

Osama S. Saadeh, PhD.

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Objective As an educator, I strive to enhance my students' knowledge, curiosity and interest in the discipline of electrical engineering. As a researcher, I aim to advance the state of the art in power electronics and power system research by performing quality research, and collaborating with others in the field. As an engineer I employ my expertise, knowledge and work ethics to produce and manage optimal engineering solutions.

Education

2007-2011 University of Arkansas, Fayetteville, Arkansas, USA

- **PhD in Electrical Engineering.**
- Dissertation Title: "*Modeling and Characterization of P-Type Silicon Carbide Gate Turn off Thyristors*"

2005-2007 University of Arkansas, Fayetteville, Arkansas, USA

- **MS in Electrical Engineering.**
- Thesis Title "*Modeling of p-type SiC Thyristors*"

2000-2004 Jordan University of Science & Technology Irbid-Jordan

- **BS in Electrical Engineering.**

1998-1999 Fayetteville High School, Fayetteville, Arkansas, USA

- Graduated as an Honor graduate

Professional Memberships

2001-present Member of the Institute of Electrical & Electronic Engineers (IEEE)

2004-present Member of the Jordan Engineers Association

2008-present Member of The National Electrical and Computer Engineering Honor Society "Eta Kappa Nu" (HKN)

2012-2016 JUST IEEE student branch academic advisor

2015-2017 JUST IEEE student WIE section counselor

2015-2017 JUST IEEE student IAS section counselor

2018-present International Solar Energy Society

Experience

October 2019 – Present , **German Jordanian University**
Associate Professor, Energy Engineering

Sept 2017 – October 2019, **German Jordanian University**
Assistant Professor, Energy Engineering

- Duties include teaching undergraduate and graduate classes, supervising undergraduate and graduate research projects, engaging in research projects.
- On several departmental committees, including curriculum committee, laboratory committee, hiring committee and senior design committee.

Sept 2011 – Sept 2017, **Jordan University of Science and Technology**
Assistant Professor, Electrical Engineering

- Duties include teaching undergraduate and graduate classes, supervising undergraduate and graduate research projects, engaging in research and evaluating some of the teaching laboratory needs.
- On several departmental committees, including ABET committee, curriculum committee, laboratory committee, hiring committee and senior design committee.

Sept 2014 – Sept 2016, **Jordan University of Science and Technology**
Energy Center Director

- Manage and direct energy policy and research at the university.
- Supervised the design and installation of 5 MW and 20MW PV systems and accompanying support infrastructure.
- On several university wide committees, including Sustainability and Center Quality.

May-August 2010, **General Electric Global Research**

Graduate Research Intern

- Intern in the Semiconductor Technology Lab. Duties included the modeling characterization and testing of state of the art, next generation power semiconductor devices.

May 2005 – August 2011, **University of Arkansas**

Research Assistant

- Tasks included high-end research in the areas of power electronics, power system applications, protective devices and semiconductor device modeling. This also includes maintaining the labs, and training new student on the equipment.
 - Research was part of the National Center for Reliable Electric Power Transmission (NCREPT) and the GRid-connected Advanced Power Electronics Systems (GRAPES) research center.
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Publications

Published or Accepted:

