

Burhan U Din Abdullah

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[Google Scholar](#) — [LinkedIn](#) — [GitHub](#)

65 Citations — h-index: 4 — i10-index: 2



Professional Summary

Researcher in power systems, renewable energy integration, and artificial intelligence applications for modern electric grids. Expertise spans photovoltaic systems, microgrids, grid stability, optimization, forecasting, and techno-economic analysis. Research focuses on AI-driven decision support, agent-based modeling, cyber-physical resilience, and intelligent infrastructure planning for renewable-rich and low-inertia power systems. Published in leading venues including *Energies (Q1)*, *Frontiers in Energy Research*, IEEE conferences, and Taylor & Francis publications.

Research Areas

- Power Systems
- Artificial Intelligence for Power Systems
- Renewable Energy Integration
- Microgrids and Distributed Energy Resources
- Grid Stability and Resilience
- Cyber-Physical Energy Systems
- Energy Infrastructure Planning
- Techno-Economic Analysis

Education

Ph.D. in Electrical Engineering Jul 2025

Sharda University, India

Dissertation: *Intelligent Control and AI-Assisted Optimization of Grid-Connected Photovoltaic Systems for Resilient and Sustainable Energy Infrastructure*

M.Tech. in Power Systems

Aug 2020

J. C. Bose University of Science and Technology, India

Thesis: *Performance Assessment of Hybrid Renewable Systems in Grid-Connected and Islanded Operation*

B.Tech. in Electrical and Renewable Energy Engineering

Aug 2015

Baba Ghulam Shah Badshah University, India

Thesis: *Automation for Residential Buildings*

Professional Experience

Open Source Research Contributor – PowerMCP

Jan 2026 – Present

Harvard John A. Paulson School of Engineering and Applied Sciences, USA

- Contribute to agent-based intelligent power system modeling and AI-assisted decision-support systems.

- Develop validation, testing, and error-handling modules for scalable simulations.
- Support transparent and reproducible infrastructure modeling workflows.

Postdoctoral Researcher

Nov 2025 – Apr 2026

Indian Institute of Science (IISc), Bengaluru, India

- Led techno-economic modeling for the Namma Metro Blue Line energy infrastructure project.
- Developed reliability assessment and scenario-based infrastructure planning models.
- Integrated engineering, economic, and regulatory constraints into decision-support frameworks.
- Collaborated across engineering, economics, and policy domains.

Business Development Manager – Renewable Energy

Feb 2025 – Aug 2025

Helium Four Solar Pvt. Ltd., India

- Conducted technical feasibility and sustainability assessments for solar projects.
- Supported project planning aligned with clean-energy transition strategies.

Teaching Assistant

Mar 2021 – Sep 2023

Sharda University, India

- Assisted teaching in Power Systems and Renewable Energy courses.
- Mentored undergraduate research projects in smart grids and energy analytics.

Open Research and Software

Aegis-Grid (Lead Developer)

- Open-source framework for secure and resilient cyber-physical power systems.
- Designed multi-layer monitoring and validation architectures for secure grid communication.
- Developed adaptive threshold cryptography and entropy-based anomaly detection mechanisms.
- Implemented agent-based resilience and coordination strategies for intelligent energy systems.

Aegis-Consensus-Lab

- Developed dynamic trust-weighted consensus mechanisms for distributed cyber-physical systems.
- Simulated adversarial and fault-tolerant operating environments.
- Evaluated decentralized coordination and resilience strategies.

PowerMCP (Contributor)

- Contributed validation and testing modules for multi-agent power system simulations.
- Supported reproducible AI-driven infrastructure modeling tools.

Technical Skills

Programming and Data Science

Python, PyTorch, MATLAB, Simulink, R

Power System Analysis and Simulation

DIgSILENT PowerFactory, PSCAD, PowerWorld Simulator, Grid Stability Analysis, Renewable Energy Integration, Microgrid Modeling

Artificial Intelligence and Analytics

Machine Learning, Deep Learning, Optimization, Probabilistic Modeling, Time-Series Forecasting, Scenario Analysis, Decision Support Systems

Research Tools

Git, GitHub, Jupyter Notebook, LaTeX

Methods

Techno-Economic Analysis, Reliability Assessment, Infrastructure Planning, Agent-Based Modeling, Multi-Agent Systems

Publications

Peer-Reviewed Journal Articles

1. Abdullah, B.U.D., Khanday, S.A., Islam, N.U., Lata, S., Fatima, H., and Nengroo, S.H. (2024). Comparative analysis using multiple regression models for forecasting photovoltaic power generation. *Energies*, 17(7), 1564.
2. Abdullah, B.U.D., Lata, S., Jaiswal, S.P., Bhadoria, V.S., Fotis, G., Santas, A., et al. (2023). A hybrid artificial ecosystem optimizer and incremental-conductance MPPT-controlled grid-connected PV system. *Energies*, 16(14), 5384.
3. Abdullah, B.U.D., Dhar, S.L., Jaiswal, S.P., Gulzar, M.M., Alqahtani, M., and Khalid, M. (2025). Hybrid MPPT control using hybrid pelican optimization algorithm for PV connected grid. *Frontiers in Energy Research*, 12, 1505419.

Conference Papers and Scholarly Contributions

4. Abdullah, B.U.D., and Lata, S. (2022). IoT-based solar monitor system. *International Conference on Computing, Communication and Intelligent Systems*.
5. Abdullah, B.U.D., Jaiswal, S.P., Lata, S., Dulal, S., and Shrivastava, V. (2022). Performance and Reliability Investigation of Practical Microgrid with PV Units. In *Artificial Intelligence for Solar PV Systems* (pp. 255–288).
6. Abdullah, B.U.D., Lata, S., Varshney, T., and Deb, S. (2024). IoT-based PV monitoring system: Need, architecture, and future directions. In *The Future of IoT with Automation in Engineering* (pp. 83–102).
7. Abdullah, B.U.D., and Dhar, S.L. (2023). Application of AI in MPPT for Solar Power Systems: A Review. *International Conference on Applied and Industrial Mathematics*.
8. Abdullah, B.U.D., and Jaiswal, S.P. (2021). A Review of Recent Developments in Hybrid PV System. *Recent Developments in Engineering and Technology*.

Manuscripts Under Review

1. **A Time-Bounded, Fail-Secure Communication Architecture for Post-Quantum Smart Grid Systems.** Under Review.
2. **Adaptive Epistemic Governance and Predictive Synchronization Containment under Byzantine Consensus Dynamics.** Submitted.
3. **Cross-Layer Cyber-Physical Anomaly Detection for Coordinated SCADA Attacks in IEEE Benchmark Power Systems.** Submitted to *IEEE Transactions on Smart Grid*.

Academic Service

- Reviewer, Springer Nature
- Reviewer, Taylor & Francis
- Reviewer, Frontiers

- Reviewer, IEEE Young Professionals
- Reviewer, Elsevier
- Mentor, Student Energy

Certifications

- IBM Data Science Professional Certificate
- Artificial Intelligence Foundations
- AI Project Management
- Optimization Techniques in Renewable Energy and Power Systems (NSIC, 2023)
- Electric Power Systems
- Internet of Things
- Big Data and Hadoop Foundations
- Non-Conventional Energy Resources

Languages

English (Fluent), Urdu (C1), Hindi (B1)

References

References available upon request.