# Parikshit Pareek, Ph.D.

**Power System Optimizer**

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## EDUCATION

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|---|---|---|---|
| Ph.D. | Electrical Engineering | Nanyang Technological University, Singapore | 2023 |
| M.Tech. | Energy Studies | Indian Institute of Technology Delhi, India | 2018 |
| B.Tech. | Electrical Engineering | University College of Engineering, Kota, India | 2015 |

## PROFESSIONAL EXPERIENCE

**Assistant Professor, Department of Electrical Engineering, IIT Roorkee, India** Since Oct. 2024
**Affiliate Guest Researcher, Theoretical Division, Los Alamos National Laboratory** Since Oct. 2024
**Post Doctoral Research Associate, Theoretical Division, Los Alamos National Laboratory** Mar. 2023 - Oct. 2024
**Research Assistant, EEE, NTU Singapore** Aug. 2022 - Feb. 2023

## 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

## FUNDING HISTORY

[G2] **Principle Investigator** – "Secure EV-Rich Distribution Grid Operations via Prior-data Fitted Networks" Prime Minister Early Career Research Grant (PMECRG) Scheme , Anusandhan National Research Foundation (ANRF), India. Total Amount: ₹71.2 Lakh. Personal Share: ₹71.2 Lakh (₹7.12 Million). **2025**

[G1] **Principle Investigator** – "Scalable Power System Operations under Uncertainty via GPU- Accelerated Gaussian Processes" *Faculty Initiation Grant*, Indian Institute of Technology Roorkee, India. Total Amount: ₹20 Lakh. Personal Share: ₹20 Lakh. (₹2 Million) **2025**

## PUBLICATIONS

**396 Citations**

### Peer-Reviewed Journal and A* Conference Papers

[J18] **P. Pareek**, A. Jayakumar, K. Sundar, D. Deka, S. Misra (2025) "Optimization Proxies using Limited Labeled Data and Training Time–A Semi-Supervised Bayesian Neural Network Approach", *ICML 2025- Forty-Second International Conference on Machine Learning*, Canada. Accepted.

[J17] **P. Pareek**, D. Deka, S. Misra (2025) "Data-Efficient Strategies for Probabilistic Voltage Envelopes under Network Contingencies", *Sustainable Energy, Grids and Networks (IREP 2025 Italy)*. Accepted.

[J16] **P. Pareek**★, L.P.M.I. Sampath★, A. Singh★, L. Goel, H. B. Gooi, and H. D. Nguyen (2024), "Degradation-infused energy portfolio allocation framework: Risk-averse fair storage participation" *Energy* , 313, 133688. ★Equal Contribution

[J15] S. Mittal, **P. Pareek**, A. Verma (2024), "Convexified Flexibility Area Identification at TSO-DSO Interface" *IEEE Transactions on Industry Applications*, Early Access.

[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*, 20(5), pp. 7259-68.

[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.

[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*,228, 110083.

[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.

[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.

[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.

[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.

[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.

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

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

[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.

[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.

[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.

**Work-In-Progress Journal Papers**

[W3] B. Tan, T. Su, Y. Weng, K. Ye, **P. Pareek**, P. Vorobev, H. Nguyen, J. Zhao, D. Deka, "Gaussian Processes in Power Systems: Techniques, Applications, and Future Works". Pre-Print

[W2] **P. Pareek**, D. Deka, and S. Misra, "Graph-Structured Kernel Design for Power Flow Learning using Gaussian Processes". Pre-Print

[W1] **P. Pareek**, A. Jayakumar, C. Coffrin and S. Misra, "Demystifying Quantum Power Flow: Unveiling the Limits of Practical Quantum Advantage". Pre-Print

**Peer-Reviewed Conference Proceedings**

[C10] D Glover, **P. Pareek**, D Deka, A Dubey (2025), "Power Flow Approximations for Multiphase Distribution Networks using Gaussian Processes", *2025 IEEE PES General Meeting*, Accepted.

[C9] **P. Pareek**, K. Sunder, D. Deka and S. Misra (2024), "Learning from Less: Bayesian Neural Networks for Optimization Proxy using Limited Labeled Data", *NeurIPS 2024 Workshop on Bayesian Decision-making and Uncertainty*.

[C8] **P. Pareek**, L.P.M.I. Sampath, H. D. Nguyen and Y.S. E. Foo (2024), "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

- Michael Boateng, "Towards ACOPF Feasibility: Exploring the Combined Perspectives of DCOPF and ACPF Constraints," Ph.D. Candidate, *Georgia Tech*, (Advisor: Prof. Daniel Molzahn GTech). 2024-Ongoing
- 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

- Demystifying Quantum Power Flow: Is It Fast?, Grid Science Winter School, Santa Fe, USA — Jan. 2025
- Open Challenges in Power System Computations, Grid Science Winter School, Santa Fe, USA — Jan. 2025
- Introduction to Basics of Quantum Computing & An Application in Power Systems, Faculty Development Program (FDP), National Institute of Technology Warangal — Dec. 2024
- Learning From Less: Optimization Proxies under Time-Sample Constrained Settings, Los Alamos National Laboratory, New Mexico, USA — Dec. 2024
- Demystifying Quantum Power Flow: Is It Fast?, MOPTA, Lehigh University, Bethlehem, PA — Aug. 2024
- 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