Parikshit Pareek, Ph.D.

Power System Optimizer

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EDUCATION

Ph.D.	Electrical Engineering	Nanyang Technological University, Singapore	4.75/5.0	2023
M.Tech.	Energy Studies	Indian Institute of Technology Delhi, India	9.389/10.0	2018
B.Tech.	Electrical Engineering	University College of Engineering, Kota, India	78.56/100.0	2015

PROFESSIONAL EXPERIENCE

Post Doctoral Research Associate, Los Alamos National Laboratory Since Mar. 2023

- Developing learning-embedded methods for power system's operation under uncertainty
- Assessing quantum computing potential for power system analysis and optimization
- Designing physics-inspired Bayesian learning toolbox for risk-aware market clearing

Research Assistant, EEE, NTU Singapore Aug. 2022 - Feb. 2023

- Developed a Bayesian learning-based P2P market convergence prediction model to detect cyber-attacks
- Designed a risk-ranking method for node voltages using closed-form state sensitivity functions

Graduate Researcher, Clean Energy Research Laboratory, EEE, NTU Singapore Jul. 2018 - Jul. 2022

- Developed a general analytical approximations framework power flow under injection uncertainties
- Proposed methods for non-parametric, interpretable OPF proxy development & Joint CC-OPF solution
- Formulated and solved first-of-its kind convexified small-signal stability constrained optimal power flow

SELECTED HONORS AND AWARDS

Selected for participation in Global Young Scientist Summit (GYSS) Organized by NRF, Singapore	2023
Nanyang Technological University Research Scholarship, NTU Singapore	2018-2022
POSOCO Power System Award (One of the Ten Best Master's Thesis in India), Grid India	2019
Dr. Shankar Dayal Sharma (Former President of India) Gold Medal, IIT Delhi	2018
Shrimati Jawala Devi - Sita Ram Kaushik Award, IIT Delhi	2018
Bhagirathi - Bashisht Tiwari Award, IIT Delhi	2018
Prof. O.P Gupta Medal, IIT Delhi	2018

PUBLICATIONS

268 Citations

Peer-Reviewed Journal Papers

[J14] A. Singh, **P. Pareek**, L.P.M.I. Sampath, L. Goel, H. B. Gooi, and H. D. Nguyen (2024), "A Stress-Cognizant Optimal Battery Dispatch Framework for Multi-Market Participation" *IEEE Transactions on Industrial Informatics*, Early Access. (IF: 12.3)

[J13] **P. Pareek**, L.P.M.I. Sampath, H. D. Nguyen and Y.S. E. Foo (2023), "Locating Critical Prosumers in P2P Dominant Grid using State Sensitivity Function" *IEEE Transactions on Smart Grid*, 14(5), pp. 4145-48. (IF: 9.6)

[J12] S. Mittal, **P. Pareek**, and A. Verma (2023) "Distribution Line Parameters Estimation Framework with Correlated Injections using Smart Meter Measurements", *Electric Power Systems Research*,Accepted. (IF: 3.9)

[J11] **P. Pareek**, and H. D. Nguyen (2022), "A framework for analytical power flow solution using Gaussian process learning," *IEEE Transactions on Sustainable Energy*, 13(1), pp. 452-463. (IF: 8.8)

[J10] **P. Pareek**, and H. D. Nguyen (2022), "A Convexification Approach for Small-Signal Stability Constrained Optimal Power Flow," *IEEE Transactions on Control of Network Systems*, 8(4), pp. 1930-1941. (IF: 4.2)

[J9] B. Kandpal, **P. Pareek**, and A. Verma (2022), "A robust day-ahead scheduling strategy for EV charging stations in unbalanced distribution grid," *Energy*, 249, 123737 pp. 1-9. (IF: 9.0)

[J8] S. Ly, **P. Pareek**, and H. D. Nguyen (2022), "Scalable Probabilistic Optimal Power Flow for High Renewables Using Lite Polynomial Chaos Expansion," *IEEE Systems Journal*, Early Access. (IF:4.4)

