

CURRICULUM VITAE
OF
Muhammad S. ABU-KHAIZARAN
Associate Professor
Electrical and Computer Engineering Department
Birzeit University, Birzeit, P.O. Box 14, Palestine
Phone: 00970 (or 00972) 2298 2935
Email: mkhaizaran@birzeit.edu
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Personal Data

- **Citizenship:** Palestinian
- **Date and place of birth:** 7th May 1971, Tubas-Palestine
- **Marital Status:** Married with three children

Speciality: Power Electronics, Renewable Energies and Electrical Machine Drives

Education

Oct.1999 - July 2003 PhD in Power Electronics from the **University of Cambridge, UK**

The PhD is titled “The Design of a High Power IGBT Based Current Source Inverter Drive”. It is focused on the implementation of IGBTs in High Power Current Source Inverters. The research included Orcad/PSpice-modelling, stability analysis of the inverter and gate-drives of IGBTs implementing either hard drive or Active Voltage control techniques. Also, simulation was conducted for the gate drives and the High power DC/AC inverters; Current and Voltage Source Inverters. The PhD also included experimental verification of the analytical and simulation results on a prototype rig.

Oct.1998 - Sep.1999 MPhil in Power Electronics from the **University of Cambridge, UK**

The MPhil was titled “The Design of a High Power IGBT based Current Source Inverter Drive”. The work examined the current source inverters and the switching of IGBTs applying hard drive and active voltage control. The study included programming micro-controllers to generate the control signals for the IGBTs implementing Space Vector Modulation switching scheme.

Oct.1990 - Jan.1996 First class honour degree (BSc) in Electrical Engineering from **Birzeit University, Palestine**

The fifth year project was titled "Solid State Control of Single Phase Induction Motor". It was based on applying a two-TRIAC method for controlling a single-phase induction motor; starting, reversing and controlling its speed. The project included hardware design and computer modelling of the system using PASCAL language.

Fields of Interest

- Renewable Energy Integration in Electrical Power Systems
- Power Electronic Inverters Implementation in Micro Grid Power Systems
- Gate Drives for IGBTs
- Series Connection of IGBTs in high power switches.
- Machine Drives and VVVF Drives
- Power Factor Correction Via Power Electronics
- Energy Efficient DC Power supplies

Software skills

An extensive knowledge in: PSpice/Orcad, Matlab/Simulink, MPLab, Pascal, PowerWorld Simulator, AutoCad, Fortran, and Assembly language, MS Office ...

Work Experience and Activities

- Currently working as an Associate Professor in the Electrical and Computer Engineering Department -Birzeit University since August 2017. My duties are, but not restricted to: teaching and developing undergraduate courses, demonstrating Labs, supervising Graduation projects and Master theses, conducting research in up-to-date topics of power engineering, developing the curriculum for Electrical Engineering programme, participating in developing new programmes in the Department, tutoring Electrical Engineering students, preparing proposals for upgrading Labs, and participating in technical committees of the Department, Faculty of Technology and Engineering, and University.
- Participated and presented a paper entitled "Predicting Photovoltaic Energy Profile of Birzeit University Campus Based on Weather Forecast", in ICRPGTA 2020: XIV,

International Conference on Renewable Power-to-Gas Technologies and Applications Conference held in Amsterdam, The Netherlands, in Aug., 2020.

