Sunil Subedi
Curriculum Vitae

Work Address:	EEID, GRID-C
	Oak Ridge National Laboratory
	1 Bethel Valley Road
	Oak Ridge, TN 37830, USA
Phone:	(605) 690-8826
Email:	sunil.subedi8826@gmail.com
LinkedIn:	https://LinkedIn/sunil
Google Scholar:	http://goo.gl/sunil

Personal Information

Professional Appointments

Aug. 2023 – Present	Postdoctoral Research Associate, Oak Ridge National Laboratory (ORNL), Knoxville, TN, USA
May. 2020 – Aug. 2023	Graduate Research Assistant, Department of Electrical Engineering and Computer Science (EECS), South Dakota State University, Brookings, SD, USA
May 2022 – Dec. 2022	Graduate III Electrical Engineering Research Intern, National Renewable Energy Laboratory (NREL), Golden, CO, USA
Aug. 2019 – May 2020	Graduate Teaching Assistant, Department of Electrical Engineering and Computer Science (EECS), South Dakota State University, Brookings, SD, USA
Oct. 2018 – Apr. 2019	Electrical Engineering Intern, Nepal Electricity Authority (NEA), Chitwan, Nepal

Education

Date	Degree	School
2023	Ph.D. Electrical Engineering GPA: 4.0 (4.0 Scale)	South Dakota State University (SDSU), Brookings, SD, USA
2018	B.E. Electrical Engineering GPA: 3.38 (4.0 Scale)	Tribhuwan University (TU), Kathmandu, Nepal

Doctoral Dissertation:
"Automatic Data-Driven Partitioned Modeling of Power System Dynamics with Smart Power Electronic Inverters"

Doctoral Advisor:
Timothy M. Hansen, SDSU

Awards and Honors

2021   **EPSCoR South Dakota Discovery Center Science Communication Fellow**, Fall 2021.

2017   **"Academic Excellence Award"**, Kathmandu Engineering College, Kathmandu, Nepal. Recognized as one of the top two students out of a cohort of 44 for this award.

2014-2018   **"Scholarship for Semester Excellence"**, Kathmandu Engineering College, Kathmandu, Nepal. Recognized as one of the top two students out of a cohort of 44, with a financial reward of $1000 for achieving the highest rank in each semester. Received this prestigious honor five times out of eight semesters.

Research Activities

Journal Publications

[J7] **Sunil Subedi**, Yonghao Gui, and Yaosuo Xue, "A Review of Machine Learning Applications for Grid-Connected Power Electronic Converters," *IEEE Transactions on Industrial Application*, (In Review).

[J6] Jesus D. Vasquez-Plaza, **Sunil Subedi**, , and Fabio Andrade, "Aggregated Inverter-Based Generator Model Parameterization Via Online Moving Horizon Estimation Using a DER_A Smooth Mathematical Representation," (In Review).

[J5] **Sunil Subedi**, Jesus D. Vasquez-Plaza, Fabio Andrade, Hossein Moradi Rekabdarkolaee, Robert Fourney, Reinaldo Tonkoski, and Timothy M. Hansen, "Aggregated Dynamic Partition Modeling for Active Distribution Network for Stability Studies," *IEEE Systems Journal*, (In Review).

[J4] Bidur Poudel, Nischal Guruwacharya, **Sunil Subedi**, Hossein Moradi Rekabdarkolaee, Reinaldo Tonkoski, and Timothy M. Hansen, "Analysis of Effect of Varying Irradiance in Dynamic Modeling of Photovoltaic Smart Inverter Using Real-Time Digital Simulator," (In Prep).

[J3] **Sunil Subedi**, Bidur Poudel, Pooja Aslami, Robert Fourney, Hossein Moradi Rekabdarkolaee, Reinaldo Tonkoski, and Timothy M Hansen, "Automated data–driven model extraction and validation of inverter dynamics with grid support function," *e-Prime-Advances in Electrical Engineering, Electronics and Energy*, vol. 6, p. 100365, 2023.

[J2] **Sunil Subedi**, Nischal Guruwacharya, Bidur Poudel, Jesus D. Vasquez-Plaza, Fabio Andrade, Robert Fourney, Hossein Moradi Rekabdarkolaee, Timothy M. Hansen, and Reinaldo Tonkoski, "Leveraging data-driven models for accurate analysis of grid-tied smart inverters dynamics," *arXiv*, 2023.