- **O. Saadeh**, Z. Dalala and S. Abukhadra "The Modeling and Simulation of Converting HVAC to HVDC Grids: Impact and Feasibility" *54th IEEE Industry Applications Society Annual Meeting, 2019*.
 - Z. Dalala, **O. Saadeh** and Ala Hussein, "A Current Sensorless Coulomb-Counting Method for Enhanced Battery SOC Estimation Accuracy" *2019 IEEE Energy Conversion Congress & Exposition (ECCE), 2019*.
 - H. Qdais, **O. Saadeh**, M. Al-Widyan, R. Atal and M. Abu-Dalo "Environmental sustainability features in large university campuses: Jordan University of Science and Technology (JUST) as a model of green university", *International Journal of Sustainability in Higher Education*, Vol. 20, June 2019.
DOI: 10.1108/IJSHE-06-2018-0102
 - Z. Dalala and **O. Saadeh**, "A Novel Reduced Voltage Sensor-Count Control of a DC/DC Converter" *2018 IEEE Energy Conversion Congress & Exposition (ECCE), 2018*.
 - Z. Dalala, **O. Saadeh**, M. Bdour and Z. Zahid, "A New Maximum Power Point Tracking (MPPT) Algorithm for Thermoelectric Generators with Reduced Voltage Sensors Count Control" *Energies*, Vol. 11, July 2018, pp. 1826-1842.
DOI: 10.3390/en11071826
 - **O. Saadeh**, Z. Dalalah, F. Nessir Zghoul, A. Abuelrub and M. Saadeh, "A 500 kHz Silicon Carbide (SiC) Single Switch Class-E Inverter" *International Journal of Electrical and Electronic Engineering & Telecommunications*, Vol. 7, July 2018, pp. 103-107. DOI: 10.18178/ijeetc.7.3.103-107
 - **O. Saadeh**, M. Dalbah and Z. Dalala "Control of two Five-Phase Parallel Connected Single Source Motor Drives under Balanced and Unbalanced Conditions" *IEEE 9th International Symposium on Power Electronics for Distributed Generation Systems (PEDG), 2018*.
 - Z. Dalala and **O. Saadeh**, "A New Robust Control Strategy for Multistage PV Battery Chargers" *IEEE 9th International Symposium on Power Electronics for Distributed Generation Systems (PEDG), 2018*.
 - **O. Saadeh**, R. Rabady and M. Bani Melhem, "New effective PV battery charging algorithms" *Solar Energy*, Vol. 166, May 2018, pp. 509-518.
DOI:10.1016/j.solener.2018.03.075
 - Z. Dalalah, Z. Zahid, **O. Saadeh**, J. Lai "Modeling and Controller Design of a Bidirectional Resonant Converter Battery Charger" *IEEE Access*, Vol. 6, April 2018, pp. 23338-23350. DOI:10.1109/ACCESS.2018.2830321
 - A. Abuelrub, **O. Saadeh** and H. Al-Masri, "Scenario Aggregation-Based Grid-Connected Photovoltaic Plant Design" *Sustainability*, Vol. 10(4), April 2018, pp. 1275-1288. DOI:10.3390/su10041275
 - A. Abuelrub, H. Al-Masri and **O. Saadeh** "Grid-connected photovoltaic plant design at Jordan University of Science and Technology using scenario aggregation" *2018 International Conference on Power, Energy and Mechanical Engineering (ICPEME), 2018*.
 - **O. S. Saadeh** and M. M. Dalbah, "Control of Five Phase Two-Motor Series Connected Single Source Drive Systems under Balanced and Unbalanced Conditions". *Journal of Engineering and Applied Sciences*, Vol. 12, December 2017, pp. 7098-7103. DOI:10.3923/jeasci.2017.7098.7103
 - F. Nessir Zghoul, S. Ay and **O. S. Saadeh**, "Protraction of Bartlett Bisection Theorem to Cross Coupled Circuits". *Journal of Engineering and Applied Sciences*, Vol. 12, December 2017, pp. 7104-7111. DOI:10.3923/jeasci.2017.7104.7111
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- M. Saadeh, R. McCann, M. Alsarray, **O. Saadeh**, “A new approach for evaluation of the bus admittance matrix from synchrophasors: (A statistical Ybus estimation approach)”. *International Journal of Electrical Power & Energy Systems*, Vol. 93, December 2017, pp. 395–405. DOI: 10.1016/j.ijepes.2017.06.021
- **O. S. Saadeh** and M. R. Al-Mothafar, “Power Electronics Laboratory Education: the JUST Experience”. *2017 IEEE First Ukraine Conference on Electrical and Computer Engineering (UKRCON)*, 2017.
- **O. S. Saadeh**, H. A. Mantooh, J. C. Balda, “The Modeling and Characterization of Silicon Carbide Gate Turn Off Thyristors” *2012 IEEE Energy Conversion Congress & Exposition (ECCE)*, 2012.
- **O. S. Saadeh**, E. D. Johnson, M. S. Saadeh, A. E. Mejia, C. Schirmer, B. Rowden, A. Mantooh, J. Balda, S. Ang, “A 4 kV Silicon Carbide Solid-State Fault Current Limiter” *2012 IEEE Energy Conversion Congress & Exposition (ECCE)*, 2012.
- Z. Stum, A.V. Bolotnikov, P. A. Losee, K. Matocha, S. Arthur, J. Nasadoski, R. R. Rao, **O. S. Saadeh**, L. Stevanovic, R. L. Myers-Ward, C. R. Eddy Jr., D. K. Gaskill, “4kV Silicon Carbide MOSFETs” *Material and Science Forum*, Vol. 637, March 2011, pp. 679-680.
- Y. Feng, E. Johnson, **O. Saadeh**, J. C. Balda, H. A. Mantooh, and M. Schupbach, “Impact of solid-state fault current limiters on protection equipment in transmission and distribution systems” *2010 IEEE PES T&D Conference & Exposition*, 2010.
- S.S. Ang, T. Tao, **O. S. Saadeh**, E. Johnson, B. Rowden, J.C. Balda, A. Mantooh, “Packaging and characterization of silicon carbide thyristor power modules” *Power Electronics and Motion Control Conference, 2009. IPEMC '09*.
- **O. S. Saadeh**, H. A. Mantooh, J. C. Balda, A. K. Agarwal, A. S. Kashyap, “The Modeling and Characterization of Silicon Carbide Thyristors” *39th IEEE Power Electronics Specialists Conf (PESC)*, 2008.
- H. A. Mantooh, **O. Saadeh**, E. Johnson, J.C. Balda, S.S. Ang, A.B. Lostetter, R. M. Schupbach, “Solid-State Fault Current Limiters: Silicon versus Silicon Carbide” *2008 PES General meeting(PESGM)*.
- E. Johnson, **O. S. Saadeh**, J.C. Balda, H. A. Mantooh, S. S. Ang, “An Analysis of Paralleled SiC Bipolar Devices” *39th IEEE Power Electronics Specialists Conf (PESC)*, 2008.

