoing) | 2022-24 |
|  | Osman Omer | Investigation on a stand-alone DC microgrid | 2020-22 |
|  | Brijesh Kumar Kasaudhan | Hybrid Source based Power System of an Electric Vehicle | 2018-20 |
|  | 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 |
|  | Apurv Srivastava | Performance investigation of quasi-Z source inverter for photo voltaic application | 2016-19 |
|  | Vikash Jhuria | Investigation of quasi-z-source inverter | 2012-18 |
|  | Tamiru Debela Awas | Investigation of interconnection on AC-DC microgrid. | 2015-17 |
|  | Jithin Sukumaran | Analysis of unified power quality conditionar for AC microgrid | 2015-17 |
|  | Manish Kumar Dwivedi | Investigation on matrix converter fed DFIG for wind energy conversion. | 2015-17 |
|  | Medha Pandey | Performance evaluation of multilevel inverter based shunt active power filter. | 2012-17 |
|  | Anirban Sinha Ray |  | 2012-2017 |
|  | Amal Thomas | Performance investigation of unified power quality conditioner | 2014-16 |
|  | Deepak Kumawat | Investigation on the effect of shading of output power of PV arrays. | 2010-2016 |
|  | Gajendtra Kumar |  | 2011-16 |
|  | Kritgya Bawal | Development of three-phase universal PFC circuit for DC microgrid application. | 2011-16 |
|  | ABIN M | Development of a fast battery charger with power factor correction for electric vehicle. | 2014-16 |
|  | Harshit | 3-level Z-source inverter-based PV system with bidirectional buck-boost BESS. | 2010-16 |
|  | Kamodula Lokeswara Rao | Performance investigation of novel regenerative breaking for electric vehicle. | 2013-15 |
|  | Harshit Agarwal | A novel power factor correction technique for three-phase system. | 2013-15 |
|  | Brijesh Brijwasi | Application of matrix converter in wind energy conversation system using PMSG. | 2010-15 |
|  | Ajit Kumar | Performance Investigation of Multilevel Z-Source Inverter for Photovoltaic Systems | 2010-15 |

**Invited Talks:**

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| --- | --- | --- | --- | --- |
| **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, IIEST, 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):**

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| --- | --- | --- |
| 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 |

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| **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 | Closer Report submitted. |

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| **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 | Closer Report submitted. |

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| **4.** | **Title:** | **Mobile Substation and Grid Storage System** |
| Funding agency | [**Department**](https://www.cpri.in/) **of science & Technology.** |
| Role | Principal Investigator |
| Cost | 1.47 Crore (IIT Roorkee Budget) |
| Tenure | 2 years 9 Months |
| Status | On going |

**RESEARCH PUBLICATION:**

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **Details** | **Total Number** |
| **a** | **Total International Conference** | **38** |
| **b** | **International Conference (after joining IIT Roorkee)** | **32** |
| **c** | **International Journal** | **22** |
| **d** | **International Journals(after joining IIT)** | **18 (Q1 Journal = 10)** |

**List of Peer-Reviewed Journal Publications**

**After Joining IIT Roorkee:**

1. P. Priyadarsini, **A. Bhattachrya**, 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. Muneer V and **Avik Bhattacharya**, “Second Order Sliding Mode Controll 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.
9. 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.
10. 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.
11. Muneer V and **Avik Bhattacharya** "Eight Switch CHB Based Three-level Three-Phase Shunt Active Power Filter", IET Power Electronics - [Volume 13, Issue 16](https://digital-library.theiet.org/content/journals/iet-pel/13/16), 16 December 2020, p. 3511 – 3521, I.F.- 3.530.
12. 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.
13. 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.

**Before Joining IIT Roorkee:**

1. **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.**
2. **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.**
3. **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.**
4. **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.**
5. **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**

**Patents Filed:**

1. Title of the project/Invention

***Novel Three Phase Four Wire Cascaded H-bridge based Reduced Switch Hybrid Shunt Active Power Filter***

1. Inventor (s) / Collaborator (s) filling the patent
2. **Mr. Muneer V** Designation **Research Scholar, EED**
   1. **Prof Avik Bhattacharya** Designation **Assistant Professor, EED**
   2. **Mr. Arkabrata Dattaroy** Designation **Research Scholar, EED**
3. Principal Investigator **Prof Avik Bhattacharya, Assistant Professor, EED, IIT Roorkee**
4. Sponsor (s) / Source of Funding of the project/ consultancy – with or without prior contractual agreement **Indian Institute of Technology Roorkee**

Multi-Modular Matrix Converter based Wind Energy Conversion System for High Power and High Voltage Application

Date of Submission: 26th August 2020

**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](https://www.cpri.in/) 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. |

**List of Communicated Research project( under review)**

|  |  |  |
| --- | --- | --- |
| **1.** | **Title:** | Grid integrated switched reluctance generator based system interfaced with Renewable Energy Sources |
| Name of the Scheme: | Core Research Grant |
| Funding agency | Science and Engineering Research Board (SERB) |
| Role | Principal Investigator |
| Other member: | Prof. Sharmili Das |
| Cost | 35 lacs |
| Tenure | 3 years |
| Status | Submitted on 2nd May 2022 |

|  |  |  |
| --- | --- | --- |
| **2.** | **Title:** | High Energy Density Net-Zero building |
| Name of the Scheme: | Call for Ignition Grants (IG-II) : -  Technology-based Energy Solutions: Innovations for Net Zero |
| Funding agency | Department Of Science & Technology |
| Role | Principal Investigator |
| Other member: | Prof. Subhashish Bhattacharya ( Professor-North Carolina State University, USA)  Mr. Jayanta Paul (Manager, Planning – CESC Limited)  Mr. Rakesh Naskar (Director-SARN Solar Solutions Private Limited) |
| Cost | 1,99,88,000 |
| Tenure | 2 years |
| Status | Submitted on 15th March, 2022 |

**Book: To be published:**

|  |  |  |
| --- | --- | --- |
| **3.** | **Title:** | Design & Development of Noble high energy & power density UCAV |
| Name of the Scheme: | Scientific and Useful Profound Research Advancement (SUPRA) |
| Funding agency | Scientific and Engineering Research Board |
| Role | Principal and Investigator |
| Other member: | Prof. Sharmili Das ( Co-PI)  Prof. Yogesh Vijay Hote (Co-PI)  Prof. Debashis Ghosh (Co-PI) |
| Cost | 4,86,48,000 |
| Tenure | 3 years |
| Status | \* |

**\*-yet to be confirmed**

|  |  |  |
| --- | --- | --- |
| **1.** | **Title:** | ***Introduction to FACTS Devices*** |
| **Publishing Agency** | CRC Press/Taylor and Francis Group |
| Targeted reader  Pagency | 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 |