LinkedIn Research gate Google Scholar GitHub

SOUMYA RANJAN BISWAL
Bhubaneswar, ODISHA, PIN-751024
mr.soumya5@gmail.com

A. Objective:

Aspiring to implement advancements in cutting-edge technology within smart energy management systems, with a focus on creating sustainable and efficient solutions for real-world challenges.

B. Education:

Ph. D. in Electrical Engineering
KIIT Deemed to be University, Ongoing

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

Master of Technology (M. Tech) in Power Electronics and Drives (PED)
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 (B. Tech) in Electrical and Electronics Engineering (EEE)
BPUT, Odisha, 2014 | CGPA: 7.2/10

- Project: Solar wind hybrid system for rural electrification

CHSE in Science, Bapujee college, Chhendipada, 2009 | Percentage: 58%
BSE, M.P.C. Academy, Sendha, 2007 | Percentage: 79%

C. Professional Experience: (8 Years)

Research Scholar, KIIT Deemed to be University (2020-24)

- Developed a predictive AI-IoT model for PV-powered greenhouses.
- Organized IoT workshops, conducted lab sessions in IoT, Measurement & Sensors

Lecturer, Odisha Institute of Engineering & Technology (OIET), Dhenkanal (2017-19)

- Taught Measurement, Network Theory, and Power Electronics.
- Guided students in project development related to IoT, smart grids.

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

- Conducted laboratory sessions for Basic Electrical and Electronics and Measurement.

D. Publications:

a. Journal Papers:

1. **S. R. Biswal**, T. R. Choudhury, S. B. Santra, B. Panda, S. Mishra and S. Padmanaban, 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.
2. **S. R. Biswal**, T. R. Choudhury, B. Panda, S. Mishra, "An Improved IoT based hybrid predictive load forecasting model for a Greenhouse integrated with Demand Side Management." *IEEE IEEE Access*.
3. 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.

b. Conference Papers:

1. **S. R. Biswal**, T. R. Choudhury, B. Panda, G. C. Mahato and N. Dash, "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. doi:10.1109/ICIDeA53933.2022.9970022.
2. **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, doi:10.1109/WIECON-ECE54711.2021.9829634.
3. **S. R. Biswal**, T. Roy Choudhury, B. Panda, B. Nayak and G. C. Mahato, "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, doi:10.1109/AESPC52704.2021.9708492.
4. 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, doi:10.1109/ICIDeA53933.2022.9970068.
5. 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, doi:10.1109/PESGRE52268.2022.9715850.

c. 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)

d. 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.

e. 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.

f. 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

E. Projects:

1. **AI-IoT Model for Smart Greenhouse Energy Management**

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.

2. **Smart Meter Development using ESP32**
   - Designed and implemented a smart meter using ESP32 for real-time energy monitoring and control.
3. **Battery Charging Scheduling**
   - Developed a system for battery charging scheduling using ThinkSpeak, enabling efficient energy management based on real-time data.
4. **External funding Projects:**
   - AI based Low-cost Solar powered robotic recycling system for reusable E-waste components. MSME 4.0, 2024, Govt. of India, in 3rd stage.
   - *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)

F. Technical Skills:

1. IoT Platforms: Arduino, Raspberry Pi, STM32, ESP32
2. Communication Protocols: LoRa, Zigbee, WiFi, Bluetooth
3. IoT Protocols Development: MQTT, TCP/IP, IEEE 802.15.4
4. Machine Learning Tools: TensorFlow, Scikit-learn
5. Tools & Software: LabVIEW, Python, Arduino

G. Key Roles & Contributions:

- Reviewer: IEEE Journal and Conference Paper Reviewer
- Speaker: G-20, 3rd Education Group Meeting Workshop (Academia representative)

Professional Memberships

- IEEE Member (Membership ID: 97732350).
- International Society for Research and Development Member (Membership ID: SM3140905184)
- Contributions as developer, content editor and author to the "Agriculture2u.com" community.

H. 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 on 15th 16th 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 on 15th 16th 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.

I. Certifications Programmes:

1. **NPTEL online certification**
   "Data Science for Engineers" from Indian Institute of Technology, Madras, Duration: July-September 2024 (8 weeks).

2. **Industrial Internship Program** on *"IoT with Machine Learning",* Organized by IEEE SB Chapter, NITK and PANTECH E-Learning, Duration: November 22-24, December 2021.
3. **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.
4. **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.
5. **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.

J. Seminar, Conferences, workshop attended/presented:

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.

10. 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
11. Participated in webinar on "Technical Tech-Talk series" conducted by IEEE Kolkata section Consumer Technology Society Chapter, BBSR on 9th July 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.
13. Attended the 7th International Conference on Soft Computing for Problem Solving (SocProS 2017) organized by IIT, BBSR from 23rd-24th Dec 2017.

Date: 25-04-2025 Soumya Ranjan Biswal

Place: Ichalkaranji, Maharashtra