

# Dr. Obaid Ur Rehman, Ph.D.

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📄 <https://scholar.google.com.pk/citations?user=ZIpcD2sAAAAJ&hl=en>

## Education

- 2016 – 2022 **Ph.D. Electrical Engineering**, COMSATS University Islamabad.  
Specialization/Research Area: *Power system operations and optimization.*  
Thesis title: *Impact of High Solar Photovoltaic Penetration on Power System Operations.*  
Supervisor: *Prof. Dr. Shahid Ahmed Khan.*
- 2011 – 2013 **M.S. Electrical Engineering**, COMSATS University Islamabad.  
Specialization/Research Area: *Wireless Networks.*  
Thesis title: *Energy Efficiency and Location Tracking in Wireless Sensor Networks.*  
Supervisor: *Prof. Dr. Nadeem Javaid*
- 2006 – 2010 **BSc. Electrical Engineering**, Riphah International University Islamabad.  
Thesis title: *GSM based Weather Monitoring System.*  
Supervisor: *Mr. Qaisar Alvi*

## Employment History

- 2013 – . . . . . **Lecturer.** Department of Electrical and Computer Engineering, COMSATS University Islamabad, Pakistan.
- 2012 – 2013 **Research Associate.** Department of Electrical and Computer Engineering, COMSATS University Islamabad, Pakistan.

## Research Interests and Experience

### 📌 Researcher Interests:

- **Demand response optimization for grid reliability:** Implement energy flexibility strategies for buildings, clusters, and communities in interaction with electric grid.
- **Supply side Optimization:** Develop innovative research work in deterministic, stochastic and data driven optimization models in the context of distribution and transmission grid operations (economic dispatch and optimal power flow).
- **Renewable energy integration in power systems:** Model different sources of uncertainty (renewable energy and demand) in power systems planning and operation.
- **AI applications in power system operation:** Develop AI-enabled OPF algorithms to optimize power flow, minimize generation costs, and maintain system stability. Implement AI techniques to facilitate the integration of renewable energy sources (such as wind and solar) into power systems by forecasting their output.

## Research Interests and Experience (continued)

- **Research Experience:** Doctoral Researcher, Department of Electrical and Computer Engineering, COMSATS University Islamabad, Pakistan. [2016-2022]
  - Conducted research on optimization techniques, prediction models and control algorithms to formulate the model predictive control (MPC) problems regarding building's climate control and grid frequency control.
  - Examined the literature on research and field studies in the context of smart buildings as a grid resource.
  - Developed demand response enabled building-to-grid (B2G) optimization frameworks for distribution and transmission networks operations control.

## Teaching and Supervisory Experience

- **Instructor, Power System Operation and Control (Undergraduate course):** Department of Electrical and Computer Engineering, COMSATS University Islamabad, Pakistan. [Spring 2024]
  - Prepared class lectures focusing on the steady state operations such as Economic dispatch, Unit commitment, Hydro-thermal scheduling.
  - Mathematical modeling of the generation control in single and multi area power system.
- **Instructor, Advance Power System Analysis (Graduate course):** Department of Electrical and Computer Engineering, COMSATS University Islamabad, Pakistan. [Fall 2023]
  - Prepared class lectures and research activities focusing on the steady state operations of power system and its implementation on Power World Simulator.
  - Explained challenging concepts using planned lessons, assignments and targeted discussions.
- **Instructor, Power Distribution and Utilization (Undergraduate course):** Department of Electrical and Computer Engineering, COMSATS University Islamabad, Pakistan. [Fall 2018, Spring 2023]
  - Prepared class lectures and lab activities focusing on the design and analysis of substations, primary and secondary distribution systems; power factor correction and voltage control technologies in distribution system;
- **Instructor, Power Transmission (Undergraduate course):** Department of Electrical and Computer Engineering, COMSATS University Islamabad, Pakistan. [Fall 2022, Spring 2022, Fall 2021]
  - Prepared class lectures and conducted lab demonstrations focusing on the modeling of transmission lines series and shunt parameters; Performance evaluations of short medium and long transmission lines; mechanical design of transmission line.
- **Instructor, Power Generation (Undergraduate course):** Department of Electrical and Computer Engineering, COMSATS University Islamabad, Pakistan. [Fall 2022, Spring 2021]
  - Conducted class lectures targeting the cyclic operation and preliminary design of conventional power plants including steam, diesel and gas power plants; designing of renewable power plants mainly include: hydro, solar and wind systems.

## Teaching and Supervisory Experience (continued)

■ **Other Courses include:** Electric Circuit Analysis-1, Analog Communication, Digital Communication, Data Communication and Computer Networks, Electrical Measurement and Instrumentation, Electronics-2.

■ **Undergraduate Supervisor:** Department of Electrical and Computer Engineering, COMSATS University Islamabad, Pakistan. [Fall, 2013 ... to-date]

- Mentored more than 20 undergraduate students in the fields of power distribution and transmission systems operation and optimization, Smart grids and wireless sensor networks
- Guided the students in preparation and presentation of research findings

**Graduate Mentor:** Department of Electrical and Computer Engineering, COMSATS University Islamabad, Pakistan. [Spring, 2022 ... to-date]

- Co supervised two graduate students in preparation and presentation of research findings on economic dispatch and optimal power flow studies in modern power systems.

