Dr.Subhendu Bikash Santra

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Academic Profile

Jadavpur University — Kolkata, W.B, India
Doctor of Philosophy (Ph.D) in Electrical Engineering — *June. 2019 – Feb. 2023*
Area: Non-Isolated Bidirectional DC-DC Converter (Power Electronics)

Jadavpur University — Kolkata, W.B, India
Master of Engineering (M.E) in Electrical Engineering — *July. 2010 – May 2012*
Specialization: Machine and Drive
GPA: 8.94/10, Percentage: 83.33%

West Bengal University of Technology Now MAKAUT — Kolkata, W.B, India
Bachelor of Technology (B.Tech) in Electrical Engineering — *Aug. 2006 – May 2010*
Haldia Institute of Technology| GPA: 8.29/10, Percentage: 75.04%

Vidyasagar Vidyapith Higher Secondary School — W.B.C.H.S.E, W.B
Higher Secondary — *2006*
Specialization: Science
Percentage: 76.50%

Kuapur High School — W.B.B.S.E, W.B
Secondary — *2004*
Percentage: 83.33%

Teaching and Industrial Experience

Assistant Professor — Jan 2024 – Present
Department of Electrical Engineering-Shiv Nadar Institution of Eminence-DU — *Dadri,NCR Delhi, India*

- **Course Taught:** Electric Drives, Measurement and Instruments, EV Converter and Power Train, Advanced Power Electronics.

Assistant Professor — July 2015 – Dec 2023
School of Electrical Engineering-KIIT Deemed to be University — *Bhubanesar, Odisha, India*

- **Course Taught:** AC Machine, Power Electronics, Network Analysis,Analog Electronics Circuits, Digital System Design Using FPGA, SMPS and PWM Converter.
- Course Coordinator of M.Tech Power Electronics and Drives Specialization.
- **Coordinator for Energy and Control Research Group:** PV system, DC-DC Topological Development, Microgrid Control.

Engineer — June. 2014 – June. 2015
Rail Vikas Nigam Limited (RVNL)-Schedule A PSU under Govt. of India — *New Delhi, India*

- Performed drawing checking for E M division in Metro Railway Project, Designing Lightning Protection, *Traction Bonding, Earth Mat Design, and Platform lightning design.*
- BOQ management (project), Traction Bonding, PNI and NI work
- Utility Detection and Diversion, *Fire protection (NFPA 72), Earth Mat Design (IEEE 80:2000) by ETAP (FEM method). (IS3043), Building Lighting Protection Design. (IEC: 62305).*

Institute Research Scholar — June 2013 – March 2014
IIT Kharagpur — *Kharagpur, W.B, India*

- **Lab TA:** Power Electronics

Assistant Professor — July 2012 – April 2013
Camellia Institute of Technology — *Madhyamgram, W.B, India*

- **Course Taught:** AC Machine,Power Electronics, Circuit Theory

Research Experience

PhD Thesis | *Area: DC-DC Power Converter* June 2019 – Feb 2023
Title: Design and Development of Improved Topologies for Microgrid Connected Bidirectional Converter with Energy Storage.| **Supervisor**: Prof. (Dr.) Debashis Chatterjee|Professor, EE Dept, JU-kolkata

- Developed a new topology of non-isolated bidirectional DC-DC converter using coupled Inductor
- Proposed a new method of capacitor section in Photovoltaic (PV) energy conversion system for ensuring Maximum power point tracking
- Proposed GaN-FET driver for achieving fast transient response with greater immunity to false triggering of switch due to high dv/dt
- Proposed a generalized DC-DC converter circuit development method using coupled for switch current stress minimization
- Proposed a resonant DC-DC converter which has higher efficiency and has zero input current ripple

M.E Thesis | *Area: Machine and Drive* May 2010 – May 2012
Title: Design and Implementation of UPFC based Boost Converter for Efficiency Optimization of Brushless DC Motor Drive System.**Supervisor**: Prof. (Dr.) Debashis Chatterjee|Professor, EE Dept, JU-kolkata

- Developed UPFC AC-DC front end converter using UC-3854 for BLDC Motor Drive
- Analyzed harmonics current effect on efficiency of trapizoidal BLDC motor drive
- Proposed SHE based control scheme for efficiency improvement of BLDC motor drive
- Also worked on fuzzy logic based control using current harmonics information forefficiency improvement of BLDC motor drive.