Languages

Fluent speaker of both Arabic & English. Excellent writing skills in both languages.

Software Skills

C, C++, Visual Basic, Visual C++, MatLab, MAST, PSPICE, SABER, PSIM, ETAP, PowerWorld, Neplan, OSeMOSYS

Attended Workshops

- “Arc Flash/NFPA 70E”, Eaton Corporation, Tulsa, OK, 2009.
- “Solar Cooling”, GiZ and Jordan Ministry of Environment, Irbid, Jordan, 2014.
- “Integration of Renewable Energy Resources in the Transmission and Distribution Networks in the Arab Region”, ESCWA, Amman, Jordan, 2015.
- “E-learning: Open Educational Resources”, JUST ADC, Irbid, Jordan, 2015.
- “Introduction to Biostatistical and Statistical Analysis using JMP Software”, JUST ADC, Irbid, Jordan, 2016.
- “Joint Summer School on Modelling Tools for Sustainable Development – OpTIMUS: Open Source Energy Modelling System (OSeMOSYS)”, International Center for Theoretical Physics (ICTP), Trieste, Italy, 2019.

Hardware Skills

High power high temperature (500° C) probe station, bench top equipment (power supplies, scopes, function generators ...), curve tracers, microprocessors. MV and HV CB and switch gear. Traditional and Solid state protective equipment. Next generation Smart Grid technologies. Built high current (5000 A) and high voltage (20 kV) device characterization test circuits. Designed, built and tested a high power (4160 V, 4000 A) fault current limiter. Renewable energy deployment, and integration, Resonant Converters and wireless power systems.