[J7] **P. Pareek**, and H. D. Nguyen (2022), "Non-parametric Joint Chance-Constrained OPF via Maximum Mean Discrepancy Penalization," *Electric Power Systems Research* (special issue for XXII *Power Systems Computation Conference*), 212, 108482, pp. 1-9. (IF: 3.9)

[J6] **P. Pareek***, W. Yu*, and H. D. Nguyen (2021), "Optimal Steady-State Voltage Control Using Gaussian Process Learning," *IEEE Transactions on Industrial Informatics*, 17(10) pp. 7017 - 7027. (IF: 12.3)
*Equal Contribution

[J5] **P. Pareek**, and H. D. Nguyen (2021), "Gaussian process learning-based probabilistic optimal power flow," *IEEE Transactions on Power Systems*, 36(1) pp. 541 - 544. (IF: 6.6)

[J4] **P. Pareek**, and H. D. Nguyen (2021), "State-Aware Stochastic Optimal Power Flow," *Sustainability*, 13(14), pp. 7577. (IF:3.9)

[J3] **P. Pareek**, C. Wang, and H. D. Nguyen (2021), "Non-parametric probabilistic load flow using Gaussian process learning," *Physica D: Nonlinear Phenomena*, 424, 132941 pp. 1-9. (IF: 4.0)

[J2] **P. Pareek**, and H. D. Nguyen (2020), "Probabilistic robust small-signal stability framework using gaussian process learning," *Electric Power Systems Research* (special issue for XXI *Power Systems Computation Conference*), 189, 106545, pp. 1-9. (IF: 3.9)

[J1] **P. Pareek**, and A. Verma (2018), "Piecewise Linearization of Quadratic Branch Flow Limits by Irregular Polygon," *IEEE Transactions on Power System*, 33(6), pp. 7301–7304. (IF: 6.6)

Work-In-Progress Journal Papers

[W4] **P. Pareek**, D. Deka, and S. Misra, "Graph-Structured Kernel Design for Power Flow Learning using Gaussian Processes". Pre-Print

[W3] **P. Pareek**, A. Jayakumar, C. Coffrin and S. Misra, "Demystifying Quantum Power Flow: Unveiling the Limits of Practical Quantum Advantage". Pre-Print

[W2] **P. Pareek**, D. Deka, and S. Misra, "Data-Efficient Strategies for Probabilistic Voltage Envelopes under Network Contingencies" Pre-Print

[W1] **P. Pareek***, L. P. M. I. Sampath*, A. Singh, L. Goel, H. B. Gooi and H. D. Nguyen, "Degradation-Infused Energy Portfolio Allocation Framework: Risk-Averse Fair Storage Participation", (* Equal Contribution).

Peer-Reviewed Conference Proceedings

[C8] **P. Pareek**, L.P.M.I. Sampath, H. D. Nguyen and Y.S. E. Foo (2023), "A Convergence Predictor Model for Consensus-based Decentralised Energy Markets" *15th ACM International Conference on Future & Sustainable Energy Systems*, Singapore, 2024

[C7] S. Mittal, **P. Pareek**, and A. Verma (2022), "Assessment of Flexibility Region at TSO-DSO Interface with Dispatchable Resources," *22nd National Power Systems Conference (NPSC)*, New Delhi, India.

[C6] **P. Pareek**, A. Singh, L. P. M. I. Sampath, H. B. Gooi, and H. D. Nguyen (2022), "Privacy-Preserving Feasibility Assessment for P2P Energy Trading and Storage Integration," *IEEE Power & Energy Society General Meeting (PESGM)*, Denver, CO, USA.

[C5] L. Kumar, **P. Pareek**, S. Nadarajan, S. Dasgupta, A. Gupta, and H. D. Nguyen (2021), "Health-Focused Optimal Power Flow," *IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT)*, Washington, DC, USA.

[C4] **P. Pareek**, J. Xie, W. Yu , A. Singh, and H. D. Nguyen (2021), "Probabilistic-based Optimal Storage Placement and Sizing Enabling Networked Microgrid Community," *International Conference on Smart Energy Systems and Technologies (SEST)*, Vaasa, Finland.

