

Subham Sahoo  
Associate Professor  
AAU Energy  
The Faculty of Engineering and Science  
Applied Power Electronic Systems  
Applied Power Electronic Systems  
Power Electronic Control, Reliability and System Optimization  
Reliability of Power Electronic Converters  
AI for the People  
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## Qualifications

Electrical Engineering, Ph.D., Coordinated Control of DC Microgrids, Indian Institute of Technology Delhi  
Award Date: 3 Nov 2018

## Employment

### Associate Professor

Associate Professor  
AAU Energy  
The Faculty of Engineering and Science  
Aalborg Øst, Denmark  
1 May 2019 → 31 Dec 4712

### Associate Professor

Associate Professor  
The Faculty of Engineering and Science  
Aalborg Øst, Denmark  
1 May 2019 → 31 Dec 4712

### Applied Power Electronic Systems

The Faculty of Engineering and Science  
Aalborg Øst, Denmark  
1 Jan 2021 → present

### Associate Professor

Associate Professor  
Applied Power Electronic Systems  
The Faculty of Engineering and Science  
Aalborg Øst, Denmark  
1 May 2019 → 31 Dec 4712

### Power Electronic Control, Reliability and System Optimization

The Faculty of Engineering and Science  
Aalborg Øst, Denmark  
1 Jan 2021 → present

### Reliability of Power Electronic Converters

The Faculty of Engineering and Science

Aalborg Øst, Denmark

1 Jan 2021 → present

### **AI for the People**

The Technical Faculty of IT and Design

Aalborg, Denmark

1 Oct 2024 → present

### **Chair**

IEEE Joint IES/IAS/PELS Chapter

Denmark

1 Jan 2025 → present

## **Research outputs**

### **Spike Talk: Genesis and Neural Coding Scheme Translations**

Sahoo, S., May 2025, In: I E E E Transactions on Smart Grid. 16, 3, p. 2659-2670 12 p., 10909727.

### **Uncertainty-Aware Artificial Intelligence for Gear Fault Diagnosis in Motor Drives**

Sahoo, S., Wang, H. & Blaabjerg, F., 2025, *2025 IEEE Applied Power Electronics Conference and Exposition (APEC)*. Atlanta, Georgie, US: IEEE (Institute of Electrical and Electronics Engineers), p. 912-918 7 p. 10977491. (Conference Proceedings - IEEE Applied Power Electronics Conference and Exposition - APEC).

### **Did you know energy possibly speaks?**

Sahoo, S., 21 Mar 2024, In: ScienceNordic.

### **Vidste du, at energi muligvis kan tale?**

Sahoo, S., 20 Mar 2024, In: Videnskab.dk [online].

### **Physics-informed neural network-based control of power electronic converters**

Sahoo, S., 1 Mar 2024, *Control of Power Electronic Converters and Systems: Volume 4*. Blaabjerg, F. (ed.). Academic Press, Vol. 4. p. 309-331 23 p.

### **Data-Driven Controllability of Power Electronics Under Boundary Conditions: A Physics-Informed Neural Network Based Approach**

Sahoo, S. & Blaabjerg, F., Mar 2023, *Proceedings of the 2023 IEEE Applied Power Electronics Conference and Exposition (APEC)*. IEEE (Institute of Electrical and Electronics Engineers), p. 2801-2806 6 p. 10131654. (I E E E Applied Power Electronics Conference and Exposition. Conference Proceedings).

### **Cyber Security for Microgrids**

Sahoo, S. (Editor), Blaabjerg, F. (Editor) & Dragicevic, T. (Editor), Sept 2022, United Kingdom: Institution of Engineering and Technology (IET). 327 p. (IET Energy Engineering Series, Vol. 196).

### **Cybersecurity in future energy systems: outlooks and recommendations**

Sahoo, S., Mantooth, H. A. & Blaabjerg, F., 1 Jan 2022, *Cyber Security for Microgrids*. Institution of Engineering and Technology, p. 297-304 8 p.

