Subir Majumder April 7, 1991

✉ subir.majumder@mail.wvu.edu   ✉ sm508@uowmail.edu.au   ☎ +1 509-595-9376   Ⓢ subir.12
616 8th Street Apt. 2, Morgantown 26505, WV, USA

Research Interests	• Power System Resiliency. • Applied Power System Optimization. • Applied Power System Economics & Game Theory. • Power System Operations & Planning. • Modeling of Cyber-Power System.
Research Experience	**September, 2021 - Present, Engineering Scientist, West Virginia University, WV, USA.** Contributed to two projects: US DOE UI-ASSIST and NSF CPS aDoption. Research in distributed optimization, resilient operation of the power distribution system, and development of retail electricity markets with DERs. Mentoring PhD students for distributed algorithm development with discrete variables and test-bed development for distributed applications. Collaborated for machine learning-based power system operational control algorithm development. Contributed to writing proposals for external funding. **January, 2020 - August, 2021, Post-Doctoral Research Associate, Washington State University, WA, USA.** Research in distributed optimization and resilient operation of the power distribution system with DERs. Mentoring undergraduate students for test-bed development. Collaborated for machine learning-based power system operational control algorithm development. Contributed to writing proposals for external funding. **July, 2019 - December, 2019, Research Associate, Indian Institute of Technology Bombay, Mumbai, India.** Research in power quality economics.
Education	**2020, Ph.D., Indian Institute of Technology Bombay (IITB), India and University of Wollongong (UOW), Australia (under a Cotutelle/Joint Agreement).** **Dissertation:** *Techno-economic analysis of electricity networks with renewable energy sources and storage devices.* Principal Advisors: Dr. S. A. Khaparde, and Dr. A. P. Agalgaonkar • *The dissertation has been presented in a panel session at IEEE Power and Energy Society General Meeting, 2019.* **2020, M.Tech. in Energy Systems Engineering (under the M.Tech. + Ph.D. Dual Degree programme), Indian Institute of Technology Bombay, India.** **2012, B.Tech. in Electrical Engineering, Kalyani Govt. Engineering College, West Bengal University of Technology, India.**
Journals	[J1] **S. Majumder**, S. A. Khaparde, A. P. Agalgaonkar, S. V. Kulkarni, and S. Perera, "Voltage Sag Mitigation Cluster Formation employing Graph-Partitioning Theory utilizing Dynamic Voltage Restorers in Radial Distribution Networks," *IEEE Trans. Power Del.*, vol. 37, no. 1, pp. 18-28, Dec. 2020. [J2] **S. Majumder**, A. P. Agalgaonkar, S. A. Khaparde, S. Perera, S. V. Kulkarni, and P. P. Ciufo, "Allowable Delay Heuristic in Provision of Primary Frequency Reserve in the Future Power System," *IEEE Trans. Power Syst.*, vol. 35, no. 2, pp. 1231-1241, Aug. 2019. [J3] **S. Majumder**, A. P. Agalgaonkar, S. A. Khaparde, P. P. Ciufo, S. Perera, and S. V. Kulkarni, "Allocation of Common-Pool Resources in an Unmonitored Open

System," *IEEE Trans. Power Syst.*, vol. 34, no. 5, pp. 3912-3920, Sept. 2019.

[J4] **S. Majumder**, S. A. Khaparde, A. P. Agalgaonkar, P. P. Ciufo, S. Perera, and S. V. Kulkarni, "DFT-Based Sizing of Battery Storage Devices to Determine Day-Ahead Minimum Variability Injection Dispatch with Renewable Energy Resources," *IEEE Trans. Smart Grid*, vol. 10, no. 1, pp. 626-638, Jan. 2019.

[J5] **S. Majumder**, R. M. Shereef, and S. A. Khaparde, "Two-Stage Algorithm for Efficient Transmission Expansion Planning with Renewable Energy Resources," *IET Renew. Energy,* vol. 11, no. 3, pp. 320-329, Feb. 2017.

[J6] **S. Majumder** and S. A. Khaparde, "Revenue and Ancillary Benefit Maximisation of Multiple Non-collocated Wind Power Producers Considering Uncertainties," *IET Gen. Transm. Distrib.,* vol. 10, no. 3, pp. 789-797, Jul. 2016.

[J7] **S. Majumder**, G. Kandaperumal, S. Pandey, A. K. Srivastava, and C. Koplin, "Pre-Event Two-Stage Proactive Control for Enhanced Resiliency," *IEEE Access,* vol. 10, pp. 83281-83296, 2022.

[J8] **S. Majumder**, "Premium Power Investment Strategy utilizing the Economy of Scale of Custom Power Devices," *Elec. Pow. Syst. Res.,* vol. 214 Art. No. 108743, Jan. 2023.

