

Dr. Sahban Alnaser
Associate Professor of Electrical Power Systems & Smart Grids
The University of Jordan

I have more than 18 years of industrial and academic experience in the electrical power and energy sector. My experience focuses on planning, operation, regulations and economics of power systems to integrate renewable power generation, electrical vehicles, demand response and energy storage systems. Currently, I am associate professor of Electrical power systems at the Department of Electrical Engineering, the University of Jordan. I am also the principal investigator of an industry-academia research project in Jordan that aims to harness storage and smart grid technologies in the transition towards the wide-scale adoption of solar PV across power grids (funded by the UK Royal Academy of Engineering). I am also currently consultant and technical supervisor for the 16 MW solar PV project at the University of Jordan. I have participated in multiple consultancy services related to the adoption of Smart Metering and Time of Use Tariff in the Jordanian electricity sector (under the Jordanian-German Energy Partnership) and the transition towards electric mobility in Jordan (member of the local expert team of the consulting services led by the World Bank Group).

Prior to joining the University of Jordan on Oct/2016, I was a Postdoctoral Research Associate in Network Integration of PV and storage at the School of Electrical and Electronic Engineering, University of Manchester (former UMIST), UK. I was responsible to develop techno-economics studies and business models to integrate smart grid technologies in the planning and the operation of future power system. In particular, I was involved in projects funded by The Engineering and Physical Sciences Research Council (EPSRC) titled “Whole system impacts and socio economics of wide scale PV integration (WISE PV)” and “Multi-energy storage social, techno-economic, regulatory and environmental assessment under uncertainty (MY-STORE)”.

I received the Ph.D. degree in Electrical Energy and Power Systems from the University of Manchester, UK, in April 2015 with thesis titled “Control of Distributed Generation and Storage: Operation and Planning Perspectives”. Between 2005 and 2011, I was with the Electricity Distribution Company (EDCO), Jordan as consultant and head of power system studies. My experience focuses on planning of electricity distribution, performance standards, energy efficiency, licensing, tariff methodologies and regulations. I also provided consultancy services to EDCO in order to perform techno-economic master plan of electricity distribution networks and the development of Geographical Information System (GIS). I was also member of the evaluation committees for Tenders at EDCO.

Employment History

Academic Experience

1. Associate Professor at The University of Jordan (Nov 2022- Present).
2. Assistant Professor at The University of Jordan (Oct 2016- Oct 2022).
3. Postdoctoral Research Associate in grid integration of PV and energy storage system, The University of Manchester, UK, (April 2015- Sep. 2016).
4. MSc Project Mentors at The University of Manchester, UK (April 2011- March 2015).

Industrial Experience

1. Consultant and technical supervisor for the 16 MW solar PV project at The University of Jordan, “Design, Engineering, Supply, Delivery, Installation, Testing, Commissioning, Cleaning and Maintenance of Grid-Connected 16 MW AC PhotoVoltaic Systems at The University of Jordan, Amman, Jordan”, (Jan 2019 – Present).
2. Consultant for the adoption of Smart Metering and Time of Use Tariff in the Jordanian electricity sector, GIZ (Jordanian-German Energy Partnership), 2022.
3. Consultant for the transition towards electric mobility in Jordan (member of the local expert team), World Bank Group, 2022.
4. Consultant for the 5-year master plan and the Geographical Information System (GIS) project at the Electricity Distribution Company (EDCO), Jordan (Feb 2010 - Jan 2011).
5. Head of power system studies section, EDCO, Jordan (Jan 2008 - Jan 2010).
6. Distribution network planning Engineer, EDCO, Jordan (May 2005 - Jan 2008).
7. Tender evaluation committee member, EDCO, Jordan (May 2005 - Jan 2010).

Education

2011- 2015	PhD in Electrical Engineering The University of Manchester (former UMIST) Manchester, UK. Electrical Energy and Power Systems Thesis Title: Control of Distributed Generation and Storage: Operation and Planning Perspectives
2005 – 2008	MSc in Electrical Engineering The University of Jordan Amman, Jordan
2000 – 2005	BSc in Electrical Engineering The University of Jordan Amman, Jordan

Publications

1. S. Althaher, **S. W. Alnaser**, Yue Zhou and Chao Long, “Transactive Energy System for Distribution Network Management: Procuring Residential Flexibility Services under Dynamic Pricing”, IEEE Access 10 (2022): 102019-102032.
2. Suad AlMattar, **Sahban W. Alnaser**, Sereen Althaher, “Dynamic Frequency Analysis of the Jordanian Power System with Significant Penetration of Renewables: Lessons Learnt from the COVID-19 Lockdowns”, IEEE Sustainable Power and Energy Conference (iSPEC), Perth, Australia, 2022.
3. Rilwan Usman, Pegah Mirzania, **Sahban W. Alnaser**, Phil Hart, Chao Long, “Systematic Review of Demand-Side Management Strategies in Power Systems of Developed and Developing Countries”, Energies 15, no. 21 (2022): 7858.