- Participated and presented a paper entitled, “An Earth Fault Current Limiter Using a Modular Multilevel Inverter for Smart Grids Operation”, in 2020 IEEE International Conference on Environment and Electrical Engineering and 2020 IEEE Industrial and Commercial Power Systems Europe (20EEEIC/4I&CPS Europe), held in Madrid-Spain, in June 2020.
- A Visiting Academic Fellow at the University of Cambridge-UK for one academic year (September 2018 to August 2019), researching Modelling of GaN devices and their implementation in Renewable Energy systems. The visit was funded by Arab Fund Fellow Scholarship Programme.
- Director of the Master in Electrical Engineering programme (September 2016 –August 2018), my duties involved management of the newly developed Master programme in terms of courses delivery, tutoring graduate students, admission of new students, revising the curriculum, ...
- Attended and presented two papers in the 2018 IEEE International Conference on Environment and Electrical Engineering (EEEIC) held in Palermo-Italy during the period 12-15 June 2018. The first paper was entitled “Photovoltaic Array Modelling and Boost-Converter Controller-Design for a 6kW Grid-Connected Photovoltaic System - DC Stage”, published in EEEIC18 CD pp. 2481-2486. The second paper was entitled “Design and Modelling of a 6kW Grid-Connected Photovoltaic System – AC Stage”, published in EEEIC18 CD pp. 2456-2462.
- Worked as an Assistant Professor in the Electrical and Computer Engineering Department -Birzeit University from September 2003 to July 2017. My duties were, but not restricted to: teaching and developing undergraduate courses, demonstrating Labs, supervising Graduation projects and Master theses, conducting research in up-to-date topics of power engineering, developing the curriculum for Electrical Engineering programme, participating in developing new programmes in the Department, tutoring Electrical Engineering students, preparing proposals for upgrading Labs, and participating in technical committees of the Department, Faculty of Technology and Engineering, and University.

- A Visiting Scholar at the University of Ruse-Bulgaria for one week in July 2017, to conduct staff training. The visit was funded by Erasmus + Staff Mobility Programme.
- During various years, I was a member of many committees within the Electrical and Computer Engineering Department, Faculty of Engineering and Technology, and the University such as Cadere (recruiting) committee, Upgrading Power Labs committee, Seminars committee, Green Campus committee, Developing Master Programme committee, Tenders committee,...
- Organizing various workshops to disseminate the newly developed Electrical Engineering Master programme during the years 2014 and 2015
- A coordinator for designing, developing and establishing a new Joint Master programme in Electrical Engineering at Birzeit University and Palestine Polytechnic University, in collaboration with other Palestinian and European Universities (December 2013 to November 2017). The programme is established via a project funded by EU Tempus.
- A Supervisor and examiner of Master theses and fifth year Graduation projects including their research, reports and practical implementation of projects
- A Visiting Scholar at the Technical University of Dresden-Germany for 10 weeks in summer 2015, researching DC converters for battery optimization implemented using Thin Film Technologies. The visit was funded by DAAD Scholarship.
- An Internal examiner of a Master's Thesis entitled 'Loss Capitalization and Optimum Transformer Design-Case Study Jerusalem District Electricity Company JDECo' by Sari Ibrahim submitted to Birzeit University in February 2014
- Attending, as a representative of the South Mediterranean partners of the selected 'Joint Master in Electrical Engineering Proposal' in Tempus IV sixth Call, an International Conference organised in the framework of the EU Tempus Programme, and organized by the "Educational, Audiovisual and Culture Executive Agency" in Brussels Belgium, February 2014
- A reviewer of many papers submitted (published or rejected) to IEEE Transactions on Power Electronics or Industry Applications Journals
- A Visiting Scholar at Department of Astronautical, Electrical and Energetic Engineering, Sapienza University of Rome, Italy for two months during summer 2013, researching power losses and improving efficiency in power electronic converters for renewable energy systems. The visit was funded by Erasmus Mundus Avempace II Scholarship.