### **Event-driven resiliency of microgrids against cyber attacks**

Sahoo, S. & Blaabjerg, F., 1 Jan 2022, *Cyber Security for Microgrids*. Institution of Engineering and Technology, p. 269-295 27 p.

### **Stealth cyber attacks in microgrids: detectability and observability**

Sahoo, S., Dragicevic, T. & Blaabjerg, F., 1 Jan 2022, *Cyber Security for Microgrids*. Institution of Engineering and Technology, p. 203-225 23 p.

**On the Explainability of Black Box Data-Driven Controllers for Power Electronic Converters**

Sahoo, S., Wang, H. & Blaabjerg, F., 16 Nov 2021, *2021 IEEE Energy Conversion Congress and Exposition (ECCE)*. IEEE (Institute of Electrical and Electronics Engineers), p. 1366-1372 (IEEE Energy Conversion Congress and Exposition).

**Cyber Security in Control of Grid-Tied Power Electronic Converters - Challenges and Vulnerabilities**

Sahoo, S., Dragicevic, T. & Blaabjerg, F., Oct 2021, In: *IEEE Journal of Emerging and Selected Topics in Power Electronics*. 9, 5, p. 5326 - 5340 15 p., 8901166.

**A Model-Free Predictive Controller for Networked Microgrids with Random Communication Delays**

Sahoo, S. & Blaabjerg, F., 21 Jul 2021, *2021 IEEE Applied Power Electronics Conference and Exposition (APEC)*. IEEE (Institute of Electrical and Electronics Engineers), p. 2667-2672 6 p. (IEEE Applied Power Electronics Conference and Exposition (APEC)).

**A Localized Event Driven Resilient Mechanism for Cooperative Microgrid Against Data Integrity Attacks**

Sahoo, S. & Chih-Hsien Peng, J., Jul 2021, In: *IEEE Transactions on Systems, Man and Cybernetics, Part B: Cybernetics*. 51, 7, p. 3687-3698 12 p., 9098896.

**Multi-Layer Resilience Paradigm Against Cyber Attacks in DC Microgrids**

Sahoo, S., Dragicevic, T. & Blaabjerg, F., Mar 2021, In: *IEEE Transactions on Power Electronics*. 36, 3, p. 2522-2532 11 p., 9158562.

**Resilient Synchronization Strategy for AC Microgrids Under Cyber Attacks**

Sahoo, S., Yang, Y. & Blaabjerg, F., Jan 2021, In: *IEEE Transactions on Power Electronics*. 36, 1, p. 73-77 5 p., 9127110.

**Cyber security in power electronic systems**

Sahoo, S., 2021, *Control of Power Electronic Converters and Systems*. Blaabjerg, F. (ed.). Academic Press, Vol. 3. p. 199-220 22 p.

**An Event-Driven Resilient Control Strategy for DC Microgrids**

Sahoo, S., Dragicevic, T. & Blaabjerg, F., Dec 2020, In: *IEEE Transactions on Power Electronics*. 35, 12, p. 13714-13724 11 p., 9095427.

**Resilient Operation of Heterogeneous Sources in Cooperative DC Microgrids**

Sahoo, S., Dragicevic, T. & Blaabjerg, F., Dec 2020, In: *IEEE Transactions on Power Electronics*. 35, 12, p. 12601-12605 5 p., 9082009.

**A Linear Regression Based Resilient Optimal Operation of AC Microgrids**

Sahoo, S., Rana, R., Molinas, M., Blaabjerg, F., Dragicevic, T. & Mishra, S., 9 Nov 2020, *2020 IEEE 11th International Symposium on Power Electronics for Distributed Generation Systems (PEDG)*. IEEE (Institute of Electrical and Electronics Engineers), p. 260-265 6 p. 9244379. (2020 IEEE 11th International Symposium on Power Electronics for Distributed Generation Systems, PEDG 2020).