[J9] A. Vosughi, A. Tamimi, A. B. King, **S. Majumder**, and A. K. Srivastava, "Cyber-physical Vulnerability and Resiliency Analysis for DER Integration: A Review, Challenges and Research Needs," *Renew. Sust. Energ. Rev.,* vol. 168, Art. no. 112794, 2022.

[J10] **S. Majumder**, N. Patari, A. K. Srivastava, P. Srivastava, and A. M. Annaswamy, "Epistemology of Voltage Control in DER-Rich Power System," *Elec. Pow. Syst. Res.,* (Accepted for publication).

[J11] S. U. Kadir, **S. Majumder**, A. Chhokra, A. Dubey, H. Neema, A. Laszka, and A. K. Srivastava, "Reinforcement Learning based Proactive Control for Transmission Grid Resilience to Wildfire," available: arXiv:2107.05756

Newsletter & Book Chapter	[N1] **S. Majumder**, and A. K. Srivastava, "Resilience-driven Integration of Distributed Energy Resource (DER): Holistic Value Analysis," in *IEEE Smart Grid Newsletters*, Sept. 2022. [B1] G. Kandaperumal, **S. Majumder**, and A. K. Srivastava, "Microgrids as a Resilience Resource in the Electric Distribution System," *book chapter* in *Elsevier- Electric Power Systems Resiliency – Modelling, Opportunity and Challenges*, Paperback ISBN: 9780323855365, 1st Ed., July 1, 2022.
Conference Publications	[C1] **S. Majumder**, S. A. Khaparde, V. Pradhan, A. P. Agalgaonkar, and S. Perera, "Optimal Voltage Sag Mitigation Solution Provision using Customers Approximate Marginal Willingness-to-Pay Function," in IEEE PowerTech, Jun. 2021. [C2] **S. Majumder**, S. A. Khaparde, A. P. Agalgaonkar, S. V. Kulkarni, S. Perera, and P. P. Ciufo, "Hybrid Storage System Sizing for Minimum Daily Variability Injection," in TENSYMP, Jun. 2019. [C3] **S. Majumder**, S. A. Khaparde, V. Pradhan, S. V. Kulkarni, A. P. Agalgaonkar, S. Perera, and P. P. Ciufo, "A Critical Review on the Methods for Calculating the Risk of Process Failure because of Voltage Sags," in POWERCON, Oct. 2016. [C4] N. V. Vigil, **S. Majumder**, V. Pradhan, Padmini V., and S. A. Khaparde, "Transmission Expansion Planning with Variable Wind Source," in NPSC, Dec. 2014. [C5] S. Knudsen, **S. Majumder**, and A. K. Srivastava, "Securely implementing and managing neighborhood solar with storage and peer to peer transactive energy," in *Cigre Annual Meeting.*, Aug. 2022. [C6] J. Adan, **S. Majumder**, and A. K. Srivastava, "Distributed Optimization Ap-

proaches with Discrete Variables in the Power Distribution Systems," accepted for publication in NAPS, 2022.

[C7] P. S. Sarker, N. Patari, B. Ha, **S. Majumder**, and A. K. Srivastava, "Quasi-Static Cyber-Power Co-Simulation Platform for Performance Analysis of Distributed VAR Control during Cyber-Attacks," in MSCPES, May 2022.

Manuscripts Under Review	[R1] **S. Majumder**, S. A. Khaparde, A. P. Agalgaonkar, S. V. Kulkarni, A. K. Srivastava, and S. Perera, "Chance-Constrained Pre-Contingency Joint Self-Scheduling of Energy and Reserve in a VPP," under first revision in *IEEE Trans. Power Syst.*
	[R2] **S. Majumder**, A. Vosughi, T. E. Warner, and A. K. Srivasava, "On the Cyber-Physical Needs of DER-based Voltage Control Algorithms," under review in *IEEE Access*.
	[R3] **S. Majumder**, F. A. Martina, S. Pannala, and A. K. Srivastava, "Real-Time Resiliency Monitoring and Decision Support: A Use Case for Reconfiguration of Networked μ-grids," under review in *MDPI Energies* (Invited Paper).
	[R4] P. S. Sarker, **S. Majumder**, M. F. Rafy, and A. K. Srivastava, "Impact Analysis of Cyber-Events on Distributed Voltage Control with Active Power Curtailment," Digest accepted in PEDES, 2022, invited for full paper.
Reports	[S1] State level smart grids road-map for Maharashtra, India, *Technical Report*.
Doctoral Research	• Sizing and operation of storage devices to mitigate renewable energy variability.
	• Determining reserve requirement and the allowable delay in a low-inertia system to contain frequency excursions.
	• Establishment of efficient policies of procuring and sharing the cost of a voltage sag mitigation device.
Fellowships and Awards	• Conferred POSOCO Power System Awards (PPSA) under Doctoral category, 2020.
	• Recommended for the Best Ph.D. Thesis award, IITB, 2020. *One of the selected external examiners stated: "the thesis presents the research carried out by the student in an innovative (way of thinking) manner addressing the problem of low inertia due to renewable energy integration."*
	• Recommended for special commendation for an Outstanding Ph.D. Thesis, UOW, 2020. *One of the selected external examiners noted: "Recommends no revision, and special commendation. He/she notes that the thesis is a solid and addresses a number of topics that have resulted in high quality publications. In addition, he/she highlights the fact the student is able to identify research problems and develop innovative solutions."*
	• Granted University Postgraduate Award (UPA) and Institute Postgraduate Tuition Award (IPTA) from the University of Wollongong, Australia, 2016-2017.
	• Granted TA-ship for M.Tech.+Ph.D. program, Govt. of India, 2012-2018.
	• Awarded full free scholarship from Kalyani Govt. Engineering College, Govt. of West Bengal, India (2008-2012).
Teaching Experience	• Delivered a few lectures in *Smart Grids* course at IITB, Autumn, 2018.
	• Teaching Assistant, *Energy Management*, IITB, Spring, 2016.
	• Assisted in conducting the CEP course on *Energy Management* at IITB, 2015.
	• Head Teaching Assistant, *Introduction to Electrical Systems*, IITB, Autumn, 2014 and 2015.
	• Teaching Assistant, *Power Systems*, IITB, Spring, 2014 and 2015.
	• Teaching Assistant, *Fundamentals of Energy Engineering,* IITB, Spring, 2013.
	• Teaching Lab demonstrator, *Power Electronics and Drives,* UOW, Spring, 2017.
	• Teaching Lab demonstrator, *Power Engineering 1,* UOW, Autumn, 2017.