[C3] **P. Pareek**, S. Sharma, and A. Verma (2020), "Price-Based Demand Response with Linear OPF," *IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES)*, Jaipur, India.

[C2] **P. Pareek**, K. Turitsyn, K. Dvijotham and H. D. Nguyen (2019), "A sufficient condition for small-signal stability and construction of robust stability region," *IEEE Power & Energy Society General Meeting (PESGM)*, Atlanta, GA, USA.

[C1] **P. Pareek**, and A. Verma (2018), "Linear OPF with linearization of quadratic branch flow limits," *IEEMA Engineer Infinite Conference (eTechNxT)*, New Delhi, India.

Theses

- Ph.D.: "Analytical Approximations and Decision-Making Techniques for Power Systems under Uncertainty," *Nanyang Technological University*, 2022.
- M.Tech.: "Linear Optimal Power Flow Analysis and Applications," *Indian Institute of Technology Delhi*, 2018.

Technology Premiers

- "Green Data Center," *College of Engineering*, *Nanyang Technological University*, 2021.

TEACHING & MENTORING

Teaching Experience

- Teaching Assistant, School of Electrical and Electronic Engineering, NTU Singapore 2018-2022
  - Teaching assistant for the undergraduate-level "EE4504-Design of Clean Energy Systems" course (≈ 50 students).
  - Teaching assistant for the undergraduate-level "EE2073-Intro to EEE Design & Project" course (≈ 50 students).
- Completed "University Teaching for Teaching Assistants" (HWG702) course at NTU Singapore 2019
- Teaching Assistant, Department of Energy Science and Engineering (CES), IIT Delhi 2017-2018
  - Teaching assistant in Master's level course ESL 796 - Operation and Control of Electrical Energy Systems (≈ 15 students) (Course Coordinator: Prof. Ashu Verma)
  - Assisted course instructor in organizing undergraduate lab ESP 260 - Electrical Energy Laboratory

Student Mentorship

- Sonam Mittal, "Data driven techniques for distribution system analysis and optimization," Ph.D. Candidate, *Indian Institute of Technology Delhi*, (Advisor: Prof. Ashu Verma IITD). 2022-Ongoing
- Mentored Four Final Year Projects at EEE, NTU– Resulting in Successful Graduation 2019-2022

EDITORIAL SERVICE

- Invited Peer-Reviewer for the following journals and conferences:
  - *IEEE Transactions on Power System*
  - *IEEE Power Engineering Letters*
  - *Electrical Power System Research*
  - *IET Smart Grid*
  - *Power System Computation Conference*
  - *IEEE Transactions on Smart Grid*
  - *IET Generation, Transmission & Distribution*
  - *Journal of Modern Power Systems and Clean Energy*
  - *Applied Energy*
  - *IEEE PES General Meeting*

PROFESSIONAL MEMBERSHIPS

- Member, IEEE Since 2023
- Member, Power & Energy Society (PES), IEEE Since 2023
- Graduate Student Member, IEEE 2019-2022
- Graduate Student Member, Power & Energy Society (PES), IEEE 2019-2022

TECHNICAL SKILLS

- Julia
- MATLAB
- Python
- Optimization
- Mathematica
- CVX
- CUDA
- GPML
- YALMIP
- LaTeX

PRESENTATIONS & TALKS

- Closed-form Power Flow: Putting Intuition into Gaussian Process, AI4OPT, Georgia Tech, Atlanta Nov. 2023
- Graph-Structured Kernel Design for Power Flow, NREL AES Workshop, Denver, USA Sept. 2023
- Privacy-Preserving Feasibility Assessment, IEEE PES General Meeting, Denver, USA Jul. 2022

- Joint CC-OPF via MMD Penalization, Power System Computation Conference, Porto, Portugal Jun. 2022
- Probabilistic Robust Small-signal Stability Framework, Power System Computation Conference Jun. 2020
- A Sufficient Robust Small-signal Stability Condition, IEEE PES General Meeting, Atlanta, USA Aug. 2019