**An Adaptive Backstepping Based Virtual Inertial Control Framework for DC Microgrids**

Sahoo, S., Blaabjerg, F. & Dragicevic, T., Nov 2020, *2020 IEEE 11th International Symposium on Power Electronics for Distributed Generation Systems (PEDG)*. IEEE (Institute of Electrical and Electronics Engineers), p. 85-90 6 p. 9244327. (IEEE International Symposium on Power Electronics for Distributed Generation Systems (PEDG) ).

**Adaptive Resilient Operation of Cooperative Grid-Forming Converters under Cyber Attacks**

Sahoo, S., Dragicevic, T., Yang, Y. & Blaabjerg, F., 13 Oct 2020, *2020 IEEE CyberPELS (CyberPELS)*. IEEE (Institute of Electrical and Electronics Engineers), p. 1-5 5 p. 9311543

**On Detection of False Data in Cooperative DC Microgrids—A Discordant Element Approach**

Sahoo, S., Chih-Hsien Peng, J., Devakumar, A., Mishra, S. & Dragicevic, T., Aug 2020, In: I E E E Transactions on Industrial Electronics. 67, 8, p. 6562-6571 10 p., 8825989.

**Distributed Screening of Hijacking Attacks in DC Microgrids**

Sahoo, S., Chih-Hsien Peng, J., Mishra, S. & Dragicevic, T., Jul 2020, In: I E E E Transactions on Power Electronics. 35, 7, p. 7574-7582 9 p., 8918297.

**A Local Voting Protocol Based Cooperative DC Community Microgrids**

Sahoo, S., Chih-Hsien Peng, J., Mishra, S. & Dragicevic, T., 2020, *Proceedings of the 3rd International Conference on DC Microgrids 2019*. Matsue, Japan: IEEE (Institute of Electrical and Electronics Engineers), p. 1-5 5 p. 9232822

**A Distributed Fixed-Time Secondary Controller for DC Microgrid Clusters**

Sahoo, S., Mishra, S., Fazeli, S., Li, F. & Dragicevic, T., Dec 2019, In: I E E E Transactions on Energy Conversion. 34, 4, p. 1997-2007 11 p., 8794747.

**A Stealth Cyber Attack Detection Strategy for DC Microgrids**

Sahoo, S., Mishra, S., Chih-Hsien Peng, J. & Dragicevic, T., Aug 2019, In: I E E E Transactions on Power Electronics. 34, 8, p. 8162 - 8174 13 p., 8526328.

**A Distributed Finite-Time Secondary Average Voltage Regulation and Current Sharing Controller for DC Microgrids**

Sahoo, S. & Mishra, S., Jan 2019, In: IEEE Transactions on Smart Grid. 10, 1, p. 282-292 11 p., 8006291.

**Improved mean variance mapping optimization for the travelling salesman problem**

Sahoo, S. & Erlich, I., 2015, *Computational Intelligence in Data Mining - Proceedings of the International Conference on CIDM 2014*. Behera, H. S., Mandal, J. K., Jain, L. C., Mohapatra, D. P. & Jain, L. C. (eds.). Springer, p. 67-75 9 p. (Smart Innovation, Systems and Technologies, Vol. 31).

**Activities****Neurons in our Brains vs ANN - How different are they?**

Sahoo, S. (Lecturer)  
6 Mar 2024

**Massachusetts Institute of Technology**

Sahoo, S. (Visiting researcher)  
1 Oct 2023 → 29 Mar 2024

**Towards More Reliable, Flexible and Secure Power Electronic Systems**

Sahoo, S. (Lecturer), Yang, Y. (Lecturer) & Wang, H. (Lecturer)  
18 Oct 2020

**DC Microgrids for Transportation Electrification: Applications, Design & Control and Cyber-Security**

Sahoo, S. (Lecturer)  
15 Mar 2020

**Prizes****Innovative Students Projects Award 2019 - Doctoral Level**

Sahoo, S. (Recipient), 2019

**Awards**

**PRISM: Probabilistic bio-plausible machine learning for deciphering hidden footprints in electrophysiology**

Sahoo, S. (PI), Moreno, A. (Col) & Frøstrup, S. (Project Coordinator)

