

● WORK EXPERIENCE

15/03/2024 – CURRENT Rome, Italy

UNIVERSITY TEACHING ASSISTANT SAPIENZA UNIVERSITY OF ROME

- Conducting Classes of the course Renewables
- Engaging Master students in Lab activities
- Help students for their Master's thesis

01/08/2023 – 16/12/2023 Nottingham, United Kingdom

RESEARCH ASSOCIATE POWER ELECTRONICS AND MACHINE CENTER, UNIVERSITY OF NOTTINGHAM

- Analyzed and Implemented model free control using Ultra-local model for the DC-DC converter to control the output voltage and inductor current.
- Developed algorithm for sliding mode observer based sensor disturbance rejection.
- Developed a new technique to diagnose Open circuit fault diagnosis of Interleaved Boost Converter.
- Proposed a novel fault diagnosis method for 2-L Inverter in SynRM.

31/01/2022 – 31/07/2022 Roma, Italy

UNIVERSITY TEACHING ASSISTANT SAPIENZA UNIVERSITY OF ROME

- Conducting Classes of the course Renewables
- Engaging Master students in Lab activities
- Help students for their Master's thesis

05/10/2018 – 10/10/2019 Nowshera, Pakistan

UNIVERSITY RESEARCH ASSISTANT ELECTRICAL AND ELECTRONICS DEPARTMENT, UNIVERSITY OF TECHNOLOGY

- Development in Power System and Power Electronics Domain
- Conduction of laboratories session
- Content writing of research papers

03/07/2018 – 28/07/2019 Peshawar, Pakistan

PROJECT ENGINEER U.S. PAKISTAN CENTER FOR ADVANCED STUDIES IN ENERGY, UNIVERSITY OF ENGINEERING AND TECHNOLOGY

- Project Design and Development
- Quality Assurance
- Report Writing

03/05/2017 – 26/06/2018 Peshawar, Pakistan

EDUCATIONAL RESEARCHER U.S. PAKISTAN CENTER FOR ADVANCED STUDIES IN ENERGY, UNIVERSITY OF ENGINEERING AND TECHNOLOGY

- PCB designing in Proteus and milling it with CNC machine
- Troubleshooting the finished board.

- Documentation of new projects i.e., proposals, monthly reports
- Purchasing and Managing of Semiconductor Devices

20/08/2017 – 09/12/2017 Tempe, United States

EXCHANGE RESEARCH SCHOLAR ENGINEER ARIZONA STATE UNIVERSITY, UNITED STATES

- Modeling of Multi-Level Inverter in PSCAD
- Developed transmission line model and apply different faults to observe the effect of footing resistance to back flash over-voltage
- Conducted research on digital relays

● EDUCATION AND TRAINING

01/11/2020 – CURRENT

DOCTOR OF PHILOSOPHY (FELLOWSHIP) IN ENGINEERING AND APPLIED SCIENCE FOR ENERGY AND INDUSTRY Sapienza University of Rome

Address Rome, Italy

18/09/2016 – 09/12/2018 Peshawar, Pakistan

MASTER OF SCIENCE IN ELECTRICAL ENERGY SYSTEM ENGINEERING US Pakistan Center for Advanced Studies in Energy, University of Engineering and Technology

CGPA: 3.57 / 4.00 **Thesis Title:** Modeling, Design and Control of Multi Level Inverter Having Low Total Harmonic Distortion **Short Description:** Designing and Modeling of Multi-Level Inverter by using Bio-inspired Artificial Intelligent Algorithms to decrease the total harmonic distortion and to increase the power quality. **Supervisor:** Dr Abdul Basit

12/08/2017 – 09/12/2017 Phoenix, United States

ENERGY RESEARCH TRAINING PROGRAM Arizona State University, Tempe Campus

23/09/2012 – 10/08/2016 Peshawar, Pakistan

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING University of Engineering & Technology

CGPA: 3.32 / 4.00

Final Year Project: Head Movement Based Robotic Vehicle

Short Description: Designing and implementation of a head movement based robotic vehicle for those having physical disabilities and cannot even control the automatic wheel chair, but can only move their heads.