[J1] **Sunil Subedi**, Manisha Rauniyar, Saima Ishaq, Timothy M. Hansen, Reinaldo Tonkoski, Mariko Shirazi, Richard Wies, and Phylicia Cicilio, "Review of Methods to Accelerate Electromagnetic Transient Simulation of Power Systems," *IEEE Access*, vol. 9, pp. 89714–89731, June 2021.

Conference Publications and Presentations

[C7] **Sunil Subedi**, Yonghao Gui, and Yaosuo Xue, "Hybrid Modeling of Three-Phase Grid-Supporting Inverters for Dynamic Studies," in *IEEE Power and Energy Society General Meeting 2024*, (In Review).

[C6] **Sunil Subedi**, Michael Blonsky, Yeongrack Son, and Barry Mather, "Cost-benefit Analysis of Grid-Supportive Loads for Fast Frequency Response," in *2023 IEEE PES Grid Edge Technologies Conference & Exposition (Grid Edge)*, San Diego, CA, USA, 5 pages, April 2023.

[C5] **Sunil Subedi**, Jesus D. Vasquez-Plaza, Robert Fourney, Hossein Moradi Rekabdarkolaee, Fabio Andrade, Reinaldo Tonkoski, and Timothy M. Hansen, "Impact of PLL Design on Data-driven Models for Grid-connected Single-phase Inverters," in *IEEE Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM) 2022*, Sorrento, Italy, 5 pages, June 2022.

[C4] Nischal Guruwacharya, Harish Bhandari, **Sunil Subedi**, Jesus D. Vasquez-Plaza, Matthew Lee Stoel, Ujjwol Tamrakar, Felipe Wilches-Bernal, Fabio Andrade, Timothy M. Hansen, and Reinaldo Tonkoski, "Data-driven Modeling of Commercial Photovoltaic Inverter Dynamics Using Power Hardware-in-the-Loop," in *IEEE Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM) 2022*, Sorrento, Italy, 6 pages, June 2022.

[C3] **Sunil Subedi**, Nischal Guruwacharya, Ujjwol Tamrakar, Phylicia Cicilio, Hossein Moradi Rekabdarkolaee, Robert Fourney, Reinaldo Tonkoski, and Timothy M. Hansen, "Computationally Efficient Partitioned Modeling of Inverter Dynamics with Grid Support Functions," in *47th Annual Conference of the IEEE Industrial Electronics Society (IECON'21)*, special session on Advances in Component and System Modeling and Simulation of Power Systems in Transition to Converter-Dominated Systems, Toronto, Ontario, Canada, Oct. 2021, 6 pages.

[C2] Manisha Rauniyar, Sterling Berg, **Sunil Subedi**, Ujjwol Tamrakar, Timothy M. Hansen, Robert Fourney, and Reinaldo Tonkoski, "Evaluation of Probing Signals for Implementing Moving Horizon Inertia Estimation in Microgrids," in *IEEE North American Power Symposium 2020 (NAPS20)*, Tempe, AZ, 5 pages, Apr. 2021.

[C1] Nischal Guruwacharya, Niranjan Bhujel, Ujjwol Tamrakar, Manisha Rauniyar, **Sunil Subedi**, Sterling E. Berg, Timothy M. Hansen, and Reinaldo Tonkoski, "Data-Driven Power Electronic Converter Modeling for Low Inertia Power System Dynamic Studies," in *IEEE Power and Energy Society General Meeting 2020*, Montreal, Quebec, Canada, 5 pages, Aug. 2020.

Technical Report

[R1] Yeongrack son, **Sunil Subedi**, Michael Blonsky, and Barry Mather, "Hardware implementation and market impacts of grid-supportive functions in end-use loads," Tech. Rep. NREL/TP-5D00-85188, National Renewable Energy Laboratory, Mar. 2023.

Invited Talks

[T3] **Sunil Subedi**, "Automated Data-Driven Partitioned Modeling of Power System Dynamics with Smart Power Electronic Inverters," *Sandia National Laboratories*, invited seminar, Albuquerque, NM, July 2023.

[T2] **Sunil Subedi**, "Dynamic Modeling and Simulation of Converter Dominated Power Systems," *Oak Ridge National Laboratory*, invited seminar, Oak Ridge, TN, March 2023.

