OWAIS AHMAD

PhD Candidate | Mechanical Engineering | Energy Systems

University of Victoria | owaistoru.com | orcid.org/0000-0002-5445-7212

Mechanical Engineering PhD candidate with a BSc in Electrical Engineering (Power Systems), an MSc in Renewable Energy Engineering and more than two years of solar-PV project engineering. I develop and verify full-year and multi-year energy-system models in Python, C++ and MATLAB.

RESEARCH & ENGINEERING EXPERIENCE

PhD Researcher, Energy Systems and Scientific Computing | Jan 2023 - present

University of Victoria | Victoria, BC

- Develop physics-based and data-driven models in Python, C++ and MATLAB for renewable generation, storage, hydrogen systems and operational control, including 8,760-hour and multi-year chronological simulations.
- Compare forecast-informed model predictive control with conventional load-following for remote hybrid microgrids, quantifying reliability, fuel use, emissions, storage utilization, lifecycle cost and robustness to forecast quality.
- Model offshore renewable-to-hydrogen systems: wind generation, PEM electrolysis, hydrogen buffering, liquefaction, cryogenic LH2 storage, weather-constrained marine transfer, vessel logistics and project economics.
- Use sensitivity and uncertainty analysis, regression testing, mass and energy balance checks and structured validation to keep results traceable and physically consistent; prepare peer-reviewed manuscripts, figures and technical documentation.

Research Assistant, Power for People (Northern BC analysis) | Apr 2026 - Sep 2026

University of Victoria | Victoria, BC

- Analysed multi-year Census, employment, industry and energy-transition datasets for Northern British Columbia in Python and Excel, with emphasis on regional labour-market structure and transition vulnerability.
- Built reproducible data-processing, comparison and visualization workflows; documented assumptions, data provenance and methods; prepared publication-ready figures, tables and evidence summaries for interdisciplinary review.

Project Engineer, Solar PV | 2 Jan 2021 - 16 Jan 2023

Voltric Energy (Pvt.) Ltd. | Peshawar, Pakistan

- Supported commercial and distributed solar-PV projects across the lifecycle: site information review, load assessment, system sizing, design documentation, procurement coordination, installation, commissioning, performance verification and O&M.
- Prepared and reviewed single-line diagrams, bills of quantities, tender packages, equipment selections and technical drawings using PVsyst, AutoCAD, Excel and engineering calculations; investigated faults and supported corrective actions in the field.

Renewable Energy Systems Research | 2018 - 2022

Center for Advanced Studies in Energy, UET Peshawar | Pakistan

- Simulation, modelling, quantitative analysis, literature review and technical reporting for hybrid renewable systems, decentralized power, solar-PV optimization and smart-grid integration.

Power Engineer | 2017 - 2018

Huawei Technologies Pvt. Ltd. (AMS/CS) | Pakistan

- Supported installation, maintenance and performance optimization of telecom-site power infrastructure and PowerCube systems, coordinating field logistics and resolving technical issues under operational time constraints.

EDUCATION

PhD, Mechanical Engineering (candidate) | 2023 - 2027 (expected)

University of Victoria | British Columbia, Canada

- Candidacy examination passed in April 2025. Research: renewable energy systems, offshore hydrogen and liquid hydrogen, remote microgrids, storage, forecasting, optimization, control and techno-economic analysis.

MSc, Renewable Energy Engineering | 2018 - 2020

University of Engineering and Technology, Peshawar | Pakistan

- Energy-system modelling and optimization, integration of renewables into smart grids, electrical machines, power electronics and solar-PV systems.

BSc, Electrical Engineering (Power Systems) | 2013 - 2017

University of Engineering and Technology, Peshawar (Mardan Campus) | Pakistan

- Graduated with distinction. Power systems, electrical machines, control systems, power electronics, communications and engineering computation.

TEACHING AND ACADEMIC SUPPORT

Teaching Assistant, Faculty of Engineering and Computer Science, University of Victoria | 2023 - present

I lead and support labs and tutorials, mark assignments and examinations, troubleshoot circuits and engineering experiments, explain technical concepts, maintain course records and give one-to-one feedback to students.

Courses: ENGR 120, ENGR 121, ECE 250, ECE 365, ECE 370, CSC 230, MECH 240, MECH 360, MECH 390, MECH 455

TECHNICAL SKILLS

Programming and scientific computing

Python | NumPy | pandas | matplotlib | C++20 | MATLAB | pybind11 | CMake | PySide6 (Qt) | Git and GitHub | GitHub Actions

Energy modelling and simulation

MATLAB/Simulink (SimPowerSystems) | HOMER Pro | OpenDSS | PVsyst | EasyPower | 8,760-hour simulation | Multi-year time series

Optimization and control

Model predictive control | MILP | Multi-objective optimization | NSGA-II and NSGA-III | Sensitivity analysis | Uncertainty analysis

Power and renewable engineering

Power systems | Distributed generation | Microgrids | Solar-PV design | Energy storage | Electrical machines | Power electronics | Single-line diagrams | Bills of quantities

Hydrogen and offshore systems

PEM electrolysis | Hydrogen buffering and compression | Liquefaction | Cryogenic LH2 storage | Marine logistics | Metocean-constrained operability

Data, tools and documentation

Excel | AutoCAD | SQLite and Flask (familiarity) | CSV and JSON workflows | Data cleaning and QC | Technical writing | Publication figures

SELECTED PUBLICATIONS

1. Ahmad, O. , Crawford, C., & Ishaq, H. (2026). Nonlinear operability thresholds in offshore green hydrogen production: Multi-objective system design under metocean uncertainty. International Journal of Hydrogen Energy , 277, 157530. DOI

2. Ahmad, W., Ahmad, O. , Ahmad, A., & Khan, K. (2022). Decentralized electrical power system in Pakistan. International Journal of Engineering Works , 9(2), 47-51. DOI

3. Ahmad, O. , Ahmad, A., Ahmad, W., & Khan, K. (2021). Design, performance and feasibility assessment of solar PV system for irrigation. International Journal of Engineering Works , 8(12), 294-297. DOI

4. Ahmad, A., Ahmad, O. , Ahmad, W., & Khan, K. (2021). Rooftop PV systems development in Khyber Pakhtunkhwa: Barriers and smart policy recommendations. International Journal of Engineering Works , 8(12), 298-304. DOI

AWARDS, TRAINING & LANGUAGES

Scholarships and honours

- Fully funded PhD scholarship, Higher Education Commission (HEC) of Pakistan

- MSc full-fee scholarship and fee-waiver support
- BSc in Electrical Engineering, graduated with distinction

Research-security training (2025)

- Introduction to Research Security
- Cyber Security for Researchers
- Safeguarding Your Research Partners with Open Source Due Diligence

Languages

- English
- Urdu
- Pashto