B.Tech Project | *Area: Electrical Engineering* May 2009 – May 2010
Project-2:FACTS Controller Design for reactive power compensation in transmission line

- In this group project I made a simulation file (MATLAB-2010) which shows a flat voltage profile and increase in power transfer capability of transmission line using FACTS devices.

Project-1:Automatic night lamp with morning alarm using 555 timer

Awards, Funded Project and TA/RA

Industry Award|*Metro Railway Project* Nov-2014

- Outstanding work for utility detection and shifting for JOKA-BBD Bag Metro Project (A Project of **Rail Vikas Nigam Limited –A PSU under ministry of Railways Govt. of India.**
- **DST-SERB Project-Govt. of India**|*SERB-TARE-2022-18.3 Lakhs* Dec-2021-Dec-2024
  - Research Grant from DST-GOI (TARE fellow: Title: **Development of GaN-FET Based high efficiency Bidirectional DC-DC Converter with zero input current ripple for PV application.**
  - **DST-GITA-India-Taiwan Joint Project**|*DST-GITA-2022-24.15 Lakhs-Under Review*
    - Research Grant from DST-GITA (Title: **Three port high gain power converter for sustainable energy system.**
  - **TA/RA**|*Scholarship, Awards*
    - Worked as an Institute Research Scholar in **IIT Kharagpur** 2013
    - **MHRD Scholarship** during M.E in **Jadavpur University**, Kolkata, India. 98 percentile in GATE-2010, 99.8 in GATE-2013 (**AIR-748**) and 99.9 (**AIR-533**) percentile in GATE-2014.
    - Got **GOLD medal** for highest mark in Madhyamik Examination in 10th std. in West Bengal, India.
    - Specialization topper of Machine and Drive-M.E
    - SERB TARE Research Fellow-2022-Govt. of India

Area of Interest and Technical Skills

Area of Interest|*DC-DC Converter, Control of Power Converter, BLDC Motor Drive* June 2016-Present

Languages: Basic C, VHDL, Assembly C, LABVIEW
Simulation: MATLAB, PSIM, PLECES, SIMTRIX
PCB Design: Altium Design Suite

Mentoring/Guide

Previous Student (M.Tech): Subhalakshmi Jena, Sameer Kumar Behera, Mukesh Kumar Sahu, Sayantan Mondal, Md. Aftab Alam, Aratrika Roy,Babatunde Tolu Ogungbe.
Previous Student: (B.Tech): Aritra Ghosh, Sukanya Dutta, Sk.Nasim Parvez, Subhoshree Sarangi, Anindya Das.

Professional Membership and Editorial Activities

IEEE, IEI (India): Senior Member of IEEE, IES Society Member, Member of Institute of Engineers (India)
IEEE IES Student Branch Chapter Advisor/Counsellor: Various Student Activities,Best Student Branch Chapter Award-2018 under IES
Associate Editor-International Journal of Power Electronics (Inderscience): Editoral board member of Scopus indexed reputed Journal in the field for power electronics
Reviewer of IEEE Transactions on Power Electronics, IEEE Transactions on Industrial Electronics, IEEE Journal of Emerging and Selected Topics in Power Electronics, IET Power Electronics, IEEE Transactions on Vehicular Technology, IEEE Access Journal etc.

Publication

Journal July 2016 – Present
SCI/SCIE Indexed *IEEE/IET/Springer Etc.*

- "Coupled Inductor based Soft Switched High Gain Bidirectional DC-DC Converter with Reduced Input Current Ripple", **Subhendu Bikash Santra**, Debashis Chatterjee,Yam.P.Siwakoti.***IEEE Transctions on Industrial Electronics*** vol. 70, no. 2, pp. 1431-1443, July 2022 (I.F-8.2)—2022. |**First and Corresponding Author**

- "Constant Frequency CC-CV Operation of Isolated LLC Resonant DC-DC Converter Using Switched Capacitor Network for WCS",Kirshan Kumar Gautam, Amitabh Chatterjee, **Subhendu Bikash Santra**, Dinkar Prasad ***IEEE Transctions on Power Electronics*** Sept 2024 (Early Access) |**Coauthor**

- "Analysis of Cogging Torque in a Series Hybrid Variable Flux Machine for EV using Lumped Magnetic Circuit",Dwaipayan Barman,**Subhendu Bikash Santra**, Pragasen Pillay***IEEE Transctions on Power Electronics*** Sept 2025 (Early Access) |**Corresponding Author**