Research Project

- **Partner:** “Energy Smart Mediterranean Schools Network / (ESMES)” ENI CBC MED Reference number A_B.4.3_0123
- **PI:** “Modeling and Characterization of Wide-bandgap Power Semiconductor Devices.” GJU Project ID SNRE 02/2018.
- **CO-PI:** “A photovoltaic System connection and sizing design methodology based on system modeling and simulation”. JUST Project ID 9/2018.
- **Contractor:** “Fostering Renewable Energy (RE) and Energy Efficiency (EE) Initiatives in Jordan Building Sector - REEED”. A project co-funded by the EU, the contracting authority is the Ministry of Energy and Mineral Resources. The project is run by ICU in partnership with the National Centre for Agricultural Research and Extension. Contracted as a “Third Party” to validate energy consumption reduction and estimate CO2 emission reduction and training services.
- **Partner:** “Smart Control Systems for Energy Management: New Master Degree/ (SEM-SEM)” Erasmus+ Project Reference Number 561703-EPP-1-2015-1-UK-EPPKA2-CBHE-JP.
- **Partner:** “Modernising Undergraduate Renewable Energy Education: EU Experience for Jordan (MUREE)” TEMPUS project number 530332-TEMPUS-1-2012-1-JO-TEMPUS-JPCR.
- **PI:** “Designing, simulating and building a Silicon Carbide (SiC) - based uninterruptible power supply (UPS) system.” JUST Project ID 216/2014.
- **CO-PI:** “Investigating the effect of integrating simulations with measurements on the course outcomes of the power electronics lab at JUST” JUST Project ID 182/2012.

Current Research Interest

Modeling and characterization of power semiconductor devices, wide bandgap semiconductors, power electronic interfaces and grid applications, inverters, converters, resonant converters, wireless power transfer, LED lighting, power system protection, power quality, three phase power recirculation, renewable energy, smart grid applications, electric vehicles and distributed energy resources.

Engineering Project

- JUST 5 MW PV system: Prepared the ToR documents, lead the proposal technical evaluation committee, participated in the proposal financial evaluation committee, awarded the tender, supervising purchasing, construction, integration and complete system commissioning.
 - JUST 20 MW PV system: Prepared the ToR documents, member of proposal technical and financial evaluation committee.
 - Sports City lighting systems: Studied tender documents for several Jordanian sports city lighting upgrade, studied submitted proposal, awarded tender.
 - JUST 33/11 kV substation upgrade: prepared RFP documents.
 - Jordan CubeSat Project: Advisor for student team in charge of building power system for the Jordan CubeSat, project sponsored Crown Prince Foundation (CPF).
 - The University of Jordan (JU) renewable energy advisory board: part of team advising Jordan University on path of power sustainability.
 - “Total Jordan” education and outreach steering committee.
 - JUST Sustainability Committee: measured current sustainability markers on campus, CO2 emissions, CO2 sink, and part of team that prepared the university’s sustainability policy.
 - JUST administrative building LED project: supervised the redesign of the lighting system at the new administrative building at JUST.
 - Energy Service Provider Accreditation Committee Member, A USAID-funded activity implemented by Deloitte.
 - Jordan Aircraft Maintenance Limited (JORAMCO): Consultant for CO2 Emission calculations and energy efficiency measures.
 - Mutah University 5 MW PV system: member of technical evaluation committee.
 - Al - Balqa' Applied University 7 MW and 10 MW PV system: member of technical and financial evaluation committee
 - The University of Jordan (JU) 16 MW PV system: member of technical and financial evaluation committee.
 - National Electric Power Company, Jordan: Industry/Academy Steering Committee
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Training Courses Delivered