## Research Publications

### Journal Articles



- 1 M. S. Ali, L. Wang, H. Alquhayz, O. U. Rehman, and G. Chen, "Performance improvement of three-phase boost power factor correction rectifier through combined parameters optimization of proportional-integral and repetitive controller," *IEEE Access*, vol. 9, pp. 58 893–58 909, 2021.
- 2 O. U. Rehman, S. A. Khan, and N. Javaid, "Decoupled building-to-transmission-network for frequency support in pv systems dominated grid," *Renewable Energy*, vol. 178, pp. 930–945, 2021.
- 3 O. U. Rehman, S. A. Khan, and N. Javaid, "Impact of photovoltaic self-consumption curtailment on building-to-grid operations," *International Journal of Electrical Power & Energy Systems*, vol. 124, p. 106 374, 2021.
- 4 M. Shakir, O. U. Rehman, M. Rahim, *et al.*, "Performance optimization of priority assisted csma/ca mechanism of 802.15. 6 under saturation regime," *Sensors*, vol. 16, no. 9, p. 1421, 2016.

### Conference Proceedings






- 1 M. Ahmad, N. Javaid, I. A. Niaz, S. Shafiq, O. U. Rehman, and H. M. Hussain, "Application of bird swarm algorithm for solution of optimal power flow problems," in *Complex, Intelligent, and Software Intensive Systems: Proceedings of the 12th International Conference on Complex, Intelligent, and Software Intensive Systems (CISIS-2018)*, Springer, 2019, pp. 280–291.
- 2 O. Rehman, S. Khan, M. Malik, N. Javaid, S. Javaid, and K. Aurangzeb, "Optimal scheduling of distributed energy resources for load balancing and user comfort management in smart grid," in *Proceedings of the International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies, Zallaq, Bahrain, 2018*, pp. 18–20.
- 3 A. Yasmeen, N. Javaid, O. U. Rehman, H. Iftikhar, M. F. Malik, and F. J. Muhammad, "Efficient resource provisioning for smart buildings utilizing fog and cloud based environment," in *2018 14th International Wireless Communications & Mobile Computing Conference (IWCMC)*, IEEE, 2018, pp. 811–816.
- 4 B. Manzoor, N. Javaid, O. Rehman, *et al.*, "Energy aware error control in cooperative communication in wireless sensor networks," in *Proceedings of the 2013 Research in Adaptive and Convergent Systems*, 2014, pp. 254–260.

- 5 N. Javaid, O. Rehman, N. Alrajeh, Z. A. Khan, B. Manzoor, and S. Ahmed, "Aid: An energy efficient decoding scheme for ldpc codes in wireless body area sensor networks," vol. 21, Elsevier, 2013, pp. 449–454.
- 6 B. Manzoor, N. Javaid, O. Rehman, *et al.*, "Q-leach: A new routing protocol for wsns," vol. 19, Elsevier, 2013, pp. 926–931.
- 7 O. Rehman, N. Javaid, B. Manzoor, A. Hafeez, A. Iqbal, and M. Ishfaq, "Energy consumption rate based stable election protocol (ecrsep) for wsns," vol. 19, Elsevier, 2013, pp. 932–937.
- 8 O. ur Rehman, N. Javaid, A. Bibi, and Z. A. Khan, "Performance study of localization techniques in wireless body area sensor networks," in *2012 IEEE 11th International Conference on Trust, Security and Privacy in Computing and Communications*, IEEE, 2012, pp. 1968–1975.

## Skills

- Softwares     MATLAB, AMPL, Power World Simulator, PSS/E, EnergyPlus, LTspice, Labview, Packet Tracer, L<sup>A</sup>T<sub>E</sub>X
- Misc.         Academic research, teaching, training, Project Supervision L<sup>A</sup>T<sub>E</sub>X typesetting and publishing.

## Certifications and Scholarships

- 2024         **Optimization methods for energy systems studies.** Awarded by Technical University of Denmark (DTU).
- 2010         **Industrial automation using Programmable logic controller.** Awarded by Skill Development Council, Islamabad .
-  **FPGA based digital design using Verilog.** Awarded by Skill Development Council, Islamabad.
- 2016-2020    **Awarded by Higher Education of Pakistan scholarship for P.hD in Electrical Engineering.**
- 2006-2010    **Awarded by Punjab government talent scholarship for BSc. Electrical Engineering.**

## Referees

**Prof. Dr. Shahid A. Khan**  
*Former Dean, Department of  
 Electrical and Computer Engineering,  
 COMSATS University Islamabad  
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**Dr. Fawad Zaman**  
*Associate Professor, Department of  
 Electrical and Computer Engineering,  
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**Dr. Babar Rasheed**  
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 University of Gloucestershire  
 Cheltenham, UK.  
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