

Dr. SOUMYA RANJAN BISWAL

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Education:

Executive Master of Technology in Artificial Intelligence & Data Science, IIT Patna, 2026-2028 (Pursuing)

Ph.D. in Electrical Engineering, KIIT Deemed to be University (NIRF: 17), 2025 | CGPA: 9.0/10

Thesis title: "Analysis and Implementation of ML Driven DSM for Optimized Energy Consumption in a Grid Connected Smart Greenhouse".

Master of Technology in Power Electronics and Drives, IGIT, Sarang, 2017 | CGPA: 8.2/10

Thesis: "Design and analysis of a high-efficiency interleaved boost converter with soft switching capability for renewable energy applications".

Bachelor of Technology in Electrical and Electronics Engineering, BPUT, Odisha, 2014 | CGPA: 7.2/10

Project: "Solar wind hybrid system for rural electrification".

Research Interests:

AI-driven IoT systems for intelligent energy management, predictive modeling, and demand side optimization with applications in smart grids, smart agriculture, and Industry 4.0 ecosystems.

Professional Experience:

Assistant Professor, Department of Artificial Intelligence & Data Science, SIT College of Engineering, Kolhapur, Maharashtra (June 2025 - Cont.)

Teaching courses in Internet of Things (IoT), Artificial Intelligence and Machine Learning.

Guiding undergraduate students in end-to-end projects focused on IoT and data driven applications.

Lecturer (2 years), Odisha Institute of Engineering and Technology (OIET), Dhenkanal (2017-19)

Taught Measurement, Network Theory, and Power Electronics.

Guided students in project development related to IoT, smart grids.

Teaching Assistant (2 years), Indira Gandhi Institute of Technology (IGIT), Sarang (2015-17)

Conducted laboratory sessions for Basic Electrical and Electronics and Measurement.

Teaching Assistant (4.5 years), KIIT Deemed to be University (2020-2025)

Conducted laboratory sessions IoT, Measurement, Network Theory, and Basic Electrical and Electronics.

Organized IoT workshops and laboratory sessions for practical implementation

Publications:

Journal Papers:

1. **S. R. Biswal, et al.**, 2025. "Simplified Prediction-Based AI-IoT Model for Energy Management Scheme in Standalone PV Powered Greenhouse." *IEEE Journal of Emerging and Selected Topics in Industrial Electronics*, 6(1):224-237. doi:10.1109/JESTIE.2024.3425670. **(SCI, Impact Factor: 4)**
2. **S. R. Biswal, et al.**, "An Improved IoT Based Hybrid Predictive Load Forecasting Model for a Greenhouse Integrated with Demand Side Management," in *IEEE Access*, vol. 13, pp. 108446-108465, 2025, doi: 10.1109/ACCESS.2025.3579435. **(SCI, Impact Factor: 3.6)**

3. **S. R. Biswal, et al.**, “AI-Enabled Energy Management for Sustainable Smart Greenhouses: An Integrated Review,” in *IEEE Access*, vol. 14, pp. 5482-5509, 2026, doi: 10.1109/ACCESS.2026.3651685. (**SCI, Impact Factor: 3.6**)
4. G. C. Mahato, **S. R. Biswal**, T. R. Choudhury, B. Nayak and S. B. Santra, 2023. “Review of active power control techniques considering the impact of MPPT and FPPT during high PV penetration,” in *Solar Energy*, 251:404-419. doi.org/10.1016/j.solener.2023.01.035. (**SCI, Impact Factor: 6.6**).

Conference Papers:

1. **S. R. Biswal, et al.**, “TA-LSTM and IoT Based Energy Management for PV-Powered Greenhouses,” 2025 4th IEEE Industrial Electronics Society Annual On-Line Conference (ONCON), Kharagpur, India, 2025.
2. **S. R. Biswal, et al.**, “Optimal Battery Utilization Based on Weather Forecasting Data Leading to DSI,” 2022 1st IEEE International Conference on Industrial Electronics: Developments & Applications (ICIDeA), Bhubaneswar, India, 2022:192-197.
3. **S. R. Biswal et al.** “Demand Side Integration Concept Development through a Smart Meter using LabView,” 2021 IEEE International Women in Engineering (WIE) Conference on Electrical and Computer Engineering (WIECON-ECE), Dhaka, Bangladesh, 2021:149-153.
4. **S. R. Biswal, et al.**, “Smart Meter: Impact and Usefulness on Smart Grids,” 2021 IEEE 2nd International Conference on Applied Electromagnetics, Signal Processing & Communication (AESPC), BBSR, India, 2021: 1-6.
5. G. C. Mahato, T. R. Choudhury, B. Nayak, **S. R. Biswal** and R. Dash, “Sensorless FPPT Tracking Mechanism based on Forecasting Data,” 2022 1st IEEE International Conference on Industrial Electronics: Developments & Applications (ICIDeA), Bhubaneswar, India, 2022, 187-191.
6. G. C. Mahato, T. R. Choudhury, B. Nayak and **S. R. Biswal**, “A Novel Approach to Implement FPPT Considering Load side Coordination Control,” 2022 IEEE International Conference on Power Electronics, Smart Grid, and Renewable Energy (PESGRE), Trivandrum, India, 2022:1-6.