1. Arkansas Power Electronics International (APEI), Arkansas, USA: Modern Power Electronics and Power Semiconductor Devices, May 2011.
 2. Abu Dhabi Gas Industries Ltd. (GASCO), Abu Dhabi, UAE: Operation & Maintenance of Circuit Breakers and Switchgear, December 2012.
 3. Abu Dhabi Gas Industries Ltd. (GASCO), Abu Dhabi, UAE: HV Cables Jointing and Termination, November 2013.
 4. Abu Dhabi Gas Industries Ltd. (GASCO), Abu Dhabi, UAE: MV Variable Speed Motor Drives, April 2014.
 5. Management Science Institute, Dubai, UAE: Operation and Maintenance of High Voltage Switchgear and Transformers, August 2014.
 6. Abu Dhabi Gas Industries Ltd. (GASCO), Abu Dhabi, UAE: AC Electric Motors and Drives, September 2014.
 7. Abu Dhabi Gas Industries Ltd. (GASCO), Abu Dhabi, UAE: Transformer Maintenance & Testing, January 2015.
 8. Abu Dhabi Gas Industries Ltd. (GASCO), Abu Dhabi, UAE: Variable Speed Drives, February 2016.
 9. Norwegian Refugee Council Jordan office, Ministry of Education Engineers, Irbid, Jordan: Solar Technology: monitoring and maintenance of PV systems, August 2016.
 10. Energy Center, Jordan University of Science and Technology. Irbid, Jordan: Introduction to PV Systems, August 2016.
 11. Istituto per la Cooperazione Universitaria ONLUS Jordan office, National Center for Agricultural Research and Extension, Amman, Jordan: Energy Efficiency Systems, December 2016.
 12. Istituto per la Cooperazione Universitaria ONLUS Jordan office, Jordan University of Science and Technology, Irbid, Jordan: Introduction to PV System Design, Operation & Maintenance, January 2017.
 13. Istituto per la Cooperazione Universitaria ONLUS Jordan office, National Center for Agricultural Research and Extension, Mafraq, Jordan: Solar Pumps, February 2017.
 14. Istituto per la Cooperazione Universitaria ONLUS Jordan office, National Center for Agricultural Research and Extension, Shoubak, Jordan: Solar Pumps, March 2017.
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Courses Studied

Communication: Analog Communications, Digital Communications, Mobile Communications, Digital Filters, Communication Systems and Wireless Data Communication.

Electronics: Basic Electronics, Digital Electronics, Microwave Electronics, Power Electronics, Communication Electronics, Semiconductor Devices and Power Semiconductor Devices.

Power Systems: Power Systems, Electric Power Distribution and Transmission Systems, Switch Mode Power Converters, Power System Analysis, Power System Control, Motor Drives, Power System Quality and Power System Protection.

Integrated Circuits: IC Design, IC design Lab, IC Fabrication, IC Fabrication Lab and Analog IC Design.

Computer: C programming, Digital Design, Microprocessor, and Computer Networks

Management: Commercialization of Research, Ethics for Scientists and Engineers.

Teaching Experience

Electronics II; Circuits I & II; Power Electronics; Power Semiconductor Devices; Switch Mode Power Converters; Power System Analysis; Power System Protection; Power System Quality; Power System Distribution and Transmission; Power System Operation; Smart-Grid Power Systems; Electrical Power Generation, Transmission & Distribution; Special Topics in Renewable Energy Systems; Circuits Lab; Electronics Lab and Power Electronics Lab.

**Supervised
MS Theses**

- *Quantifying Electric Grid limiting Factors for PV integration, Abedallah Alkhresheh, GJU, January 2020.*
 - *PV System Islanding Mode Operation with G59 Protection, Wael Al-Hanainah, GJU, January 2020.*
 - *An Intelligent Electrical Vehicle-Grid Interface for Mitigation of Power Quality Issues, Anwar Al-Nawasrah, GJU, November 2019.*
 - *Characterization of Windwide-Bandgap Power Semiconductors Devices, Ahmad Al-Hmoud, GJU, August 2019.*
 - *The Feasibility and Environmental Impact of Green Streets as a Sustainable Alternative: Amman Bus Rapid Transit Project as a Case Study, Omar Al Banna, GJU, March 2019.*
 - *A Photovoltaic System Connection and Sizing Design Methodology Based on System Modeling and Simulation, Eman Al-Maghrabi, JUST, January 2019.*
 - *Impact Assessment of Integrating Renewable Energy Systems on the National Grid of Yemen, Waleed Abdullah Ahmed Ali, JUST, December 2017.*
 - *Control of Five Phase Two-Motor Drive System Supplied From a Single Inverter Under Balanced and Unbalanced Conditions, Monther Mahmoud Dalbah, JUST, October 2016.*
 - *Design Of An Advanced Controller for Effective Battery Charging from Photovoltaic Cells, Muath Mohammed Bani Melhem, JUST, July 2016.*
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