- "Cogging Torque Computation in an Asymmetrical Interior Permanent Magnet Machine for Electric Vehicles",Dwaipayan Barman, **Subhendu Bikash Santra**, Debashis Chatterjee, Rakesh Palisetty, Pragasen Pillay***IEEE Journal of Emerging and Selected Topics in Industrial Electronics*** Sept 2024 (Early Access) |**Corresponding Author**

- "Sector Wise Modified Droop Control to Improve Voltage Regulation and Current Sharing in Parallel Boost Converter Interfaced DC Microgrid,"M. Ramana, **Subhendu Bikash Santra**, D. Chatterjee and Y. P. Siwakoti, in ***IEEE Journal of Emerging and Selected Topics in Power Electronics***,Oct 2024 (Early Access) |**Corresponding author**

- "Size Optimized Load Independent Constant Current and Constant Voltage Wireless Charging System for EVs",Kirshan Kumar Gautam, Amitabh Chatterjee, **Subhendu Bikash Santra**, Dinkar Prasad ***IEEE Journal of Emerging and Selected Topics in Industrial Electronics*** Sept 2025 (Accepted in Press) |**Coauthor**

- "Simplified circuit model of novel bypass diode based PV array for circulating current and power loss minimization under partial shading" **Subhendu Bikash Santra**, Subodh Kumar Mohanty, Tanmoy Roy Choudhury ***COMPEL-The international journal for computation and mathematics in electrical and electronic engineering*** (Emerald Publishing Limited). Vol.44, No. 1, pp. 1-18, Feb.2025.(I.F-0.69) |**First and Corresponding Author**

- "High Efficiency Operation of Brushless DC Motor Drive using Optimized Harmonic Minimization based Switching Technique", **Subhendu Bikash Santra**, Arunava Chatterjee,Debashis Chatterjee,P. Sanjeevikumar, Krishnatreya Bhattacharya.***IEEE Transctions on Industrial Applications*** vol. 58, no. 2, pp. 2122-2133, Feb 2022 (I.F-4.65)—2022. |**First and Corresponding Author**

- "Performance Analysis of Novel Bidirectional DC-DC Converter with LD Based Modified GaN-FET DriverHigh Gain and High Efficiency Bidirectional DC-DC Converter", **Subhendu Bikash Santra**, Makireddi Ramana, Debashis Chatterjee.***IEEE Transctions on Industry Applications*** vol. 57, no. 5, pp. 5199-5214, July 2021 (I.F-4.6)—2021. |**First and Corresponding Author**

- "High Gain and High Efficiency Bidirectional DC-DC Converter with Current Sharing Characteristics Using Coupled Inductor.", **Subhendu Bikash Santra**, Debashis Chatterjee,Tsorng-Juu Liang.***IEEE Transctions on Power Electronics*** vol. 36, no. 11, pp. 12819-12833, Nov. 2021 (I.F-6.37)—2021. |**First and Corresponding Author**

- "Selection of capacitor in PV system suitable for maximum power point tracking", **Subhendu Bikash Santra**, Debashis Chatterjee, Kundan Kumar, Manuele Bertoluzzo, Ariya Sangwongwanich, Frede Blaabjerg.***IEEE Journal of Emerging and Selected Topics in Power Electronics*** vol. 9, no. 2, pp. 2136-2146, April 2021, doi: 10.1109/JESTPE.2020.2986858. (I.F-5.4) |**First and Corresponding Author**

- "Generalized Switch Current Stress Reduction Technique for Coupled-Inductor based Single Switch High Step-Up Boost Converter", **Subhendu Bikash Santra**, Debashis Chatterjee, Yam P Siwakoti, Frede Blaabjerg. ***IEEE Journal of Emerging and Selected Topics in Power Electronics*** vol. 9, no. 2, pp. 1863-1875, April 2021, doi:10.1109/JESTPE.2020.2998487.(I.F-5.4) |**First and Corresponding Author**

- "Simplified Prediction Based AI-IoT Model for Energy Management Scheme in Standalone PV Powered Greenhouse", S. R. Biswal, T. R. Choudhury,**Subhendu Bikash Santra**, B. Panda, S. Mishra and S. Padmanaban. ***IEEE Journal of Emerging and Selected Topics in Industrial Electronics*** Early Access 2024.doi:10.1109/JESTIE.2024.3425670. |**Coauthor**

- "Performance Improvement of DC-DC Converter Using L-D Based Modified GaN-FET Driver", **Subhendu Bikash Santra**, Aratrika Roy, Tanmoy Roy Choudhury, Debashis Chatterjee, Byamakesh Nayak.***International Journal of Circuit Theory and Application-Wiley Publication***, Vol.48, No. 6, pp. 860-873, April.2020.(I.F-2.1) |**First and Corresponding Author**