Supervisor: Engr Mujtaba Hassan

● PUBLICATIONS

Journals

1. Dardouri, M., **M. Salman**, S. Khojet El Khil, C. Boccaletti, and K. Jelassi. "A Multiple-Sensor Fault-Tolerant Control of a Single-Phase Pulse-Width Modulated Rectifier Based on MRAS and GPI Observers." *Electronics* 13, no. 3 (2024): 502. <https://doi.org/10.3390/electronics13030502>
2. Sami, Irfan, Shafaat Ullah, Shafqat Ullah, Syed Sabir Hussain Bukhari, Naseer Ahmed, **Muhammad Salman**, and Jong-Suk Ro. "A Non-Integer High-Order Sliding Mode Control of Induction Motor with Machine Learning-Based Speed Observer." *Machines* 11, no. 6 (2023): 584. <https://doi.org/10.3390/machines11060584>
3. **Muhammad Salman**, Inzamam Ul Haq, Tanvir Ahmad, Haider Ali, Affaq Qamar, Abdul Rauf and Abdul Basit, "Minimization of Total Harmonic Distortions of Cascaded H-Bridge Multi-level Inverter by Utilizing Bio-Inspired AI Algorithm", *EURASIP Journal on Wireless Communication and Networking*, 66 (2020); <https://doi.org/10.1186/s13638-020-01686-5>
4. **Muhammad Salman**, Abdul Basit, Aemal Ahmad, Zeeshan Saeed Shah, Kamran Alam, "Modeling of Cascaded H-Bridge Multi-level Inverter Having Low Total Harmonic Distortion by using Equal Phase Distribution Method", *International Journal of Engineering Works*, Vol. 6, Issue 03, PP. 84-89, March 2019.
5. Kamran Alam, Saddam Ali, Abdul Saboor, **Muhammad Salman**, Maoz, Muhammad Humayun, Muhammad Sadiq and Muhammad Arif, "Antireflection, Superhydrophilic Nano-Porous SiO Coating

based on Aerosol Impact Spray Deposition Technique for Solar PV Module", Coatings 2019, 9(8), 497; <https://doi.org/10.3390/coatings9080497>

6. Rizwan kamal, Muhammad younas, Shakeel ahmed and **Muhammad Salman**, "Homer based Techno-Economic Comparison of Solar PV, Micro Hydro and Biomass Renewable Energy System with and without Battery Storage", International Journal of Engineering Works, Vol. 5, Issue 10, PP. 203-210, October 2018.
7. Usman Rahat, Abdul Basit and **Muhammad Salman**, "Voltage control for DC-DC converters", International Journal of Engineering Works, Vol. 5, Issue 10, PP. 198-202, October 2018. <https://doi.org/10.20944/preprints201808.0288.v1>

Conference Proceedings

1. **Salman, M.**, Zanchetta, P., El Khil, S., Boccaletti, C., "Open Switch Fault Diagnosis and Localization for Voltage Source Inverters in Synchronous Reluctance Motor Drives" 26th International Conference on Electrical Machines (ICEM 2024), 1-4 September 2024, Torino, Italy. (Accepted)
2. Moayed Almobaied, Hassan S. Al-Nahhal, **Muhammad Salman**, Chiara Boccaletti, "Design of an Efficient Energy Harvesting System for Smart Grid Connection Based on Piezoelectric Technology", 5th International Conference on DC Microgrids (ICDCM 2023), 5-17 November 2023, Auckland, New Zealand.
3. **Muhammad Salman**, Najeeb ullah, Mohammad Zia Javed, Chiara Boccaletti, "Model of 9 level transformerless RV topology Grid-tied inverter for PV applications", 48th Annual Conference of the Industrial Electronic Society, October 17-20, 2022, Brussels, Belgium. [10.1109/IECON49645.2022.9969088](https://doi.org/10.1109/IECON49645.2022.9969088)
4. **Muhammad Salman**, Merium Dardouri, Sejir Khojet El Khil, Chiara Boccaletti, "Open Switch Fault Diagnosis and Current Sensor Tolerant Control of a DC-DC Interleaved Boost Converter using Generalized Proportional Integral Observer, 13th Edition of the IEEE International Symposium on Diagnostics for Electric Machines, Power Electronics and Drives, August 20-25, 2021, Dallas TX, USA. [10.1109/SDEMPED51010.2021.9605525](https://doi.org/10.1109/SDEMPED51010.2021.9605525)
5. **Muhammad Salman**, Abdul Basit, Muhammad Shoaib Khalid, Affaq Qamar, "Reduction in Total Harmonic Distortion of Cascaded H-Bridge Multilevel Inverter with Equal Phase Method", The 16th IEEE Clemson University Power System Conference on Smart Grid Technologies and Innovation, September 4-7, 2018, Charleston, South California, USA. [10.1109/PSC.2018.8664070](https://doi.org/10.1109/PSC.2018.8664070)