Patents:

1. An Optimal Solar Power Management System for a Smart Greenhouse Arrangement (Published, Application No: 202331015513)
2. A sustainable bird repelling device for agriculture sector with advanced decision-making mechanism. (Published, Application No:202331015511)
3. Priority-based solar power management controller for sustainable greenhouse farming. (Published, Application No:202431087402)

Abstracts in seminar/ conferences/ workshop:

1. S. Mishra, **S. R. Biswal**, et al., 2024. Integrating AI-IoT with LED based hydroponics system for resilient cultivation of strawberry, spinach and lettuce. International conference on building small holder climate resilience for achieving sustainable food systems at OUAT, BBSR. 354-355.

Short notes & popular article:

1. **S. R. Biswal**. 2024. Smart Farming: Internet of Things (IoT)-based sustainable agriculture. SOA Agri-confluence-2024. 109-110.
2. **S. R. Biswal** et al., 2024. AI for Food Justice: Bridging the Gap Between Agriculture and the Right to Food. National Symposium on Artificial Intelligence and the Right to Food: Advancing Agriculture for a Better Future & a Better Life in occasion of “World Food Day”. 88-94.
3. Mishra S., **S. R. Biswal**, Jaiswal K. and Biswal B. C. 2024. Sensor Technologies for Climate-Smart Fruit Crop Management: An Odisha Prospective. Odisha Climate Change Conclave-2024, 48-50.

Book & Book chapters:

1. S. Mishra, **S. R. Biswal** and Dash D.K. Novel Technologies on Preservation of Fruits and Vegetables. In book “*Advances in Agriculture Sciences*” Volume 5, AkiNik Publications: 17-52

Projects:

Internal University Funded Project:

1. AI-IoT Model for Smart Greenhouse Energy Management, Centre of excellence horticulture, Odisha
Developed a sensor less energy management system for standalone PV-powered greenhouses, leveraging IoT and machine learning to optimize energy usage and reduce operational costs.

Key Results: Achieved a 42.96% reduction in costs and a 63.27% reduction in storage capacity requirements.

External funding Projects:

1. Research proposal submitted to the Indian Council of Social Science Research (ICSSR) under the Research Programme for Major/Minor Research Projects (2025–26); Status: under review.
2. AI based Low-cost Solar powered robotic recycling system for reusable E-waste components. MSME 4.0, 2024, Govt. of India, in 3rd stage.
3. *IoT-Based Smart Irrigation System for Hydroponic Farming*, submitted to **YUKTI-National Innovation Repository**. Status: Recommended in the First Stage of Evaluation (Innovation ID: IR2022-821856)

Teaching Interests and Competencies:

Internet of Things (IoT), Measurement, Machine Learning, & Deep Learning, Python, Power Electronics, Network Theory

Technical Skills:

1. IoT Platforms: Arduino, Raspberry Pi, STM32, ESP32
2. Communication Protocols: LoRa, Zigbee, Wi-Fi, MQTT, TCP/IP
3. Machine Learning Tools: TensorFlow, Scikit-learn
4. Tools & Software: LabVIEW, Python, Arduino

Key Roles & Contributions:

1. Training & Placement Coordinator - leading departmental training programs, industry collaborations activities.
2. R&D Coordinator - coordinating departmental research activities, fostering innovation and students in research and project development.
3. NBA Accreditation (Criteria 6) Coordinator - managing governance, institutional support, and compliance for accreditation processes.
4. Reviewer: IEEE Journal and Conference Paper Reviewer
5. Speaker: G-20, 3rd Education Group Meeting Workshop (Academia representative)
6. Volunteer, Organizing Committees – STPEC 2023 and ICIDeA 2022, Managing technical sessions and delegate coordination.
7. Contributions as developer, content editor and author to the “Agriculture2u.com” community.

Awards & Achievements:

1. Best Poster Presentation Awarded at the Annual Research Summit, held at Kalinga Institute of Industrial Technology (KIIT), Bhubaneswar, Odisha (March 7-8, 2025).

2. Best Volunteer Award in IEEE Conference “3rd International Conference on Smart Technologies for Power, Energy and Control (STPEC 2023)” organized by KIIT DU on 10-13 Dec 2023.
3. Best Paper Award, IEEE Conference ICIDeA 2022: “Optimal Battery Utilization Based on Weather Forecasting Data Leading to DSI” organized by IEEE Kolkata Section Industrial Electronics Society Chapter Bhubaneswar and IEEE Bhubaneswar Subsection Oct 2022.
4. Best Volunteer Award in IEEE Conference “1st IEEE International Conference on Industrial Electronics: Developments & Applications (ICIDeA 2022)” organized by organized by IEEE Kolkata Section Industrial Electronics Society Chapter Bhubaneswar and IEEE Bhubaneswar Subsection Oct 2022.
5. Bagged AICTE PG Scholarship during M. Tech (2015-2017).
6. Qualified Graduate Aptitude Test in Engineering (GATE) 2015 with a score of 379.
7. Awarded 3rd prize in “World of Innovation” organized by GIET, 2014.
8. Awarded 2nd prize in model presentation on “Solar Wind Hybrid System Rural Electrification” organized by GIET, 2014.

