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Dr. Umar Saleem

Nationality: Pakistani **Date of birth:** 06/06/1989 **Gender:** Male

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OBJECTIVE STATEMENT

Key Qualifications and Research Interests

A highly motivated Engineering Technologist with 5+ years of expertise in electrical power systems, high-voltage operations (220kV/132kV), power electronics, control systems, and AI-driven prognostics for energy systems. Dedicated to advancing resilient, energy-efficient smart grids and renewable integration.

Key Qualifications

- **Research Excellence:** First-author publications on battery SOH/RUL estimation and energy optimization in *Electrochimica Acta*, *Energies*, and *Computers & Electrical Engineering*.
- **Modeling & Simulation:** Proficient in MATLAB, Simulink, OPAL-RT, and dSPACE for real-time system modeling and hardware-in-the-loop testing.
- **AI & Prognostics:** Developed machine learning models for condition monitoring, fault diagnosis, and RUL prediction in energy systems.
- **Field Expertise:** Strong background in substation protection, transformer testing, and high-voltage diagnostics.
- **Renewables & Microgrids:** Specialized in PV system performance and smart microgrid design for cold and remote regions.
- **Team Collaboration:** Experienced in cross-functional research and industry projects supporting clean energy transition.

Research Interests

- Prognostics & Health Management (PHM) of aerospace and electric propulsion systems
- Advanced power conversion and control using power electronics
- Smart grids and energy management under uncertainty
- AI/ML for energy storage diagnostics and RUL/SOH prediction
- Real-time state estimation of power distribution systems

EDUCATION AND TRAINING

Ph.D Electrical Engineering

Northwestren Ploytechnical University [30/09/2019 – 21/06/2025]

City: Xi'an | **Country:** China | **Website:** https://en.nwpu.edu.cn/ | **Field(s) of study:** Engineering | **Final grade:** 82 % | **Number of credits:** 20 | **Thesis:** Prognestic and Health management of Aircraft Electric System

MS in Electrical (Power) Engineering

The Superior College [15/10/2015 – 03/03/2018]

City: Lahore | **Website:** https://www.superiorcolleges.edu.pk/lahore/ | **Final grade:** GPA of 3.49/4 | **Number of credits:** 30 | **Thesis:** Fault Detection and Diagnosis of Transmission Lines using Wavelet Transform-Based Techniques

Bachelor of Technology (Electrical Hons)

The Islamia University of Bahawalpur [18/11/2012 – 15/02/2015]

City: Bahawalpur | **Country:** Pakistan | **Website:** https://www.iub.edu.pk/ | **Final grade:** GPA 3/4 | **Thesis:** Micro Controller Based Automation System

Bachelor of Technology (Electrical)

The Islamia University of Bahawalpur [15/10/2009 – 27/02/2012]

City: Bahawalpur | **Country:** Pakistan | **Website:** https://www.iub.edu.pk/ | **Final grade:** GPA 3/4

Diploma of Associate Engineering (Electrical Technology)
Punjab Board of Technical Education

City: Lahore | **Country:** Pakistan | **Website:** https://www.pbte.edu.pk/ | **Final grade:** Graduated with merit, scoring 73%

WORK EXPERIENCE

Northwestern Polytechnical University, Civil Aviation College (Taicang Campus) China.

Postdoctoral Researcher (Prognostics & Health Management of Aircraft Electrical Systems)

[11/07/2025 – Current]

- Conducting advanced research on Prognostics and Health Management (PHM) of key aircraft electrical components, including lithium-ion batteries, IGBT modules, and aero-engines.
- Developing and implementing deep learning models (CNN, BiLSTM, Transformer, GRU, and hybrid architectures) for State of Health (SOH) and Remaining Useful Life (RUL) prediction.
- Designing and validating novel diagnostic frameworks integrating simulation (MATLAB/Simulink, COMSOL) and experimental data (NASA, CALCE, and real degradation test benches).
- Publishing high-impact research papers in Q1 SCI journals and presenting at leading international conferences.
- Collaborating with interdisciplinary teams to advance PHM strategies for safe, reliable, and energy-efficient aircraft power systems.

National Transmission & Dispatch Company – Chishtian

City: Chishtian

Lab Assistant (Protection & Instrumentation)

[26/02/2016 – 19/08/2019]

- Responsible for commissioning, testing, and troubleshooting protection systems at 220kV/132kV substations.
- Conducted annual maintenance and calibration of substation protection systems, including energy meters, differential relays, and circuit breakers.
- Performed detailed fault analysis, setting calculations, and relay programming to ensure grid stability and protection coordination.

