

Zakariya M. Dalala, Ph.D.

German Jordanian University

Energy Engineering Department

P.O. Box 35247, Amman 11180 Jordan

Tel : +962 6 429 4215 Cellular: +962795788085

E-mail: dalala@qju.edu.jo

Education:

- **2010-2014:** Virginia Polytechnic Institute and State University, Virginia, USA
Ph.D. in Electrical Engineering, Electrical & Computer Engineering Department.
Ph.D. Dissertation: "Design and Analysis of a Small-Scale Wind Energy Conversion System"
- **2005-2008:** University of Jordan, Jordan
MS. in Electrical Engineering.
Master Thesis: "Optical Wavelength division Demultiplexing with Monitoring Channels"
- **2000-2005:** Jordan University of Science and Technology.
BS. in Electrical and Electronics Engineering.
- **1999-2000:** AlZarnouji Secondary School, Urbid
Secondary School Certificate, scientific stream.

Employment History:

- **September 2022 – Present:**
Professor, German Jordanian University, Energy Engineering Department.
- **September 2018 – September 2022:**
Associate Professor, German Jordanian University, Energy Engineering Department.
- **September 2016 – September 2019:**
Head of Energy Engineering Department, School of Natural Resources Engineering and Management, German Jordanian University.
- **September 2016 – September 2019:**
Master Programs Coordinator, School of Natural Resources Engineering and Management, German Jordanian University.
- **February 2016 – February 2017:**
Assistant Dean, School of Natural Resources Engineering and Management, German Jordanian University.
- **June 2014 – September 2018:**
Assistant Professor, German Jordanian University, Energy Engineering Department.

▪ **December 2013 – June 2014:**

Design Engineer III, Research and Development Section, Regal Beloit America, Blacksburg, VA 24060 USA

- Development of power electronics, control implementation and verification using MCUs for variable speed motor drives of various power ranges from medium power (400 Hp) to fractional HP.

▪ **July 2010 – December 2013:**

Graduate Research Assistant at Future Energy Electronics (FEEC), Virginia Tech.

-Joining various in-lab research projects with duties including:

- Hardware design and implementation.
- Testing and installation.
- Power electronics converters modeling and control.
- Renewable energy power electronics development for solar and wind energy.

▪ **August 2008 to August 2009:**

At German-Jordanian University as Teaching Assistant Electrical Engineer.

- Supervision on Electrical Engineering Labs.
- Teaching various Electrical Engineering labs, including Electronics, Digital Electronics, Circuits and Digital Design labs for undergraduate levels.
- Engineering Labs monitoring, improvement and manual creation and revision.

▪ **May 2005 to June 2008:**

At Antares Advanced Test Technology – United States / DCI (Dimensions Consulting Incorporation) / Jordan Division as a PCB Layout Design Engineer. My main responsibilities varied as follows:

- PCB layout designer. Board divisions: Design of high-performance PCB boards to include load boards, DUT cards, Tester interface boards, Random logic boards and customer specific bench boards and producing manufacturing plots and design reports.
- Utilize Cadence Allegro Design package, CIS and Concept HDL.

Projects and Research:

– Metrics (as of December 24th, 2022). Source Google Scholar:

Citations: **1129**

H-index: **15**

i10 index: **18**

Funded Projects:

- **Partner:** “Green City – Territorial Partnerships For Sustainable and Resilient Urban Development”, (€1.125 Million) Funded by Agenzia italiana per la cooperazione allo sviluppo (AICS), 2021-2023.
- **Member:** CliEEN – the Climate-Economy-ENergy Modelling Network, Part of DIAPOL-CE “Policy Dialogue and knowledge management on low emission strategies in the MENA Region” Under the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. 2021.
- **Partner:** “Increasing Access and Planning for Efficient Cooling Solutions in Jordan” K-CEP’s NDC Support Facility for Efficient, Climate-Friendly Cooling program under KIGALI Cooling

Efficiency Program. (<https://k-cep.org/insights/news/ndc-support-facility-awardees-announced/>) (\$619,000.00), 2021-2023.