4. Dan Wang, Yue Zhou, Nian Liu, Meysam Qadrdan, Rohit Bhakar and **Sahban W. Alnaser**, "Planning, operation, and trading mechanisms of transactive energy systems in the context of carbon neutrality", *Energy Conversion and Economics* (2022).
5. **S. W. Alnaser**, S. Althaher, Chao Long, Yue Zhou, Jianzhong Wu and Reem Hamdan, "Transition towards solar Photovoltaic Self-Consumption policies with Batteries: From the perspective of distribution networks", *Applied Energy* 304 (2021): 117859.
6. Muhammed Sait Aydin, **Sahban W Alnaser**, Sereen Z Althaher, "Using OLTC-Fitted Distribution Transformer to Increase Residential PV Hosting Capacity: Decentralized Voltage Management Approach", *Energies* 15, no. 13 (2022): 4836.
7. **S. W. Alnaser**, S. Althaher, Chao Long, Yue Zhou, and Jianzhong Wu, "Residential Community with PV and Batteries: Reserve Provision under Grid Constraints", *International Journal of Electrical Power & Energy Systems* 119 (2020): 105856.
8. M. HajAhmed, M. Hawa, L. Shamlawi, **S. Alnaser**, Y. Alsmadi and D. Abu-nadi, "Cognitive Radio-Based Backup Protection Scheme for Smart Grid Applications", *IEEE Access* 8 (2020): 71866-71879.
9. **S. W. Alnaser**, S. Z. Althaher, "Grid Impact Analysis and Smart-Grid Control Strategies for PV-Rich Distribution Networks", *CIGRE Jordan Conference*, 2018.
10. **S. W. Alnaser** and L. F. Ochoa, Final Report for WP 1.1 and 1.2 "Wide-Scale Adoption of PV in UK Distribution Networks", 2017, WISE PV Project (EPSRC fund).
11. **S. W. Alnaser** and L. F. Ochoa, "Optimal sizing and control of energy storage in wind power-rich distribution networks", *IEEE Transactions on Power Systems* 31, no. 3 (2016): 2004-2013.
12. J. Quiros, L.F. Ochoa, **S. W. Alnaser**, T. Butler, "Control of EV Charging Points for Thermal and Voltage Management of LV Networks", *IEEE Transactions on Power Systems* 31, no. 4 (2016): 3028-3039.
13. **S. W. Alnaser** and L. F. Ochoa, "Optimal sizing and control of energy storage in wind power-rich distribution networks", *IEEE Power & Energy Society General Meeting Conference*, Boston, USA, 2016.
14. J. Quiros, L.F. Ochoa, **S. W. Alnaser**, T. Butler, "Control of EV Charging Points for Thermal and Voltage Management of LV Networks", *IEEE Power & Energy Society General Meeting Conference*, Boston, USA, 2016.
15. **S. W. Alnaser** and L. F. Ochoa, "Advanced Network Management Systems: A Risk-Based AC OPF Approach", *IEEE Transactions on Power Systems* 30, no. 1 (2014): 409-418.
16. **S. W. Alnaser** and L. F. Ochoa, "Advanced Network Management Systems: A Risk-Based AC OPF Approach", *IEEE PowerTech Conference*, Eindhoven, 2015.

17. **S. W. Alnaser** and L. F. Ochoa, "Towards Distribution Energy Management Systems: Maximising Renewable DG," 22nd International Conference on Electricity Distribution (CIRED), Stockholm, Sweden, 2013.
18. **S. W. Alnaser** and L. F. Ochoa, "Distribution Network Management System: An AC OPF Approach," IEEE Power & Energy Society General Meeting Conference, Vancouver, 2013.
19. **S. W. Alnaser** and L. F. Ochoa, "Hybrid controller of energy storage and renewable DG for congestion management," IEEE Power & Energy Society General Meeting Conference, San Diego, 2012.