- Designer and Developer of the teaching materials for a new course for undergraduates: “Electrical Installations and Drawings”, which is composed of two parts; Theoretical Lectures and Laboratory Experiments. The course deals with Designing and Planning Domestic and Industrial Electrical Installations, whilst the practical aspect involves designing, drawing and implementing the Electrical Installations in Laboratory.
- Designing new experiments and developing many labs such as Simulation laboratory, Electrical Machines laboratory, Control and Power Electronics Laboratory. Also preparing the experimental manuals for the aforementioned Labs
- A Chairman of the Electrical Engineering Department - Birzeit University, Palestine, during the period from September 2008 to August 2011. My duties were, but not limited to: overall management of the Department, planning courses delivery, preparing proposals for upgrading the department and its Labs, recruiting new staff and academics. Participating in the Faculty of Engineering council, and participating in setting up policies and strategic planning for the Faculty and Department
- A consultant for the Electrical works of “Lighting Wadi Al-Nnar by Solar Energy” Project 2011. The project is about designing, installing and testing Photovoltaic Panels to electrify 98 street lamps
- Attended a one-week training-course on equipment for Electrical Machines and Machine Drives Laboratories, by Leybold Didactic, Cologne, Germany, January 2011
- The Head of Master’s Programme Committee, which is responsible for developing a proposal for Establishing a Master Programme in Electrical Engineering at Birzeit University during the academic years 2009/2010 and 2010/2011
- A reviewer of many papers submitted to the 9th International Conference on Power Electronics and Drive Systems IEEE-PEDS 2011 held in Singapore, 5-8 December 2011
- A reviewer for “Programmable Logic Controllers, an Introduction” book by W. Bolton, 3rd edition, Newnes, 2008
- Consultant for the Electrical System design in Rawabi (a newly developed and established Palestinian city) Palestine, 2008
- A committee member of the Scientific Computing Master Program 2007/2008
- Attended and presented a paper in the IEEE Power Electronics Specialist Conference (PESC’08) held in the Island of Rhodes, Greece during the period 15-19 June 2008. The

paper was titled: Parameters Influencing the Performance of an IGBT Gate Drive. Published in Proc. IEEE PESC'08, CD pp.3457-3462

- A member of the Steering committee for preparing and approving a Palestinian National Electric Code in collaboration with the Palestinian Standard Institution since May 2008
- Participating in a workshop titled: Sources of Electrical Energy in Palestine, Evaluation of Alternatives (Renewable Energy Sources) held in Ramallah 13th August 2007. The workshop was organised by the Development of the Private Sector Centre
- Attended and presented a paper in the IEEE Power Electronics Specialist Conference (PESC'07) held in Orlando, Florida, USA during the period 17-21 June 2007. The paper was titled: Commutation in a High Power IGBT based Current Source Inverter. Published in Proc. IEEE PESC'07, CD pp. 2209-2215
- A Head of the Committee for preparing a manual for the Engineering Simulation Lab taught by the Electrical Engineering Department, Fall 2006/2007
- Attended and participated in a workshop about Strategic Planning for the Engineering Department/Birzeit University held in Jericho/Palestine during the period 26-28 December 2006 in cooperation with the Centre of Continuing Education- Birzeit University
- A Chairman-Assistant of the Electrical and Computer Systems Engineering Department -Birzeit University in the period: February 2005 – September 2006,
- An External examiner of a Master's Thesis entitled 'Optimal Vector Control of Three Phase Induction Machine' by Jasem Tamimi submitted to Alquds University, December 2005
- An Internal examiner of a Master's Thesis titled 'Fuzzy Logic Control of Induction Motor' by Jaafar Al Titi submitted to Birzeit University in December 2004
- A Consultant for the Electrical System in the Palestinian Tower (25 storey building)- Ramallah, 2005
- Attended a workshop about 'Field Programmable Gate Arrays' held at Birzeit University in cooperation with French government, Fall 2005
- A Coordinator of 'The Second Engineering Work Conference in Palestine' held at Birzeit University in the period 19-22 September 2005. The conference was held in collaboration between the Engineering Association and the Engineering Faculty at Birzeit University