[T1] **Sunil Subedi**, "Dynamic Modeling and Simulation of Converter Dominated Power Systems," *National Renewable Energy Laboratory*, invited seminar, Golden, CO, March 2022.

Poster Presentations

[P5] **Sunil Subedi**, Robert Fourney, Hossein Moradi Rekabdarkolaee, Reinaldo Tonkoski, and Timothy M. Hansen, "Automated Data-Driven Model Extraction and Validation of Grid-Tied Single-Phase Inverters Dynamics with Grid Support Function," presented at the *IEEE Power and Energy Society General Meeting Poster Session*, July 2023.

[P4] **Sunil Subedi**, Robert Fourney, Hossein Moradi Rekabdarkolaee, Reinaldo Tonkoski, and Timothy M. Hansen, "Automated Data-Driven Model Extraction and Validation of Grid-Tied Single-Phase Inverters Dynamics with Grid Support Function," presented at the *Graduate Research Scholarship and Creative Activity Day (GRSCAD) Poster Session*, April 2023.

[P3] Michael Blonsky, **Sunil Subedi**, and Barry Mather, "Assessing the Technical Potential of Fast Frequency Response in Grid-Supportive Loads," presented at the *IEEE Power and Energy Society General Meetings Poster Session*, July 2022.

[P2] **Sunil Subedi**, Robert Fourney, Hossein Moradi Rekabdarkolaee, Reinaldo Tonkoski, and Timothy M. Hansen, "Data-driven Model Extraction and Validation of a Grid-tied Single-phase Smart Inverter," presented at the *IEEE Power and Energy Society General Meetings Poster Session*, July 2022.

[P1] **Sunil Subedi**, Phylicia Cicilio, Robert Fourney, Hossein Moradi Rekabdarkolaee, Reinaldo Tonkoski, and Timothy M. Hansen, "Partitioned Dynamic Modeling of Inverter with Grid Support Functions," presented at the *IEEE Power and Energy Society General Meetings Poster Session*, July 2021.

Educational Activities

Teaching Experience

2020 (Spring)	**Instructor:** EE-321/321L Electronics II and Laboratory, SDSU, Brookings, SD, USA
2019 (Fall)	**Instructor:** EE-300/300L Basic Electrical Engineering and Laboratory, SDSU, Brookings, SD, USA

Professional Activities

Professional Society Activities

IEEE
> Grade: Member
> Power and Energy Society (since 2020)

IEEE Power & Energy Society
> Grade: Member
> Power and Energy Society (since 2021)

IEEE Young Professionals
> Grade: Member
> Power and Energy Society (2020-2022)

IEEE Smart Grid Community
> Grade: Member
> Power and Energy Society (since 2020)

Conference Committees and Positions

1. Conference Volunteer Committee, *Grid Forward 2022*, Denver, CO, Oct. 2022.

Activities as a Referee

The specified year indicates the first year of referee activity with the given source.

Journals

2023	IEEE Transactions on Smart Grid
2023	IEEE Transactions on Energy Conversion
2023	Nature Communications
2023	IEEE Power and Energy Technology Systems Journal
2021	IEEE Access
2021	IEEE Systems Journal
2021	IEEE Transactions on Sustainable Energy
2019	Sustainable Computing: Informatics and Systems (SUSCOM)

Conferences and Workshops

2020-2023	IEEE Power & Energy Society General Meeting (PESGM)
2023	IEEE PES Grid Edge Technologies Conference & Exposition (Grid Edge)
2022	IEEE Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM)
2021	IEEE Industrial Electronics Society (IECON)
2020	IEEE North American Power Symposium (NAPS)

Professional Credentials and Certifications

2021	Avera Research Integrity Conference, Responsible Conduct of Research Training Certification
2021	EPRI, GridEd Short Course: Machine Learning and Big Data Analytics in Smart Grid (Distance Learning Certification)
2019	Certified Electrical Engineer by Nepal Engineering Council

Professional Development and Leadership Activities

2020 - 2021	**Executive Committee Member**, SDSU Nepalese Student Association (NeSA), SD, USA
2018	**Event Manager**, Jumla Project, Child Education Nepal (CEN)UK, Nepal
2018	**Organizer**, Tunza Eco-generation E-gen Event, Nepal
2010	**Participants**, 8th National Scout Jamboree, Gazipur, Bangladesh