Professional Memberships:

1. IEEE Student Member (Membership ID: 97732350).
2. International Society for Research and Development Member (Membership ID: SM3140905184)

Certifications Programmes:

1. Online certification, “Reinforcement Learning” from MathWorks
2. NPTEL online certification, “Data Science for Engineers” from Indian Institute of Technology, Madras, Duration: July-September 2024 (8 weeks).
3. Industrial Internship Program on “IoT with Machine Learning”, Organized by IEEE SB Chapter, NITK and PANTECH E-Learning, Duration: November 22-24, December 2021.
4. Summer Training Program on “IoT and Embedded PLC”, Organized by School of Electrical Engineering, KIIT Deemed to be University, Odisha, Duration: June 1-30, 2021.
5. AICTE Training and Learning (ATAL) Academy FDP on “Industrial Internet of Things Using LabVIEW” Organized by KLE Dr. M.S. Sheshgiri College of Engineering & Technology, Belagavi. Date: January 3-7, 2022.
6. AICTE Training and Learning (ATAL) Academy FDP on “Power Electronics Applications in Smart Grids and Electric Vehicles” (PEASE-2021) Organized by National Institute of Technology, Andhra Pradesh, Date: June 25-29, 2021.

Seminar, Conferences, workshop attended/presented:

1. Oral presentation on “TA-LSTM and IoT Based Energy Management for PV-Powered Greenhouses,” 2025 4th IEEE Industrial Electronics Society Annual On-Line Conference (ONCON), kharagpur, India, from 13th-15th Dec 2025.
2. Participated in GIAN course on “PV-Fuel Cell Microgrid: A Sustainable Energy Solution (PVFCMGSES-2024)”, organized by Department of Electrical Engineering, NIT Rourkela, from 26th-30th December 2024.
3. Participated in FDP on “Challenges and Development in Deregulated Electricity systems, Industrial Automation and Cyber Security”, organized by KIIT DU, Bhubaneswar in association with IEEE IAS, from 09th-13th April 2024.
4. Participated in Short-term Course and FDP on “Application of Machine Learning Technique in Sustainable Technology (AMLST-2024)” organized by Department of Computer Science Engineering and Electrical Engineering, NIT, Rourkela from 24th-28th January 2024.

5. Oral Presentation on “Connected Farming in the 21st Century” in International Conference on New Generation Horticulture for Prosperity, Organized by Orissa Horticulture Society and OUAT, BBSR on 20th and 21st Jan 2023.
6. Oral presentation on “Optimal Battery Utilization Based on Weather Forecasting Data Leading to DSI” in 1st IEEE International Conference on Industrial Electronics: Developments & Applications (ICIDeA2022) organized by IEEE Kolkata Section Industrial Electronics Society Chapter Bhubaneswar and IEEE Bhubaneswar Subsection on 15th 16th Oct 2022.
7. Participated in One Week National Level Workshop on “Python Programming” organized Department of Computer Science, Maharaja Sriram Chandra Bhanja Deo (MSCB) University from 20th-26th June 2022.
8. Workshop on “Ambient Intelligence: Adaptivity by using Artificial Intelligence, Machine Learning and Biometrics in Worldwide Cloud-based Environments” Organized by IEEE Power and Electronic Society Ill-JC SBC & IEEE Computer Society, BUBT SBC on 23rd March 2022.
9. Tutorial Session on “Possibilities of Using Smart Meters for Emergency Grid Management” Organized by IEEE Power and Electronic Society Ill-JC SBC & IEEE Computer Society, BUBT SBC on 25th March 2022.
10. Oral presentation on “Smart Meter: Impact and Usefulness on Smart Grids” in 2nd International Conference on Applied Electromagnetics, Signal Processing and Communication (AESPC 2021) organized by KIIT DU, BBSR from 26th-28th Nov 2021.
11. Hands on training on “IoT MATLAB and Things speak” organised by department of electronic and communication engineering SRM university, Andhra Pradesh held on 10th august 2021.
12. Participated in Five-Day Online Short-term Course on “Sustainable Power Systems” organized by Department of Electrical and Electronics Engineering, NIT, Tiruchirappalli in Association with the Hong Kong Polytechnic University from 7th-11th June 2021.

References:

1. **Dr. Tanmoy Roy Choudhury**, Department of Electrical Engineering, NIT Rourkela, Odisha, India, choudhuryt@nitrkl.ac.in.
2. **Dr. Subhendu Bikash Santra**, Department of Electrical Engineering, Shiv Nadar Institute of Eminence-DU, NCR Delhi, subhendu.santra@snu.edu.in.

Date: 03-01-2026

Place: Bhubaneswar, Odisha

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