Mohammad Kamran Ikram

PhD Candidate, Electrical Engineering | Sessional Lecturer | Academic Senator | Swinburne University
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Research Profile

PhD candidate at Swinburne University of Technology researching how electric vehicles and peer-to-peer energy sharing can support grid stability in the transition to net zero. Applied research experience as a research assistant at the Siemens–Swinburne Energy Transition Hub, including a CSIRO power system restoration project (grid-forming and grid-following inverters), and PSS® E power system modelling. Author of 5 journal articles, including a 2026 cover article in World Electric Vehicle Journal, 5 conference papers (2 accepted in 2026), 2 book chapters and 1 published patent, with 3 more journal manuscripts under review.

Education

PhD, Electrical Engineering — Apr 2024 – Apr 2028 (expected)
Swinburne University of Technology, Melbourne, Australia

Research: Peer-to-peer energy sharing and electric vehicle control, modelled in PSS® E. Fully funded by the Siemens–Swinburne Energy Transition Hub.

PhD enrolment (withdrawn; transferred to Swinburne) — Apr 2023 – Mar 2024
Federation University Australia

Master of Technology, Instrumentation and Control Engineering — 2018 – 2020
Aligarh Muslim University, India | GPA 8.69 / 10

Thesis: Development of a reactive power transducer for static VAr compensator (SVC) applications.

Bachelor of Technology, Electrical Engineering — 2013 – 2017
Aligarh Muslim University, India

Research Interests

EV integration and charging optimisation · Peer-to-peer energy sharing · Power system restoration and black start · Grid-forming and grid-following inverters · Smart grids and microgrids · Battery energy storage grid studies · Real and reactive power measurement

Research and Professional Experience

Research Assistant — Jul 2025 – present
Siemens–Swinburne Energy Transition Hub, Swinburne University of Technology, Melbourne, Australia

- Supporting research on EV participation, peer-to-peer energy trading and smart grid optimisation.
- Worked on the CSIRO AR-PST Stage 5 project (System Restoration and Black Start), Nov 2025 – Jul 2026: evaluated how grid-forming and grid-following inverters can work together to replace synchronous generators in System Restart Ancillary Services (SRAS).
- Findings published in *Energies* (2026) on the coordinated operation and stability limits of grid-forming and grid-following inverters in power system restoration.

PhD Candidate — Apr 2024 – present
Swinburne University of Technology, Melbourne, Australia

- Developed a two-stage, fuzzy-informed optimisation framework that reduces peak load through hierarchical EV charging management (Journal of Energy Storage, 2025).
- Designed a state-of-charge-aware EV charging strategy and studied its effect on distribution network voltage (IEEE ETFG 2025), and the impact of charging station placement on hybrid microgrids (IEEE AUPEC 2025).
- Reviewed the role of EVs in peer-to-peer energy networks; selected as the cover article of World Electric Vehicle Journal, August 2026.

Research Associate — Jan 2021 – Mar 2023
Department of Electrical Engineering, Aligarh Muslim University, India | UGC DRS project, Government of India

- Designed and experimentally validated transducer circuits and industrial prototypes for measuring real and reactive power, for voltage control and stability of smart grids and microgrids.

- Work led to two journal papers (IEEE Sensors Journal; Sensors and Actuators A) and a published patent.

Publications

Journal articles

J1 **M. K. Ikram**, P. A. Hosseinabadi, M. Seyedmahmoudian, S. Mekhilef, and A. Stojcevski, "Coordinated operation and stability limits of grid-forming and grid-following inverters in power system restoration," *Energies*, vol. 19, no. 16, p. 3875, 2026. doi:10.3390/en19163875

J2 **M. K. Ikram**, M. Seyedmahmoudian, G. Thirunavukkarasu, S. Mekhilef, A. Stojcevski, and J. Moreira, "A review of electric vehicle integration in peer-to-peer energy networks," *World Electric Vehicle Journal*, vol. 17, no. 8, p. 383, 2026. doi:10.3390/wevj17080383 **Cover article**

J3 **M. K. Ikram**, M. Seyedmahmoudian, G. S. Thirunavukkarasu, S. Mekhilef, and A. Stojcevski, "A two-stage fuzzy-informed optimization framework for reduced peak load and hierarchical EV management in smart grids," *Journal of Energy Storage*, vol. 136, p. 118308, 2025. doi:10.1016/j.est.2025.118308

J4 **M. K. Ikram**, M. S. J. Asghar, M. Seyedmahmoudian, S. Mekhilef, A. Stojcevski, and A. Al-Assaf, "Advanced real and reactive power measurement using analog multiplier and phase-controlled switching technique," *Sensors and Actuators A: Physical*, vol. 378, p. 115812, 2024. doi:10.1016/j.sna.2024.115812

J5 **M. K. Ikram**, S. M. Amrr, M. S. J. Asghar, T. Islam, and A. Iqbal, "Voltage independent reactive current based sensor for static VAr control applications," *IEEE Sensors Journal*, vol. 23, no. 9, pp. 10023–10031, 2023. doi:10.1109/JSEN.2023.3258696

Journal manuscripts under review

R1 **M. K. Ikram** et al., "SoC-aware hierarchical EV charging and decentralized Volt–VAr support for voltage regulation in distribution networks," *IEEE Transactions on Industry Applications*, under revision (first round), 2026.