Ittefaq College of Engineering & Technology – Haroonabad, Pakistan

City: Haroonabad | **Country:** Pakistan

Visiting Instructor in Electrical Technology

[2016 – 2019]

- Delivered courses on electrical engineering principles, energy utilization, transmission, and protection systems.
- Provided hands-on training in power system operation and maintenance, preparing students for careers in the energy and utilities sectors.

Ahmed & Co – Lahore, Pakistan

City: Lahore | **Country:** Pakistan

Electrical Supervisor

[20/02/2015 – 22/02/2016]

- Designed HT and LT panels and diagnosed three-phase motor faults.
- Created power and control drawings for electrical distribution systems, enhancing efficiency and safety in installations.

Multan Electric Power Company – Haroonabad, Pakistan

City: Haroonabad | **Country:** Pakistan

Electrical Trainee

[23/10/2013 – 21/12/2013]

- Assisted in monitoring and maintaining electrical equipment in high-voltage environments.

Northern Power Generation Company Limited – Muzfargrah, Pakistan

City: Muzfargrah | **Country:** Pakistan

Electrical Trainee

[19/09/2012 – 18/10/2012]

- Supported electrical maintenance and fault troubleshooting activities as part of a rotational internship program

LANGUAGE SKILLS

Mother tongue(s): Urdu

Other language(s):

English

LISTENING C1 **READING** C1 **WRITING** C1

SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1

Chinese

LISTENING A1 **READING** A1 **WRITING** A1

SPOKEN PRODUCTION A1 **SPOKEN INTERACTION** A1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

PUBLICATIONS

Selected publications

1. **Saleem, Umar**, W. Liu, S. Riaz, W. Li, and K. Wang, "EnerNet: Attention-based Dilated CNN-BILSTM for State of Health Prediction of CS2 Prismatic Cells in Aerospace Energy Systems," *Electrochimica Acta,* Volume 512, 2025, 145454, ISSN 0013-4686, https://doi.org/10.1016/j.electacta.2024.145454.
2. **Saleem, Umar**.; Liu, W.; Riaz, S.; Li, W.; Hussain, G.A.; Rashid, Z.; Arfeen, Z.A. TransRUL: A Transformer-Based Multihead Attention Model for Enhanced Prediction of Battery Remaining Useful Life. *Energies***2024**, *17*, 3976. https://doi.org/10.3390/en17163976.
3. **Saleem, Umar**, W. Liu, W. Li, M. U. Sardar, M. M. Aslam and S. Riaz, "Enhancing PHM System of Aircraft Generator with Machine Learning-Driven Faults Classification," *2024 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETSIS)*, Manama, Bahrain, 2024, pp. 1-5, **DOI** *10.1109/ICETSIS61505.2024.10459418*.
4. **Saleem, Umar**, Weilin Li, Weinjie Liu, Ibtihaj Ahmad, Muhammad Mobeen Aslam, and Hafiz Umair Lateef. "Investigation of Deep Learning Based Techniques for Prognostic and Health Management of Lithium-Ion Battery." *In 2023 15th International Conference on Electronics, Computers and Artificial Intelligence (ECAI)*, pp. 01-06. IEEE, 2023. **DOI** *10.1109/ECAI58194.2023.10194122*.
5. **Saleem, Umar**, Weilin Li, Qudrat Ullah, Abdul Jabbar, and Muhammad Usman Sardar. "On Improving the Voltage Stability of Three Phase Inverter using DQ Control System." *In 2021 16th International Conference on Emerging Technologies (ICET)*, pp. 1-6. IEEE, 2021, **DOI**10.1109/ICET54505.2021.9689834.
6. **Saleem, Umar**, U.Arshad, B.Masood, T.Gull, W.A.Khan and M. Ellahi. "Faults Detection and Classification of HVDC Transmission Lines of using Discrete Wavelet Transform" *International Conference on Engineering & Emerging Technologies (ICEET)*, Lahore, 22-23 Feb. 2018, pp. 1 – 6, **DOI:** *10.1109/ICEET1.2018.8338615*.
7. Masood, **Saleem, Umar**, N.Anjum and U.Arshad."Faults Detection and Diagnosis of Transmission Lines using Wavelet Transformed based Technique",*IEEE Jordan Conference on Applied Electrical Engineering and Computing Technologies (AEECT)*, 11-13 Oct. 2017, pp. 1 – 6, **DOI**:10.1109/AEECT.2017.8257776.
8. Muhammad Mobeen Aslam, Weilin Li, Wenjie Liu, Yang Qi, **Umar Saleem**, Saleem Riaz. "A review of integrated modeling and simulation of control and communication systems in Smart Grid." *Computers and Electrical Engineering,* vol. 119, part A, 2024, 109553, ISSN 0045-7906, https://doi.org/10.1016/j.compeleceng.2024.109553.
9. Pokharel, Kabindra, Weilin Li, Sonee Sapkota, Yusen Zhang, Hongwei Zhao, and **Saleem, Umar**. "Autonomous transient power management strategy based on improved droop control for DC microgrid." *Electrical Engineering*, 104, no. 6 (2022): 4321-4334. *https://doi.org/10.1007/s00202-022-01602-8*.
10. Sapkota, Sonee, Kabindra Pokharel, Weilin Li, Yufeng Wang, and **Saleem, Umar**. "An improved bidirectional T-source circuit breaker for MVDC." *Electrical Engineering*, 104, no. 4 (2022): 2319-2332. *https://doi.org/10.1007/s00202-021-01473-5*.