Lundbeck Foundation: DKK150,000.00

01/06/2025 → 31/05/2026

## Projects

**ActRes: Agency for resilience – Making people and energy systems fit for climate change and crises**

Hellwig, R. T. (PI), dos Santos, L. F. (Project Participant), Berger, C. (Project Participant), Horvath, A.-S. (Project Participant), Horsbøl, A. (Project Participant), Vasquez, J. C. (Project Participant), Raftopoulos, M. (Project Participant), Yuan, M. (Project Participant), Rüdiger, M. (Project Participant), Sahoo, S. (Project Participant) & Guan, Y. (Project Participant)

01/09/2023 → 31/12/2025

**AI-Assisted Adaptive Control for Operation Optimization of Smart Inverters**

He, Y. (PI), Wang, H. (Supervisor) & Sahoo, S. (Supervisor)

01/03/2023 → 28/02/2026

**AI-Power: Artificial Intelligence for Next-Generation Power Electronics**

Blaabjerg, F. (PI), Wang, H. (CoPI), Sahoo, S. (Project Participant), Zhao, S. (Project Participant), Zhang, Y. (Project Participant), Novak, M. (Project Participant) & Frøstrup, S. (Project Coordinator)

Innovation Fund Denmark

01/09/2022 → 31/08/2027

**Condition Monitoring for Smart Power Electronic Converter Systems for Distributed Generation**

Ou, S. (PI), Blaabjerg, F. (Supervisor), Sangwongwanich, A. (Supervisor) & Sahoo, S. (Supervisor)

01/08/2022 → 31/07/2025

**Dynamic Stabilization of DC Microgrids Based on Model Predictive Control of Point-of-Load Converters**

Li, Y. (PI), Blaabjerg, F. (Supervisor), Sahoo, S. (Supervisor) & Dragicevic, T. (Supervisor)

01/03/2021 → 29/02/2024

**Next-uGrid: Guidelines for Next Generation Buildings as Future Scalable Virtual Management of MicroGrids**

Sahoo, S. (PI), Jensen, K. S. (Project Participant) & Frøstrup, S. (Project Coordinator)

Nordic Energy Research

18/01/2022 → 17/01/2024

**Modeling, Analysis and Suppression of Wide band Instability in Large Scale Power Systems with Single Phase and Three Phase VSCs**

Kong, R. (PI), Blaabjerg, F. (Supervisor) & Sahoo, S. (Supervisor)

01/03/2023 → 28/02/2026

**CyberPE: Power Sentinel - Safeguarding Future Power Grids**

Sahoo, S. (PI), Stegmann, L. (Project Participant), Damsgaard, S. B. (Project Participant) & Frøstrup, S. (Project Coordinator)

Innovation Fund Denmark

01/05/2024 → 30/04/2025

**Power Sentinel - Safeguarding Future Power Grids**

Song, Y. (PI) & Sahoo, S. (Project Participant)

Villum Foundation

01/10/2024 → 14/11/2025

**PRISM: Probabilistic bio-plausible machine learning for deciphering hidden footprints in electrophysiology**

Sahoo, S. (PI), Moreno, A. (Col) & Frøstrup, S. (Project Coordinator)

Lundbeck Foundation

01/06/2025 → 31/05/2026

**SMARTGYsum: SMART Green energy Systems and bUsiness Models**

Blaabjerg, F. (PI), Sahoo, S. (Project Participant), Sangwongwanich, A. (Project Participant), Ou, S. (Project Participant) & Frøstrup, S. (Project Coordinator)

European Commission

01/10/2021 → 01/07/2026

**STABILITY AND RELIABILITY VALIDATION OF A MICROGRID SYSTEM**

Song, Y. (PI), Blaabjerg, F. (Supervisor), Yang, Y. (Supervisor) & Sahoo, S. (Supervisor)

01/06/2020 → 31/05/2023

**SAFEr Grid: Store-And-Forward Energy Grid**

Blaabjerg, F. (PI), Sahoo, S. (Col) & Frøstrup, S. (Project Coordinator)

HORIZON-ERC-SYG

01/04/2025 → 31/03/2031