Sunil Subedi
Curriculum Vitae

Work Address: Electrical Engineering and Computer Science
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Personal Information

Professional Appointments

May. 2020 – Present	Graduate Research Assistant, Department of Electrical Engineering and Computer Science (EECS), South Dakota State University, Brookings, CO
May 2022 – Dec. 2022	Graduate III Eelctrical Engineering Research Intern, Grid Edge Group, National Renewable Energy Laboratory (NREL), Golden, CO
Aug. 2019 – May 2020	Graduate Teaching Assistant, Department of Electrical Engineering and Computer Science (EECS), South Dakota State University, Brookings, CO
Oct. 2018 – Apr. 2019	Electrical Engineering Intern, Nepal Electricity Authority (NEA), Chitwan, Nepal

Education

Date	*Degree*	*School*
2023	Ph.D. Electrical Engineering GPA: 4 (4.0 Scale)	South Dakota State University (SDSU), Brookings, SD
2018	B.E. Electrical Engineering GPA: 3.38 (4.0 Scale)	Tribhuwan University (TU), Kathmandu, Nepal

Doctoral Dissertation:
"Computationally Efficient Dynamic Modeling of Smart Photovoltaic 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

[J5] **Sunil Subedi**, Robert Fourney, Hossein Moradi Rekabdarkolaee, Reinaldo Tonkoski, and Timothy M. Hansen, "Data-Driven Aggregated Dynamic Modeling of Smart PV Inverters in Residential Neighborhoods," (In Prep).

[J4] Nischal Guruwacharya, **Sunil Subedi**, Niranjan Bhujel, Manisha Rauniyar, Jesus D. Vasquez, Bishnu Bhattrai, Sarmad Hanif, Ujjwol Tamrakar, Felipe Wilches-Bernal, Rodrigo D. Trevizan, Shengjie Xu, Timothy M. Hansen, and Reilaldo Tonkoski, "Advanced Grid Support Functions Provided by Smart Inverters on Power System – A Review," (In Prep).

[J3] 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).

[J2] **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 Functions," *ELSEVIER e-Prime- Special Issue*, (In Review).

[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

[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 *47^{th} 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, Ujjwol Tamrakar, Sterling Berg, Sunil Subedi, **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 Reports

[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.

Poster Presentations

[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: Graduate Student Member
Power and Energy Society (since 2019)

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 Nature Communications
2021 IEEE Access
2021 IEEE Systems Journal
2021 IEEE Transactions on Sustainable Energy
2019 Sustainable Computing: Informatics and Systems (SUSCOM)

Conferences and Workshops

2021 IEEE Power and Energy Society

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, Bangaladesh