HONOURS AND AWARDS

[18/05/2024] Northwestern Polytechnical University

Certificate of Honor

Awarded for active participation in the **1st Belt and Road Academic Forum**, themed *"Innovation, Embracing Diversity: Research Horizons of Tomorrow"*...

[18/12/2024] Northwestern Polytechnical University

Forum Chair Recognition – 2nd Belt and Road Academic Forum

Served as **Parallel Forum I Chair**, contributing to forum organization and technical leadership (Dec 2024)

Springer Journals

Journal Reviewer Recognition

Reviewed manuscripts for:

- *Iranian Journal of Science and Technology: Electrical Engineering* (2025)
- *International Journal of Computational Intelligence Systems* (2025)
- *Electrical Engineering* (2025)
- *Cluster Computing* (2025).

IEEE Conferences and Sections

IEEE Recognitions & Contributions

Reviewer – IEEE URUCON 2024, awarded by IEEE Uruguay Section (Nov 2024)

Reviewer – IEEE ITEC 2020, awarded by IEEE Transportation Electrification Conference and Expo, USA (June 2020)

Oral Presenter – IEEE ICET 2018, awarded by IEEE ICET, Pakistan (Feb 2018)

Oral Presenter – IEEE Forum 2017, awarded by IEEE Jordan Section (Oct 2017)

Participant – IEEE Research Convention, awarded by IEEE Student Branch, The Superior University Lahore (July 2017)

CERTIFICATIONS

Certifications and Memberships

Energy institute UK Membership: Member #0085345

IEEE Membership: Member #93636993

National Technology Council (Pakistan): Professional Engineering Technologist (#PE.Tech/Electrical/00232)

AutoCAD (Electrical): Pakistan Industrial Technical Assistance Center

Electrical Supervisor: Descon Institute of Technical Training

SOFTWARES AND SKILLS

Digital Skills

Simulation Tools: MATLAB, Simulink, PSCAD, ETAP, OPAL-RT, dSPACE, Typhoon HIL.

Programming: Python, C++, TensorFlow, PyTorch, Scikit-learn.

Data Analysis: Pandas, NumPy, Matplotlib; SQL/NoSQL databases.

Control Systems: Expertise in grid-forming and grid-following inverter controls.

HIL Testing: Integration of real-time simulators with hardware.

Version Control: Git for research collaboration.

Documentation: Proficient in LaTeX, Word, Overleaf.

Electrical Laboratory Skills: Testing and commissioning of relays, fault diagnostics, protection systems, and HV/LV equipment.

RECOMMENDATIONS

Name: **Dr. Liu Wenjie** | Assistant Professor, School of Automation, Northwestern Polytechnical University, China

1. I have known Umar Saleem during his Ph.D. studies at Northwestern Polytechnical University, Xi'an, China, where I had the privilege of co-supervising him.
2. He is wonderful in publishing innovative research, particularly in AI-driven models for condition and health monitoring, RUL estimation, fault-tolerant energy system control, photovoltaic performance evaluation, and smart microgrid design under challenging conditions.
3. I strongly recommend Umar Saleem for a postdoctoral position, particularly in Electrical Engineering fields such as AI-driven methods for condition and health monitoring power systems, renewable energy, and smart grid control technologies.

Email: wenjieliu@nwpu.edu.cn | **Phone number:** (+86) 18792411659

Name: Engr. Dr. Bilal Masood | Additional Director of NEPRA (National Electric Power Regulatory Authority)

1. I have known Umar Saleem during his Master's degree at Superior University Lahore, where I had the privilege of supervising him.
2. He is wonderful in publishing innovative research in power system protection, MATLAB simulations, wavelet transforms, and fault analysis.
3. I strongly recommend Umar Saleem for any role in Electrical Engineering, particularly in AI applications in power systems, renewable energy, and smart grid technologies.

Email: drbilalmasood@nepra.org.pk | **Phone number:** (+92) 3000264248