Aeishwarya Baviskar

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Research Interest

I am interested in optimization and control techniques for integration of renewable energy sources in the grid in co-ordination with flexibility assets such as storage, electric vehicles, etc. I enjoy working on complex modelling, control, and optimization challenges in this area. I am passionate about a sustainable, safe, and equitable future for everyone.

Education

Technical University of Denmark (DTU) — *Denmark*
Ph.D. ; Department of Wind and Energy Systems — May. 2020 - May. 2023
- Thesis Topic: Wind Power Plant Support in Weather-Dependent Active Distribution Networks
- Supervisors: Dr. Anca D. Hansen, Dr. Kaushik Das, Dr. Matti Koivisto

Technical University of Munich (TUM) — *Germany*
M.Sc. in Power Engineering | German Grade: 1.5 [Equivalent: 9/10] — Oct. 2017 - Nov. 2019
- Thesis Topic: Parameter Estimation in Li-ion Batteries in the context of Hybrid Power Plants
- Supervisors: Dr. Andrei Szabo (Siemens AG), Prof. Andreas Jossen (TUM)

Visvesvaraya National Institute of Technology (VNIT) — *India*
B.Tech. in Electrical and Electronics Engineering | Grade: 8.13/10 — June. 2012 - May. 2016

Experience

Research and Academic Experience

Imperial College of London — *London, United Kingdom*
Visiting Researcher, Control and Power Group, Department of Electrical Engineering — May 2022 - July 2022
- Supervisor and primary contact: Prof. Bikash Pal, Dr. Firdous Ul Nazir
- Collaborated with research group from Imperial on developing novel optimization framework for large multi-voltage networks

Green Power Denmark [Former: Dansk Energi] — *Copenhagen, Denmark*
Visiting Researcher — May 2021 - Sept 2021
- Supervisor and primary contact: Dr. Kenneth Rosenørn, Dr. Philip Douglass
- Validated open-source multi-voltage level distribution grid model using real-time data in collaboration with researchers at Dansk Energi
- Mapped synergies between Danish distribution system operator challenges and objectives of the PhD research

Technical University of Denmark — *Roskilde, Denmark*
Early Stage Researcher, Department of Wind and Energy Systems — May 2020 - May 2023
- Thesis Topic: **Wind Power Plant Support for Weather-dependent Active Distribution Networks**
- Funding: Marie Sklodowska Curie Felloship

Siemens AG — *Munich, Germany*
Master's Thesis Student — April. 2019 - Nov. 2019
- Thesis Topic: **Parameter Estimation in Li-ion Batteries in context of Hybrid power plants**
- Developed an optimization algorithm to estimate the parameters including the OCV Vs. SOC curve for Li-ion batteries based on time-series data from a Hybrid Power Plant
- Implemented a capacity estimation algorithm to get a capacity estimate within 2% error from the reference value

Fraunhofer Institute of Solar Energy Research (ISE) — *Freiburg, Germany*
Summer Research Intern — Aug. 2018 - Oct. 2018
- Conducted a thorough literature review on the adaptive control methods for power electronic converters
- Recommended effective and scenario based adaptive control methods for various applications

Indian Institute of Science (IISc) — *Bangalore, India*
Research Assistant — Aug. 2016 - June. 2017
- Developed frequency dependent transmission line model for Real time simulator. Languages used: MATLAB & C
- Designed a lab prototype model of frequency dependent transmission line and validated against simulation results
- Implemented an optimization algorithm to get line parameters through its frequency response

Industrial Experience

Siemens AG *Munich, Germany*

Part-time Working Student Nov. 2019 - Feb. 2020

- Implemented machine learning methods for parameter estimation for Li-ion batteries

Infineon AG *Munich, Germany*

Part Time Working Student Jan. 2018 - June 2018

- Development, debugging and execution of system tests for application oriented verification of semiconductor device functionality under different operating conditions such as voltage temperature, and load profile transients
- Programming of test host, evaluation bopards and embedded power devices for simulation, control and detection of ICs such as CAN-Bus and SPI

Western Regional Load Dispatch Center (GRID-India) *Mumbai, India*

Summer Internship June 2015 - Aug. 2015

- Gained key insights into understanding the electricity, regulation, and balancing markets in India
- Learned about roles of various regulating bodies such as the western regional load dispatch center in maintenance of the Indian power grid

Awards & Honors

- Received Otto Mønsted Funding worth 15,000 DKK for external research stay at Imperial College of London
- Received Marie Curie Sklodowska Fellowship for pursuing doctoral research at Technical University of Denmark
- Invited for a panel discussion on 'Supporting Grid Operations Through Large Wind Farms' at the IEEE Innovative Smart Grid Technologies-Middle East Conference (March 2023)
- Secured 99.13 percentile and All India Rank of 1031 amongst 125k candidates in the Graduate Aptitude Test in Engineering 2016 conducted by Indian Institute of Science, Bangalore

