Margi Shah, CEng

School of Engineering, Cardiff University, UK
E-mail: shahmr5@cardiff.ac.uk | LinkedIn

Education

Cardiff University Apr.2022 - July.2025
Ph.D. Candidate in Electrical Engineering.
Thesis: Quantification and Provision of Flexibility from Cyber Physical Industrial Energy Systems
Advisor: Prof. Yue Zhou & Prof. Jianzhong Wu & Dr Muditha Abeysekera

Charusat University June.2015 - June.2017
MTech. in Electrical Power Systems.
Thesis: Harmonic Elimination in Multi-level Inverter using Artificial Intelligence method
Advisor: Prof. Kartik Pandya

Gujarat Technological University May.2011 - May.2015
BTech. in Electrical Engineering.
Thesis: Next generation fire safe transformer in collaboration with industrial partner Schneider Electric

Research Interests

Power System Flexibility Utilisation; Data science in Energy systems; Energy markets

Professional Experience

Lecturer 2019 - 2022
Maharaja Sayajirao University of Baroda, India

- Developed and delivered courses in Electrical Measurement, Power Engineering, Circuits, and Digital Electronics
- Provided counselling, guidance, and practical project leadership for student support and engagement
- Managed administrative duties and actively engaged in community outreach, contributing to institutional objectives.

Junior Research Fellow 2017 - 2019
Charusat University, India
Supervisor: Prof. Yue Zhou & Prof Praghnesh Bhatt

- Led a Junior Research Fellow role in a collaborative Renewable Energy project involving CHARUSAT University, Cardiff University, UGVCL, and Sigil India Services. Oversaw project phases, including problem identification.
- Established a laboratory for showcasing the Doubly Fed Induction Generator (DFIG) wind energy conversion system. Developed prototypes, conducted diverse analyses, and studied DFIG operation modes.
- Presented a lab demonstration at a workshop on "System-Wide Impacts of Renewable Energy Integration," effectively communicating research relevance and potential applications to diverse stakeholders.

Research Outcomes

Award/Fellowships

[1] GECCO/CEC 2019 Competition Evolutionary Computation in Uncertain Environments: A smart grid application, third place for " GM_VNPSO " (Gauss Mapped Variable Neighborhood Particle Swarm Optimization) Algorithm at Wellington, New Zealand, June 2019.

[2] Fellowship in " Industry Academia Collaborative Project to address system wide impacts of Renewable Energy Sources in Engineering Program " with Cardiff University, UK

Publications

[1] **M. Shah**, Y. Zhou, J. Wu, and M. Mowbray, “A review of reinforcement learning based approaches for industrial demand response,” Jan. 23, 2024. doi: 10.46855/energy-proceedings-10959.

[2] **M. Shah** and K. S. Pandya, “Applied Computational Intelligence in Power Electronic Inverter to Mitigate Harmonics,” in Advances in Electric Power and Energy Infrastructure, vol. 608, A. Mehta, A. Rawat, and P. Chauhan, Eds., in Lecture Notes in Electrical Engineering, vol. 608. , Singapore: Springer Singapore, 2020, pp. 115–127. doi: 10.1007/978-981-15-0206-4_10.

Book Chapter

[1] J. Sarda, K. Pandya, and **M. Shah**, "Emerging Heuristic Optimization Algorithms for Expansion Planning and Flexibility Optimization in Sustainable Electrical Power Systems," in Advances in Control Systems and its Infrastructure, vol. 604, A. Mehta, A. Rawat, and P. Chauhan, Eds., in Lecture Notes in Electrical Engineering, vol. 604, Singapore: Springer Singapore, 2020, pp. 191–200. doi: 10.1007/978-981-15-0226-2_15.

Professional Development Activities

Volunteering

[1] CIGRE UK NGN Technical team lead
[2] CIGRE UK WiE Event coordinator
[3] NGN member at CIGRE UK C1 Technical Panel
[4] Representative of Post graduate research at CIREGS Research group at Cardiff University

Short term training program organised

[1] Coordinated the GUJCOST sponsored Short Term Training Program on "Challenges and Solutions in Electrical Power System" (December 2018).

Expert lectures delivered

[1] Expert lecture on "Particle Swarm Optimization Algorithm" in the GUJCOST sponsored Short Term Training Program.
[2] Expert lecture on "Overview of Optimization and its techniques."
[3] Expert lecture on "Optimal Power Flow using PSO."

Course certifications

[1] 32-bit Controller based on ARM CORTEX M4
[2] Machine learning with Python: Foundations
[3] Data Analytics in Python
[4] MATLAB Onramp
[5] Optimisation Onramp
[6] Presenting technical information with stories
[7] Designing a presentation
[8] PyTorch Tutorial- Neural Networks and Deep Learning in Python

Peer Reviews

Applied Energy

Computer Skills

-Optimization (Gurobi) -Data Analysis (Python, MATLAB) -Power System Analysis (ETAP, IPSA, Power factory)