Mentoring Experience	• Mentoring one undergraduate student, Feb. 2017-Jun. 2017. • Supported in mentoring two undergraduate summer students, May 2020-Aug. 2020. • Supported in mentoring one undergraduate and one postgraduate student, Jan. 2021-Dec. 2021. • Mentoring two PhD students, Jan. 2022 - Present.
Technical Skills	• Proficient in *GAMS* as a mathematical modeling and optimization tool. • Proficient in *Matlab*, with *Simulink* and *MatPower*, and OpenDSS. • Basic use of *PSS/E*, PSCAD, RSCAD and *Python*. • Attended DWIH (Geschäftsstelle Deutsche Wissenschafts- und Innovationshäuser) Workshop on "Grant Writing & Management", Nov. 2019, and various other proposal writing. • Languages: Bengali (proficient), English (proficient), German (basic, received training from DAAD) and Hindi (basic).
Courses or Tutorials Attended	Applied Linear Algebra, Applied Multivariate Statistics in Chemical Engg., Computer-Aided Power System Analysis, Distributed Generation and Microgrids, Energy Systems Modeling and Analysis, Game Theory: I, Games and Information, Microeconomics: When Markets Fail, Numerical Methods and Programming, Optimization and Game Theory: From Basics to the Latest Trends, Restructured Power Systems.
Services and Associations	• Member, *IEEE, IEEE Power and Energy Society, IEEE Control Systems Society.* • Member, IEEE WG on Modern & Future Distribution System Planning, IEEE CAMS WG on Computational Challenges & Solutions for Implementing Distributed Optimization, IEEE TF on Operational Tools for Enabling Resiliency, BPSO Subcommittee, PSOPE Committee. • Reviewer, *IEEE Trans. Power Del., IEEE Access, IEEE Trans. Sust. Energy, IEEE Trans. Power Syst., Energies, PESGM 2018.* • Proctor, *IEEE xTreme 2017*, Judge, *14th Annual Summer Undergraduate Research Symposium, WVU, 2022 Spring Undergraduate Research Symposium, WVU, 2022 IEEE PES GM Student Poster Competition.* • Assisted in conducting (also attended) *Master of Electrical Power Engineering* program at UOW, Apr. 2017. • Web Administrator at *IEEE UOW student branch*, 2016-2017. • Co-lead technical sessions group in National Power Electronics Conference (NPEC) held at IIT Bombay, Dec. 2015.
Career Objectives	I am an adaptive, enthusiastic, fast-learning, focused, and ambitious researcher, possessing strong analytical and problem-solving skills, looking to significantly contribute to future power grid operations. I am highly passionate about power systems optimization and seeking every opportunity to improve my skillsets so that I am able to contribute to original and novel algorithm development. I can work individually or as a part of a multi-disciplinary team. I have already collaborated with others in developing test-beds for analyzing distributed algorithm performance (with students at WVU) and developing machine learning approaches for power systems operation (with researchers from the University of Houston and Vanderbilt University). I am also working with Massachusetts Institute of Technology researchers to develop alternative retail electricity markets using various centralized and distributed architectures. I have limited teaching and mentoring experience, and my mentees appreciated my contribution to their research. All these qualities make me believe I can take the next set of challenges for power systems operations while being an all-around academician.