- "An improved selective harmonics elimination technique for PV assisted single phase grid-tied PWM inverter", **Subhendu Bikash Santra**, Subodh Kumar Mohanty. ***COMPEL-The international journal for computation and mathematics in electrical and electronic engineering*** (Emerald Publishing Limited). Vol.39, No. 2, pp. 379-394, Jan.2020.(I.F-0.69) |**First and Corresponding Author**

- "A Modified Carrier based PWM Technique for Minimization of Leakage Current in Transformer Less Single Phase Grid Tied PV System", **Subhendu Bikash Santra**, Anupam Achrya, Tanmoy Roy Choudhury, Byamakesh Nayak, Chinmoy Kumar Panigrahi. ***Electrical Engineering****(Springer).* Vol. 103, no.1, pp.447-461, Feb. 2021,https://doi.org/10.100 020-01092-6. (I.F-2.18) |**First and Corresponding Author**

- "A Novel Switch Current Stress Reduction Technique for Single Switch Boost- Fly-back Integrated High Step Up DC-DC Converter", Tanmoy Roy Choudhury, B.K.Nayak, **Subhendu Bikash Santra**, ***IEEE Transaction in Industrial Electronics***, Vol.66, no.9, pp.6876-6886, Nov.2018. (I.F-7.7) |**Coauthor-3rd**

- "Performance analysis of a three-phase propulsion inverter for electric vehicles using GaN semiconductor devices", Tanmoy Roy Choudhury, K. Kumar, **Subhendu Bikash Santra**, ***IEEE Transactions on Industrial Applications***, Vol.54, no.6, pp.6247-6257, Aug.2018.(I.F-4.4) |**Coauthor-2nd**

- "Isolated soft-switched boost DC–DC converter with low-voltage stress and high step-up ratio",**Subhendu Bikash Santra**, K.Kumar, S.Mohapatra, Debashis Chatterjee ***IET The Journal of Engineering***, Vol.2018, no.5, pp.316-322, July.2018. |**First and Corresponding Author**

- "Lyapunov based fast terminal sliding mode QV control of grid connected hybrid solar PV and wind system",**Subhendu Bikash Santra**, K.Kumar, P.Biswal, C.K.Panigrahi **IEEE** ***Access***, Vol.2018, no.6, pp.39139-39153, June.2018. |**First and Corresponding Author**

- "Fuzzy logic-based loss minimisation scheme for brushless DC motor drive system", Tridibesh Nag,**Subhendu Bikash Santra**, A. Chatterjee, Debashis Chatterjee, Ashoke K Ganguli **IET** ***Power Electronics***, Vol.9, no.8, pp.1581-1589, June.2016. |**Coauthor**

- "Voltage stress analysis of a single switch high boost converter with mixed CCM-DCM mode useful for snubber design", T. Roy Choudhury, Byamakesh Nayak,**Subhendu Bikash Santra**, **Wiley** ***International Journal of Circuit Theory and Application***, Vol.46, no.11, pp.2098-2117, Nov.2018. |**Coauthor**

- "Review of active power control techniques considering the impact of MPPT and FPPT during high PV penetration",G.C. Mahato, S.R.Biswal, T. R.Choudhury, B. Nayak,**Subhendu Bikash Santra**, **Elsevier *Solar Energy***, Vol.251, pp.404-419, Feb.2023. |**Coauthor**

- "Faulty Phase Identification and Ground Detection in TCSC Compensated Lines Integrated with Wind Farms", S.Mohanty,**Subhendu Bikash Santra**, **Elsevier *International Journal of Electrical Power and Energy System*** , Accepted in Press, July.2023. |**Coauthor**

- "Investigation of voltage stress on a single switch boost-fly-back integrated high gain converter with light load condition", T. Roy Choudhury, Byamakesh Nayak,**Subhendu Bikash Santra**, **Elsevier *Ain Shams Engineering Journal***, Vol.10, no.1, pp.217-226, March.2019. |**Coauthor**

- "Loss minimisation of trapezoidal BLDCM drive by UPFC-based optimal switched inverter", **Subhendu Bikash Santra**, ***International Journal of Power Electronics***, Vol. 10, no.3, pp. 266-288, June 2019 Inderscience Publishers-**Scopus Indexed**|**Sole-author**