- Attended a workshop about 'Programmable Logic Controllers' held at Birzeit University in cooperation with French government, Fall 2004
- A Visiting Scholar at the Engineering Department University of Cambridge, Cambridge UK, summer 2004. The research was concentrated on designing and experimenting Active Voltage Controllers for series IGBTs
- Attended a one year course (one lecture per week) in 'Basics of Building a Business'. The course was held during the academic year 2002/2003 in the Entrepreneurship Centre-University of Cambridge-UK
- Worked as a part-time Research Associate in the Department of Engineering, Cambridge University, from September 2001 to September 2003
- Worked as a Tutor in the Department of Engineering, University of Cambridge (1999-2003) for various courses: Power Electronics, Machine Drives and Power Systems (3rd year), Switch-Mode Electronics (3rd year), Electric Drive Systems (3rd year), Linear Circuits and Devices (1st year), Electrical Power and Machines (2nd year) and Electromagnetism (1st year)
- A Designer and a developer of single-phase voltage source inverters, which are currently running in London underground trains. The development was carried out during the academic year 1999/2000 in collaboration with Powertron Ltd., Cambridge, UK
- Attended and presented a paper in the Power Electronics Specialist Conference (PESC'01) held in Vancouver, British Columbia, Canada, June 2001. The paper was titled: The Series Connection of IGBTs in a Current Source Inverter. Published in Proc. IEEE PESC'2001, Vol. 1, pp. 170-175
- Attended a workshop about 'Economic Sustainable Development' held at Al-Najah University in cooperation with the German Government during the period: 8-13/11/1997
- Worked as an Electrical Engineer in Tubas Municipality, Palestine, from June 1996 to October 1998. During that period, I managed the resources of the Electricity Department, which had a power plant of 3 MW. I was involved in designing and installing low and medium voltage distribution networks. Also, I was involved in a project for designing and installing a medium voltage network connecting the grid of 20 villages together, and of a power rating of 20MW.

Teaching Experience

Instructor for the following courses

- JMEE7313: Advanced Motor Drives and Applications (a Master's course)
- JMEE6306: Power Electronic Converters and Applications (a Master's course)
- ENEE5303: Electrical Machine Drives and Special Purpose Motors
- ENEE5306: Protection and Automation of Power Systems
- ENEE3305: Power Electronics
- ENEE4301: Electrical Machines and Power Electronics
- ENEE2408: Electrical Machines
- ENEE4202: Electrical Installations and Drawings
- ENEE2301: Network Analysis I
- ENEE234: Electric Circuits
- ENEE231: Introduction to Electrical Engineering

Supervisor for

- JMEE860 and MCOM860: Master Theses
- ENEE5200: Introduction to Graduation Projects
- ENEE5300: Graduation Projects

Instructor and Demonstrator for the following laboratories

- ENEE5102: Advanced Power Lab
- ENEE4105: Control and Power Electronics Lab
- ENEE3101: Electrical Machines Lab
- ENEE4101: Electrical Machines and Power Electronics Lab
- ENEE4104: Electrical Installations and Drawings Lab
- ENEE2102: Electrical Circuits Lab
- ENEE2101: Introduction to Electrical Engineering Lab

Tutor for (University of Cambridge-UK during 1999 to 2003) for: Power Electronics, Machine Drives and Power Systems (3rd year), Switch-Mode Electronics (3rd year), Electric Drive Systems (3rd year), Linear Circuits and Devices (1st year), Electrical Power and Machines (2nd year) and Electromagnetism (1st year) courses.

Scholarships and Prizes

- Awarded the "Best Presentation Award" by the Program Committee as per the Awards Scheme of the "International Conference on Renewable Power-to-Gas Technologies and Applications Conference", Amsterdam, The Netherlands, Aug., 2020.
- Awarded **Arab Fund Fellowship Programme Scholarship** for one year starting from 1st September 2018 to conduct research at the University of Cambridge UK.
- Awarded the **Most Popular Instructor Award** for Electrical Engineering Programme, Birzeit University, Palestine, May, 2018
- Awarded **Erasmus+ Staff Mobility Scholarship** for one week in July 2017 to conduct training at the University Of Ruse-Bulgaria
- Awarded **DAAD Short Visit Scholarship** for 10 weeks in summer 2015 to conduct research at the Technical University of Dresden-Germany
- Awarded the **Most Popular Instructor Award** for Electrical Engineering Programme, Birzeit University, Palestine, April, 2015
- Awarded **Erasmus Mundus Avempace II Staff Exchange Scholarship** for three months to conduct research, during Summer 2013, at Sapienza University of Rome, Italy
- Awarded a **Cambridge Overseas Trust Scholarship** (1999-2001) to study towards the PhD degree
- Awarded an **Arab-British Chamber Charitable Foundation Scholarship** to study for the MPhil degree at the University of Cambridge (1998-1999)
- Awarded the **Academic Excellence Student Prize** for the years 1994-1995 and 1995-1996 from the Faculty Board of the Engineering Department, Birzeit University