Synergistic Activities

- Actively Contributing to IEA Task 41 on Distributed Wind in Future Energy Systems
- Part of the CIGRE Workgroup C6.44 Nodal Value of Distributed Renewable Energy Generation
- Reviewer of IET Generation, Transmission and Distribution since 2021
- Student Representative in the Work Environment Group at the Department of Wind and Energy Systems, DTU
- Active collaboration with Technical University of Munich (TUM) on value of co-located and stand-alone battery systems in distribution grid
- Responsible for conducting bi-weekly 'Coffee and Research' meeting within the section Renewable Plant and Energy Systems at Department of Wind and Energy Systems, DTU
- Co-hosted a mini-symposium on Co-ordinated Control of Wind Power in Power Systems with Large Share of Renewables in the Wind Energy Science Conference 2021 (Virtual Event)

Teaching

- Teaching Assistant for the Master's Course on Power Systems Balancing in the year 2021 and 2022 at DTU (Denmark)
- Worked as a private tutor for high-school mathematics 2019-2020 (Germany)
- Worked as a private tutor for MATLAB for bachelor's student 2019-2020 (Germany)
- Taught a course on Power Systems Basics to fellow batch mates from Mechanical Engineering during Master's Course at TUM in an initiative to bridge knowledge gap in the interdisciplinary Master's courses (Germany)
- Conducted classes on Electrical Machines for junior batch mates in an initiative to help weaker students during bachelor's studies at VNIT (India)

Skills

Technical Skills

Programming	Python, MATLAB, C, C++, GAMS, Julia, VHDL, Verilog, R
Simulation Softwares	MATLAB-Simulink, PSIM, Labview, EMTP-RV, PSS-SINCAL
Operating Systems	Windows, Linux
Optimization Tools	MATLAB (optimization toolbox: CPLEX, MOSEK, CVX), Python (CVXPY, Scipy), GAMS

Research Skills

Ability to peruse and interpret relevant literature from academia and industry

Excellent writing, oral, and presentation skills developed through writing scientific papers and technical reports

Personal

Nationality	Indian
Languages	English, Marathi, Hindi, German
Date of Birth	25th Sept. 1994

Publications

Journal

[J1] **A. Baviskar**, K. Das, M. J. Koivisto and A. D. Hansen, "Multi-Voltage Level Active Distribution Network with Large Share of Weather-Dependent Generation," in IEEE Transactions on Power Systems, doi: 10.1109/TPWRS.2022.3154613

[J2] **Baviskar, A.** and Hansen, A. D. and Das, K and Nazir, F. U., Reactive Power Potential of Converter-Connected Renewables Using Convex Power Flow Optimization under review in International Journal of Electrical Power and Energy Systems (IJEPES). Available at SSRN: 10.2139/ssrn.4239650

[J3] **Baviskar A.**, Nazir F., Das K., Hansen A.D., Strategic Optimization Framework for Multi-Voltage Active Distribution Networks, under review in IEEE Transactions in Sustainable Energy.

Conference

[C1] **Baviskar, A** & Hansen, A. D. & Das, K. (2022). Reactive Power Support from Converter Connected Renewables in Active Distribution Network.

[C2] **A. Baviskar**, A. D. Hansen, K. Das and P. J. Douglass, "Open-Source Active Distribution Grid Model with a large share of RES- features, and studies," 2021 9th IEEE International Conference on Power Systems (ICPS), 2021, pp. 1-6, doi: 10.1109/ICPS52420.2021.9670223.

[C3] **Baviskar, A.**; Das, K.; Hansen, A. D.: 'MINIMIZE DISTRIBUTION NETWORK LOSSES USING WIND POWER', IET Conference Proceedings, , p. 1954-1958, IET Digital Library, doi:10.1049/icp.2021.2143

[C4] **Baviskar A**, Hansen AD, Das K, Koivisto M. Challenges of Future Distribution Systems with a Large Share of Variable Renewable Energy Sources–Review. In 19th Wind Integration Workshop 2020 Available

[C5] G. Gurrala, **A. Baviskar** and K. K. Challa, "An Intuitive Approach to Fit A frequency Dependent Equivalent Circuit for Transmission Line Models," 2018 20th National Power Systems Conference (NPSC), 2018, pp. 1-6, doi:10.1109/NPSC.2018.8771794.

Dataset

[D1] **Baviskar A**; Hansen AD,; Das K, Koivisto M, (2021): DTU 7k-Bus Active Distribution Network. Technical University of Denmark. Collection. 10.11583/DTU.c.5389910.v1

References available on request.

Aeishwarya Baviskar,
November 28, 2022