- "Analysis and design of novel non-isolated quadratic boost DC-DC converter", **Subhendu Bikash Santra**,T. Roy Choudhury, S.K. Mohanty, Debashis Chatterjee ***International Journal of Power Electronics***, Vol. 11, no.4, pp. 427-459, March 2020 Inderscience Publishers-**Scopus Indexed**|**First and Corresponding Author**

International Conference July 2016 – Present

Web of Science indexed Proceedings *IEEE*

- "Reverse Conduction Loss and dv/dt Induced False Triggering Protection of GaN-HFET Based Power Converter for EV Charging", **Subhendu Bikash Santra**, Kishan Kumar Gautam, Dinkar Prasad, Debashis Chatterjee, 2024 IEEE International conference on "Power Electronics, Drives and Renewable Energy (**PEDES 2024**) NIT Surathkal, Mangalore, India, 20-24 December 2024.

- "Performance Improvement of PV Array by Minimizing Circulating Current through Modified Bypass Arrangement in Partial Shaded Condition" Subhashree Sarangi, **Subhendu Bikash Santra**, Sanjeet Kumar Dwibedi, Debashis Chatterjee, IEEE International conference on "Power Electronics, Smart Grid and Renewable Energy (**PESGRE 2020**) Cochin, Kerala, India, 2-4 January 2020.

- "Design of Bootstrap Capacitor Based GaN-FET driver for Improvement in Transient Performance of DC-DC Converter", **Subhendu Bikash Santra**, Aratrika Roy, Debashis Chatterjee, IEEE International conference on "Power Electronics, Smart Grid and Renewable Energy (**PESGRE 2020**) Cochin, Kerala, India, 2-4 January 2020.

- "Torque Ripple and Loss Minimization of Trapezoidal Brushless DC Motor Drive by Harmonics Current Excitation Switching Technique", K. Bhattcharyya, **Subhendu Bikash Santra**,Debashis Chatterjee, Sanjeevikumar. P, IEEE International conference on "Power Electronics, Smart Grid and Renewable Energy (**PESGRE 2020**) Cochin, Kerala, India, 2-4 January 2020.

- "Selection of Optimal Capacitor value of PV System for Maximum Power Point Tracking" **Subhendu Bikash Santra**, Debashis Chatterjee, Shobhan Banerjee Kundan Kumar, Manuele Bertoluzzo. **2018 IEEE International Conference on Power Electronics, Drives and Energy Systems** (**PEDES-2018**), **IIT-Madras**, India, Dec-2018.

- "Generation of PWM Schemes for Power Electronic Converters", **Subhendu Bikash Santra**, K Bhattcharya, Tanmoy Roy Choudhury, Debashis Chatterjee, **2018 20th National Power Systems Conference (NPSC-2018)**, **NIT-Trichy**, India, Dec-2018.

- "Current Mirror Curcuit Based Low Cost Lead Acid Battery Charger for Solar PV", Nasim Parvez, Anindya Das, **Subhendu Bikash Santra**. **2018 8th IEEE India International Conference on Power Electronics (IICPE-2018)** MNIT Jaipur, India, Dec-2018.

- "Non Symmetrical Ground Grid Design Technique for Elevated Metro Station-A Case Study", **Subhendu Bikash Santra**, Sukanya Dutta,kundan kumar, Debashis Chatterjee,**14th IEEE India Council International Conference 2017 (INDICON-2017)** at IIT Roorkee, India, Dec-2017.

- "Stability analysis and control of hybrid solar and wind system through NI C-RIO", **Subhendu Bikash Santra**, Sameer Kumar Behera, C.K.Panigrahi, **2016 IEEE 7th India International Conference on Power Electronics (IICPE-2016)** ISBN: 978-1-5090-4530-3/16/.

- "Design of a Novel Non-Isolated Boost Converter for Renewable Energy System." **Subhendu Bikash Santra** , Mukesh Kumar Sahu, Debashis Chatterjee, **2016 IEEE 7th India International Conference on Power Electronics (IICPE-2016)** ISBN: 978-1-5090-4530-3/16/.

Personal Information

Date of Birth: 29/01/1989 | Male | Subhendu Bikash Santra | General
Marital Status: Married |**Address**: Vill: Gobindapur PO: Chandrakona Town Dist:Paschim Midnapur, W.B, India, Pin:721201, Mob: 8100334747

Declaration

I declare that the above information is correct to the best of my knowledge and I bear the responsibility for the correctness of the above-mentioned particulars

Gautam Buddha Nagar,NCR, Delhi*India*|*23.05.2025* Dr.Subhendu Bikash Santra