R2 **M. K. Ikram***, N. A. Arif*, M. Seyedmahmoudian, S. Mekhilef, and A. Stojcevski, "Coordinated operation of electric vehicles and battery energy storage systems for active distribution network: A review," *Journal of Energy Storage*, under revision (first round), 2026. (*Equal contribution)

R3 **M. K. Ikram**, M. Seyedmahmoudian, N. A. Arif, S. Mekhilef, and A. Stojcevski, "Executable charging and vehicle-to-grid schedules for multi-station EV fleets with distribution network constraints," SSRN preprint, under review, 2026. doi:10.2139/ssrn.7602178

Conference papers

C1 **M. K. Ikram**, M. Seyedmahmoudian, N. A. Arif, S. Mekhilef, and A. Stojcevski, "Spatial EV charging demand sharing in radial distribution feeders using an inverse-sensitivity approach," *IEEE Texas Power and Energy Conf. (TPEC) 2026*, accepted.

C2 N. A. Arif, S. Mekhilef, **M. K. Ikram**, M. Seyedmahmoudian, and A. Stojcevski, "Lineage-aware state-of-health estimation of lithium-ion batteries with second-life generalization," *Proc. IEEE PES Australasian Universities Power Engineering Conf. (AUPEC)*, Hobart, Australia, Nov. 2026, accepted.

C3 **M. K. Ikram** et al., "Impact of an optimal SoC-aware EV charging strategy on the voltage regulation of distribution networks," in *Proc. IEEE Int. Conf. Energy Technologies for Future Grids (ETFG)*, Wollongong, Australia, Dec. 2025. doi:10.1109/ETFG61999.2025.11401024

C4 **M. K. Ikram** et al., "Modeling and analysis of EV charging station placement impacts on a hybrid microgrid," in *Proc. IEEE Australasian Universities Power Engineering Conf. (AUPEC)*, Brisbane, Australia, 2025. doi:10.1109/AUPEC66173.2025.11219464

C5 M. S. J. Asghar, **M. K. Ikram**, M. Sarfraz, and T. Islam, "A novel method for the measurement of active and reactive power by sample-and-hold," in *Proc. IEEE Int. Conf. Computing, Communication and Automation (ICCCA)*, Arad, Romania, 2021, pp. 424–428. doi:10.1109/ICCCA52192.2021.9666395

Book chapters

B1 S. Khan, M. Sufian, **M. K. Ikram**, and M. S. Khan, "A cloud-based innovation for establishing environmental surveillance: The smart air quality monitoring system," in *SIGMAA 2023*, Springer, vol. 1460, 2024. doi:10.1007/978-981-97-6349-8_20

B2 **M. K. Ikram**, K. M. K. Senan, M. Mustaqeem, and M. Sarfraz, "An intelligent and effective cyber-secured smart-home automation system with embedded AI," in *ICCAI 2021*, Springer, vol. 435, 2022, pp. 153–163. doi:10.1007/978-981-19-0976-4_13

Patent

P1 **M. K. Ikram**, "Measurement of real and reactive power using controlled rectifiers," Indian Patent Publication No. 202111049908 A, published in the *Official Journal of the Patent Office*, Issue 46/2021, Nov. 2021.

Teaching

Sessional Lecturer Aug 2025 – present
Swinburne University of Technology, Melbourne, Australia

- Design of Smart Power Grids (EEE80020 postgraduate; EEE40016 undergraduate): smart grid technologies, renewable integration and energy management. Developed course materials, lab exercises and assessments.
- Engineering Technologies with Indigenous Context (ENG10006): engineering from Aboriginal perspectives.

MATLAB Trainer Oct 2021 – May 2022
Arena Multimedia, Aligarh, India

- Trained more than 120 undergraduate students in MATLAB, Simulink and electrical engineering applications.

Teaching Assistant Feb 2019 – May 2020
Aligarh Muslim University, India

- Supervised instrumentation and control, electric machines and microprocessor labs for cohorts of up to 120 students.

Awards and Recognition

Cover article, World Electric Vehicle Journal, Vol. 17, Issue 8 2026
Siemens–Swinburne Energy Transition Hub PhD Scholarship (fully funded) 2024 – 2027
National GATE Scholarship, MHRD, Government of India 2018 – 2020
GATE Electrical Engineering: 95th percentile, ranked 5,059 of 93,526 candidates.

Service and Leadership

Academic Senator (elected HDR student representative) Jan 2026 – present
Swinburne University of Technology

- Represents postgraduate research students in university Senate and committee discussions on research and academic policy.

Technical Chair
International academic conference

Conference Presentations

IEEE ETFG 2025, Wollongong, Australia Dec 2025
IEEE AUPEC 2025, Brisbane, Australia 2025
Energy Consortium, Melbourne, Australia Nov 2024
IEEE ICCCA 2021, Arad, Romania Dec 2021
Springer ICCAI 2021, Mathura, India Nov 2021

Professional Training

- PSS® E industry training, Modules 1 and 2, Siemens–Swinburne Energy Transition Hub
- PSS® SINCAL industry training, Siemens–Swinburne Energy Transition Hub
- Solar Rooftop Grid Engineer, National Institute of Solar Energy, India (2019)

Skills

Power system simulation: PSS® E, PSS® SINCAL, MATLAB/Simulink

Optimisation and automation: Python (NumPy, Pandas, CVXPY), IBM ILOG CPLEX

Hardware and testing: Power electronics, sensor interfacing, analog circuits, electronic system design

Data and documents: Python (Matplotlib), Excel, LaTeX

Languages: English (full professional), Urdu and Hindi (native)

Referees

Available on request.