Obaid Ur Rehman, Ph.D.

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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*

Research Interests

- 🔖 **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).**
- 🔖 **Model different sources of uncertainty (renewable energy and demand) in power systems planning and operation.**
- 🔖 **Implement energy flexibility strategies for buildings, clusters, and communities in interaction with smart grids and dynamic pricing of electricity.**

Research Experience

2016 – 2022 🔖 **Doctoral Researcher.** Department of Electrical and Computer Engineering, COMSATS University Islamabad, Pakistan.

- 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.

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

Teaching and Supervisory Experience

- **Instructor, Power Distribution and Utilization**: 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;

  - Created and graded course assessments to ensure students understood material and stayed on track.

- **Instructor, Power Transmission**: 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.

  - Test challenging concepts using assignments and complex engineering problems.

- **Instructor, Power Generation**: 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.

  - Explained challenging concepts using planned lessons, assignments and targeted discussions.

- **Other Courses include: Electric Circuit Analysis-1, Analog Communication, Digital Communication, Data Communication and Computer Networks, Electrical Measurement and Instrumentation, Electronics-2,** : Department of Electrical and Computer Engineering, COMSATS University Islamabad, Pakistan. [Fall, 2013- Fall, 2022]

- **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.

Employment History

2013 – ···· **Lecturer.** Department of Electrical and Computer Engineering, COMSATS University Islamabad, Pakistan.

Employment History (continued)

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

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

Languages	◫	Strong reading, writing and speaking competencies for English and Urdu.
Software	◫	MATLAB, AMPL, LTspice, EnergyPlus, PSS/E, Labview, Packet Tracer, LaTeX
Misc.	◫	Academic research, teaching, training, LaTeX typesetting and publishing.

Awards and Certifications

2006-2010	◫	**Awarded with Punjab government talent scholarship for BSc. Electrical Engineering**.
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.

Referees

Prof. Dr. Shahid A. Khan
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Dr. Babar Rasheed
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