Memberships and Fellowships

- Fellow of the Cambridge Commonwealth Society, Cambridge, UK
- Fellow of the Philosophical Society, Cambridge, UK 2000-2003
- Member of Hughes Hall College/Cambridge, UK
- Member of the Palestinian Engineers Association, Palestine

Publications

1. Mahran Quraan, Muhammad Abu-Khaizaran, Jaser Sa'ed, Wael Hashlamoun, and Pietro Tricoli, "Design and control of battery charger for electric vehicles using modular multilevel converters", *IET Power Electronics*. 2020; 1– 18. <https://doi.org/10.1049/pel2.12018>.
2. Muhammad Abu-Khaizaran, Ahmad Faza', Tariq Othman, and Yahia Yousef, "Predicting Photovoltaic Energy Profile of Birzeit University Campus Based on Weather Forecast", *ICRPGTA 2020: XIV, International Conference on Renewable Power-to-Gas Technologies and Applications Conference Proceedings, Part II*, pp. 206-212, Amsterdam, The Netherlands, Aug., 2020.
3. B. Abojams, M. Quraan and M. Abu-Khaizaran, "A Multi-Function Current Controller for a Virtual Synchronous Generator," 2020 International Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM), pp. 652-656, doi: 10.1109/SPEEDAM48782.2020.9161969, Sorrento, Italy, June, 2020.
4. M. Abu-Khaizaran, Anas Masalmeh, Rukan Amireh, Islam Saleh, and Mahran Quraan, "An Earth Fault Current Limiter Using a Modular Multilevel Inverter for Smart Grids Operation", 2020 IEEE International Conference on Environment and Electrical Engineering and 2020 IEEE Industrial and Commercial Power Systems Europe (20EEEIC/4I&CPS Europe), pp. 1004-1009, doi: 10.1109/EEEIC/ICPSEurope49358.2020.9160697, Madrid-Spain, June 2020.
5. N. Motan, M. Abu-Khaizaran, and M. Quraan, "Photovoltaic Array Modelling and Boost-Converter Controller-Design for a 6kW Grid-Connected Photovoltaic System - DC Stage", 2018 IEEE International Conference on Environment and Electrical Engineering and 2018 IEEE Industrial and Commercial Power Systems Europe (18EEEIC/2I&CPS Europe), pp. 2481-2486. Palermo-Italy, June 2018.
6. N. Motan, M. Abu-Khaizaran, and J. Sa'ed, "Design and Modelling of a 6kW Grid-Connected Photovoltaic System – AC Stage", 2018 IEEE International Conference on Environment and Electrical Engineering and 2018 IEEE Industrial and Commercial Power Systems Europe (18EEEIC / 2I&CPS Europe), pp. 2456-2462. Palermo-Italy, June 2018.
7. J. A. Sa'ed, M. Quraan, M. Abu-Khaizaran, S. Favuzza and F. Massaro, "Control of Solid-State Fault Current Limiter for DG-Integrated Distribution Systems," 2017 IEEE International Conference on Environment and Electrical Engineering and 2017 IEEE