- **PI:** "Integrating Energy Economy Modelling Concepts in the Energy Engineering Curriculum at the German Jordanian University (GJU) – Jordan." GiZ Agreement number 81262854. 2019.
- **Partner:** "Energy Smart Mediterranean Schools Network / (ESMES)" ENI CBC MED Reference number A_B.4.3_0123. (<http://www.enicbmed.eu/projects/esmes>). (€3.3 million) Funded by EU under ENI CBC MED program, 2019-2022.
- **Member:** MENA Network on Climate-Energy-Economy Modelling, Part of DIAPOL-CE "Policy Dialogue and knowledge management on low emission strategies in the MENA Region" Under the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. 2019.
- **Member:** "Microwave based faecal sludge treatment" (<http://microwave-based-faecal-sludge-treatment.un-ihe.org/>) (€300,000.00). Funded by DUPC2, Dutch Ministry of Foreign Affairs. 2017-2020.
- **PI:** "Energy Harvesting Using Thermoelectric Generators" Support to Research, Technological Development and Innovation in Jordan (SRTD - II). (€25,000.00). 2015-2017.
- **PI:** "Design and Implementation of a Resonant Bidirectional Charger for EVs" SEED Grant, German Jordanian University (\$42,000.00) 2015-2017.
- **Member:** "Efficiency of PV Systems in Jordan Valley". Scientific Research Support Fund (SRF). (\$150,000.00). 2015-2018.
- **Member:** "Biogas Production in Local Communities in Jordan" (€780,000.00), Funded by European Union (<http://www.biogas-in-jordan.org/index.html>). 2015-2019.

Research Projects:

- Design, modeling and implementation of three-phase boost rectifier for **Wind Energy** conversion system.
- Design and implementation of a bidirectional onboard battery charger for **Electric Vehicle (EV)** using CLLLC resonant converters.
- Design, modeling and implementation of three-phase current source inverter for **Motor Drive** application.
- Sinusoidal PM machine drive with low resolution Hall-Effect Position sensors plus sensorless control implementation.
- Complete PCB design for high performance DSP chip (TMS320F28335) application board (responsible for designing, testing and verification of the complete system interface board using Cadence tools).

Key Course Work and design skills:

- Modeling and control of DC/DC PWM converters.
- Modeling and Control of 3-Phase PWM converters (AC/DC).
- Advanced linear control theory.
- Advanced power conversion: design, modeling and control .
- Advanced control engineering.
- Advanced digital control systems.
- Advanced digital signal processing.
- Alternative Energy Systems.

- Power Electronics: Design, Modeling and Control.
- **Design and modeling packages:** PSIM, Simplis, Orcad, Matlab, Mathematica, LTspice, Saber, Allegro, OrCAD, Altium Designer.

Publications:

REFEREED JOURNALS:

- Al-Refai, Abdullah, Abedalrhman Alkhateeb, and **Zakariya M. Dalala**. "Enhancing the LCO 18,650 Battery Charging/Discharging Using Temperature and Electrical Based Model" *Batteries*. **2022**; 8, no. 11: 199. <https://doi.org/10.3390/batteries8110199>
- **Zakariya Dalala**, Murad Al-Omari, Mohammad Al-Addous, Mathhar Bdour, Yaqoub Al-Khasawneh, Malek Alkasrawi "Increased renewable energy penetration in national electrical grids constraints and solutions" *Energy*, Volume 246, May **2022**, ISSN 0360-5442, doi.org/10.1016/j.energy.2022.123361.
- **Zakariya M Dalala**, Saba Z AlAqbani, Dima R Khirfan, Layth H Alhamad, Mohammad Al-Addous, Nesrine Barbana "Analysis and Design Methodology of a Novel Integration Topology of Storageless Off-Grid PV Systems" *Energies*, Vol. 15, February **2022**, doi.org/10.3390/en15041279
- **Zakariya Dalala**, Taha Alwahsh, Osama Saadeh "Energy recovery control in elevators with automatic rescue application" *Journal of Energy Storage*, Vol. 43, November **2021**, [DOI:10.1016/j.est.2021.103168](https://doi.org/10.1016/j.est.2021.103168)
- Mohammad M Hamed, Adnan Al-Masri, **Zakariya M Dalala**, Raed J AlSaleh "Modeling the Time Duration Until the Adoption of Residential Rooftop Solar Photovoltaic Systems", *Journal of Energy Resources Technology*, Vol. 144, issue 4, July **2021**. [DOI:10.1115/1.4051572](https://doi.org/10.1115/1.4051572)
- Eva Kocbek, Hector A. Garcia, Christine M. Hooijmans, Ivan Mijatović, Mohammad Al-Addous, **Zakariya Dalala**, Damir Brdjanovic, "Novel semi-decentralised mobile system for the sanitization and dehydration of septic sludge: a pilot-scale evaluation in the Jordan Valley" *Environ Sci Pollut Res* (2021). <https://doi.org/10.1007/s11356-021-17018-z>.
- **Z. Dalala**, M. Alnawafa, O. Saadeh and E. Alnawafa "Reducing Commuter CO2 Footprint through Transit PV Electrification" *Sustainability*, Vol. 12, August **2020**. [DOI:10.3390/su12166406](https://doi.org/10.3390/su12166406)
- Bdour, M.; **Dalala, Z.**; Al-Addous, M.; Radaideh, A.; Al-Sadi, A. A Comprehensive Evaluation on Types of Microcracks and Possible Effects on Power Degradation in Photovoltaic Solar Panels. *Sustainability* 2020, *12*, 6416. <https://doi.org/10.3390/su12166416>
- O. Saadeh, A. Al Nawasrah and **Z. Dalala** "A Bidirectional Electrical Vehicle Charger and Grid Interface for Grid Voltage Dip Mitigation" *Energies*, Vol. 13, July **2020**. [DOI: 10.3390/en13153784](https://doi.org/10.3390/en13153784)
- **Z. Dalala**, O. Al Banna and O. Saadeh "The Feasibility and Environmental Impact of Sustainable Public Transportation: A PV Supplied Electric Bus Network" *Applied Sciences*, Vol. 10, June **2020**. [DOI:10.3390/app10113987](https://doi.org/10.3390/app10113987)
- **Z. Dalala**, M. Al-Addous, F. Alawneh, CB Class, "Environmental data set for the design and analysis of the Photovoltaic system in the Jordan Valley" *Data in brief*, **2020**, Vol. 31, 105794. [DOI: 10.1016/j.dib.2020.105794](https://doi.org/10.1016/j.dib.2020.105794).
- Osama Saadeh; Anwar Al Nawasrah; **Zakariya Dalala**. "A Bidirectional Electrical Vehicle Charger and Grid Interface for Grid Voltage Dip Mitigation" *Energies*, Vol. 13, July **2020** no. 15: 3784. [DOI:10.3390/en13153784](https://doi.org/10.3390/en13153784)
- O Saadeh, A Al-Hmoud, **Z Dalala**, "Characterization Circuit, Gate Driver and Fixture for Wide-Bandgap Power Semiconductor Device Testing", *Electronics*, **2020**, 9, 703. doi.org/10.3390/electronics9050703