● CONFERENCES AND SEMINARS

16/05/2022 Sapienza University of Rome

AAT transformers isolated with natural esters: operational experiences

11/04/2022 Sapienza University of Rome

Management Seminar of the National Electricity System

08/04/2022 Sapienza University of Rome

Renewable Energy Communities: integration of distributed generation with the electricity grid

08/03/2022 – 09/03/2022 Sapienza University of Rome

Optimal Operation and Planning of Energy Hub in GAMS

15/12/2021 Sapienza University of Rome

Approaches to address and ensure resilience of future net-zero power systems

26/10/2021 Sapienza University of Rome

Low-cost rural electrification with Iliceto Shield Wire Scheme for Micro-Grids and RES Advancement in Developing Countries

● NETWORKS AND MEMBERSHIPS

IEEE Institute of Electrical and Electronics Engineers

IAS Industrial Application Society

● PROJECTS

12/09/2023 – 16/12/2023

Mobilit Grant for the Project Entitled, "Performance evaluation of Model Predictive Control applied to synchronous reluctance motor drives under converter and machines faulty conditions" University of Nottingham

01/09/2022 – 30/10/2023

Won Project Entitled, "Open Switch Fault Diagnosis and Current Sensor Fault Tolerant Control of a DC-DC Interleaved Boost Converter using Generalized Proportional Integral Observer" as Principal Investigator (PI)-Sapienza University of Rome

● HONOURS AND AWARDS

Honours and awards

- Awarded Mobility grant to University of Nottingham, UK by Sapienza University of Rome
- Awarded PhD fellowship grant for three years by Sapienza University of Rome
- Awarded a grant for the research project entitled "Open Switch Fault Diagnosis and Current Sensor Fault Tolerant Control of a DC- DC Interleaved Boost Converter using different Control Strategies" by Sapienza University of Rome.
- Awarded a grant as a student tutor for the course of Renewables in Sapienza University of Rome.
- Awarded Laptop from Prime Minister Foundation
- Sponsored by USAID for research training at Arizona State University
- Awarded by USAID scholarship for graduate studies
- Final year project funded by National Grassroot ICT R&D fund
- HEC (Higher Education Commision) need and merit based scholarship for undergraduate studies

● LANGUAGE SKILLS

Mother tongue(s): **PASHTO**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	C1	C1	B2
ITALIAN	B1	B1	A2	A2	B1

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

● PRESENTATIONS

Posters

- Design, Modeling And Control Of Modular Multi-Level Inverter by Using Bio- Inspired Artificial Intelligent Algorithm Having Low Total Harmonic Distortion "International Conference on Sustainable Energy Pakistan", USPCAS-E 2019.
- Reduction in total harmonic distortion of cascaded H-Bridge Multilevel inverter with different Switching angle arrangement techniques, "National Conference on Green Energy Technologies", USPCAS-E 2018.

Paper Presentations

- Design of an Effiient Energy Harvesting System for Smart Grid Connection Based on Piezoelectric Technology", 5th International Conference on DC Microgrids (ICDCM 2023), 5-17 November 2023, Auckland, New Zealand.
- Model of 9 level transformerless RV topology Grid-tied inverter for PV applications", 48th Annual Conference of the Industrial Electronic Society, October 17-20, 2022, Brussels, Belgium.
- Open Switch Fault Diagnosis and Current Sensor Tolerant Control of a DC-DC Interleaved Boost Converter using Generalized Proportional Integral Observer, 13th Edition of the IEEE International

Symposium on Diagnostics for Electric Machines, Power Electronics and Drives, August 20-25, 2021, Dallas TX, USA.

- Reduction in Total Harmonic Distortion of Cascaded H-Bridge Multilevel Inverter with Equal Phase Method", The 16th IEEE Clemson University Power System Conference on Smart Grid Technologies and Innovation, September 4-7, 2018, Charleston, South Carolina, USA.

● **CERTIFICATIONS**

09/11/2017

Teaching Volunteer Arizona State University, United States

Participated as a teaching volunteer for ASU course SOS 322 on International Development and Sustainability in the role of country expert. I helped students to work on preparing a Human Development Report in the context of a class assignment.

10/08/2017 – 10/12/2017

Research Training Arizona State University, United States

Completed research training in Power System Lab under the supervision of Prof. George Karady. The research training includes the study about smart grid, power world, PSCAD (power system computer aided design), Mathcad, digital relays and different protection schemes.

● **SUMMER SCHOOL**

22/05/2023 – 26/05/2023

Power Electronics, Electrical Machines, Energy Control and Power Systems

● **REVIEWER**

SEST22 (Smart Energy and System Technology)

IECON22 (Conference of the Industrial Electronic Society)

ICEM22 (International Conference on Electrical Machines)