Grant Received

"UK-Jordan Educational and Research Partnership to Build Capacity of Power Grid to Integrate Solar PV Systems", funded by UK Royal Academy of Engineering, 2018, £40,555 (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1055513/newton-fund-evaluation-case-study-jordan.pdf).

MSc Thesis Supervision

1. On The Role of Grid-Scale Battery Storage System in the Provision of Power System Services: Future Jordan's Electrical National Grid Perspective, 2022.
2. Digitalization and Automation of Power distribution Networks using Fiber Optics to Improve Reliability of Supply: Jordanian Distribution System Perspective, 2022.
3. Solar Photovoltaics (PV) and Energy Storage Systems for Power Resilience Enhancement in Weak Power Distribution Networks, 2022.
4. Optimal Design of a Hybrid CSP-PV plant in Jordan, 2021.

Journal Editor

1. IET Energy Systems Integration.
2. IET Energy Conversions and Economics (Special Issue on Planning, Operation and Trading Mechanisms of Transactive Energy Systems in the Context of Carbon Neutrality), 2021.

Editorial Reviewer for Journals

1. IEEE Transactions on Power Systems.
2. IEEE Transactions on Power Delivery.
3. IEEE Transactions on Smart Grids.
4. IEEE Transactions on Sustainable Energy.
5. Electric Power Systems Research.
6. IET Energy Systems Integration.
7. IET Energy Conversions and Economics.
8. IET Generation, Transmission & Distribution.

Invited Talks & Teaching

1. Erasmus+ Teaching Staff Mobility (STA) programme, School of Engineering, Lincoln University, UK, 2022/2023.
2. Showcasing excellent Projects from the Industry-Academia Partnership Programme, Royal Academy of Engineering (RAEng), UK, 2020 (Webinar).
3. Problem Based Learning conference in London, focusing on how engineers tackle the SDGs, Royal Academy of Engineering (RAEng), UK, 2020.
4. "The Role of Energy Policies and Residential Batteries in the Integration of Solar PV across Power Distribution Networks: Jordan Perspective", Centre for Integrated Renewable Energy Generation and Supply, Cardiff University, UK, 2020 "Virtual seminar".
5. "Wide-Scale Adoption of PV in Distribution Networks", Centre for Energy Systems and Strategy, Cranfield University, UK, 2019.
6. "Wide-Scale Adoption of PV in Distribution Networks", Centre for Integrated Renewable Energy Generation and Supply, Cardiff University, UK, 2019.

Taught Courses

1. Renewable Energy & Distributed Generation (0933786).
2. Smart Grids & Sustainable Electricity (0903780).
3. Power Distribution Systems (0943787).
4. Power System Analysis (0903481).
5. Electrical Circuits 1 (0903211).
6. Electrical Circuits 2 (EE-0903212).
7. Electrical Machines 1 (0903371).
8. Electrical Machines (Mechanical & Mechatronics Eng.).

Training

1. Low Carbon Networks & Innovation Conference, Glasgow, UK, 2019.
2. CIRED tutorial, Advanced distribution management system applications, Lyon, France, 2015.
3. One-week training course on Real-Time Digital Simulator (RTDS), University of Manchester, UK, 2014
4. EPRI Workshop on distribution network modelling for the smart grid, University of Manchester, UK, 2011.
5. Series of courses on distribution network planning, Jordan, 2009-2010. Provided by Mercados energy market international, Spain.
6. Building geodatabase for electricity distribution networks, Jordan, 2009. Provided by AED-SICAD, Germany.
7. ArcFMUT functionality and administration, Jordan, 2009. Provided by AED-SICAD, Germany.

8. Distribution and transmission tariff setting-methodologies and procedures, Jordan, 2007. Provided by Mercados energy market international, Spain.
9. Electrical Load Forecasting, Jordan, 2006. Organized by IEE Jordan Center.
- 10.Reduction of power system losses, Jordan, 2006. Organized by IEE Jordan Center.
- 11.CYMDIST/CYMTCC distribution system analysis Software. Jordan, 2005.

Memberships

1. Member of CIGRE Jordan Technical Committee (2021 – Present).
2. Member of the Institute of Electrical and Electronic Engineers (IEEE) (2011-Present).
3. Member of the Society of Jordanian Engineers (2005-Present).

Languages

1. English: Professional working proficiency.
2. Arabic: Native.
3. French: Basic.