- Industrial and Commercial Power Systems Europe (17EEEIC / I&CPS Europe), pp. 1-5.
DOI: 10.1109/EEEIC.2017.7977785, Milan, Italy, June 2017.
- 8.** S. A. Saleh, A. S. Aljankawey, M. S. Abu-Khaizaran, and B. Alsayid, "Fault Impacts on Power Electronic Converters in DGUs-Part I: Wind Energy Conversion Systems", published in IEEE Transactions on Industry Applications, VOL. 51, Issue 4, pp. 2819 - 2831, July/Aug 2015.
 - 9.** S. A. Saleh, A. S. Aljankawey, B. Alsayid, and M. S. Abu-Khaizaran, "Influences of Power Electronic Converters on Current-Voltage Behaviours During Faults in DGUs-Part II: Photovoltaic Systems", published in IEEE Transactions on Industry Applications, VOL. 51, Issue 4, pp. 2832 - 2845, July/Aug 2015.
 - 10.** S. A. Saleh, A. S. Aljankawey, M. S. Abu-Khaizaran, and B. Alsayid, "Fault Impacts on Power Electronic Converters in DGUs-Part I: Wind Energy Conversion Systems", published in IEEE IAS Conference proceedings, DOI: 10.1109/IAS.2014.6978504, Vancouver, BC, Canada, October 2014.
 - 11.** S. A. Saleh, A. S. Aljankawey, B. Alsayid, and M. S. Abu-Khaizaran, "Influences of Power Electronic Converters on Current-Voltage Behaviours During Faults in DGUs-Part II: Photovoltaic Systems", published in IEEE IAS Conference proceedings, DOI: 10.1109/IAS.2014.6978505, Vancouver, BC, Canada, October 2014.
 - 12.** S. A. Saleh, R. Ahshan, M.S. Abu-Khaizaran, B. Alsayed, and M.A. Rahman, "Implementing and Testing d-q WPT-Based Digital Protection for Micro-Grid Systems", IEEE Transactions on Industry Applications, VOL. 50, NO. 3, pp. 2173 - 2185, May/June 2014.
 - 13.** S. A. Saleh, R. Ahshan, M.A. Rahman, M.S. Abu-Khaizaran, B. Alsayed, "Implementing and Testing d-q WPT-Based Digital Protection for Micro-Grid Systems", IEEE Industry Applications Society Annual Meeting, pp. 935 - 942 Orlando, USA 2011.
 - 14.** Yalan Wang, Patrick R. Palmer, Angus T. Bryant, Stephen J. Finney, Muhammad S. Abu-Khaizaran, Gangru Li, "An Analysis of High-Power IGBT Switching under Cascade Active Voltage Control", in IEEE Transactions on Industry Applications, Vol. 45, No. 2, pp. 861-870, March/April 2009.
 - 15.** Muhammad Abu-Khaizaran, Patrick Palmer and Yalan Wang, "Parameters Influencing the Performance of an IGBT Gate Drive" in Proc. IEEE PESC'08, CD pp.3457-3462, Island of Rhodes, Greece, 15-19 June 2008.

- 16.** Muhammad Abu-Khaizaran and Patrick Palmer, "Commutation in a High Power IGBT Based Current Source Inverter" in Proc. IEEE PESC'07, CD pp. 2209-2215, Orlando, Florida, USA, 17-21 June 2007.
- 17.** Wang, Y.; Bryant, A.T.; Palmer, P.R.; Finney, S.J.; Abu-Khaizaran, M.; Li, G. "An Analysis of High Power IGBT Switching under Cascade Active Voltage Control" in Proc. IEEE IAS'05, Vol. 2, pp. 806- 812, Kowloon, Hong Kong, October 2005.
- 18.** PR Palmer, Y Wang, M Abu-Khaizaran and S. Finney, "Design of the Active Voltage Controller for Series IGBTs", in PESC2004, CD pp. 3248-3254, Aachen, Germany, 20-25 June 2004.
- 19.** Yalan Wang, Muhammad S. Abu Khaizaran and Patrick R. Palmer, "Controlled Switching of High Voltage IGBTs in Series", in Proc. IEEE Conference on Electron Devices and Solid State Circuits, pp. 297-300, Hong Kong, 16-18 December 2003.
- 20.** M.S. Abu-Khaizaran, H.S. Rajamani and P.R. Palmer, "The High Power IGBT Current Source Inverter," in Proc. IEEE IAS'01, Vol. 2, pp. 879-885, Chicago, Sept./Oct. 2001.
- 21.** P.R. Palmer and M.S. Abu-Khaizaran, "The Series Connection of IGBTs in a Current Source Inverter," in Proc. IEEE PESC'2001, Vol. 1, pp. 170-175, Vancouver, June 2001.

Referees are available upon request