- Jaradat, M.; Al-Addous, M.; Albatayneh, A.; **Dalala, Z.**; Barbana, N. Potential Study of Solar Thermal Cooling in Sub-Mediterranean Climate. *Appl. Sci.* **2020**, *10*, 2418. doi.org/10.3390/app10072418
- M Al-Addous, M Jaradat, M Bdour, **Z Dalala**, J Wellmann, “Combined concentrated solar power plant with low-temperature multi-effect distillation”, *Energy Exploration & Exploitation*, Vol. 38, pp. 1831-1853, March **2020**, DOI: [10.1177/0144598720913070](https://doi.org/10.1177/0144598720913070)
- O. Saadeh, **Z Dalala**, T Niet, EP Ramos, M Howells, “Technoeconomic Data Adopted for the Development of a Long-term Electricity Supply Model for the Hashmite Kingdome of Jordan”, *Data in Brief*, Vol.30, **2020**, 105391, ISSN 2352-3409, DOI:[10.1016/j.dib.2020.105391](https://doi.org/10.1016/j.dib.2020.105391).
- M Bdour, **Z Dalala**, M Al-Addous, A Kharabsheh, H Khzouz, “Mapping RO-Water Desalination System Powered by Standalone PV System for the Optimum Pressure and Energy Saving”, *Appl. Sci.* **2020**, *10*(6), 2161; DOI: [10.3390/app10062161](https://doi.org/10.3390/app10062161).
- Mohammad Al-Addous, Motasem Saidan, Mathhar Bdour, **Zakariya Dalala**, Aiman Albatayneh, Christina B Class, “Key aspects and feasibility assessment of a proposed wind farm in Jordan”, *International Journal of Low-Carbon Technologies*, Volume 15, Issue 1, February **2020**, Pages 97–105, doi.org/10.1093/ijlct/ctz062
- Mohammad Al-Addous, **Zakariya Dalala**, Firas Alawneh, Christina B. Class, “Modeling and quantifying dust accumulation impact on PV module performance”, *Solar Energy*, Volume 194, **2019**, Pages 86-102, ISSN 0038-092X. doi.org/10.1016/j.solener.2019.09.086.
- Aiman Albatayneh, Sulaiman Mohaidat, Atif Alkhazali, **Zakariya Dalala**, Mathhar Bdour, “The Influence of Building’s Orientation on the Overall Thermal Performance”, *International Journal of Environmental Science & Sustainable Development*, **2018**,
- **Zakariya M. Dalala**, Osama Saadeh, Mathhar Bdour and Zaka Ullah Zahid, “A New Maximum Power Point Tracking (MPPT) Algorithm for Thermoelectric Generators with Reduced Voltage Sensors Count Control”, *Energies*, **2018**, *11*, 1826; DOI:[10.3390/en1107182](https://doi.org/10.3390/en1107182).
- **Zakariya M. Dalala**, Zaka Ullah Zahid, Osama S. Saadeh, and Jih-Sheng Lai, “Modeling and Controller Design of a Bidirectional Resonant Converter Battery Charger”, *IEEE Access*, Volume 6, 2018. PP. 23338- 23350.
- Osama Saadeh, **Zakariya Dalala**, Fadi Nessir Zghoul, Ahmad Abuelrub, Mahmood Saadeh, “A 500 kHz Silicon Carbide (SiC) Single Switch Class-E Inverter”, *International Journal of Electrical and Electronic Engineering & Telecommunications*, Volume 7, issue 3, July, **2018**, Pages 103 – 107.
- Mohammad Al-Addous, **Zakariya Dalala**, Christina B. Class, Firas Alawneh, Hussein Al-Taani, “Performance analysis of off-grid PV systems in the Jordan Valley”, In *Renewable Energy*, Volume *113*, **2017**, Pages 930-941, ISSN 0960-1481
- Zahid, Z.U., **Zakariya M. Dalala.**, Chen, R.; Chen, B., Jih-sheng Lai, “Design of Bidirectional DC-DC Resonant Converter for Vehicle-to-Grid (V2G) Applications” *IEEE Transactions on Transportation Electrification*, Volume: PP, Issue: 99, **2015**.
- Zahid, Z.U.; **Dalala, Z.M.**; Cong Zheng; Rui Chen; Faraci, W.E.; Lai, J.-S.J.; Lisi, G.; Anderson, D. “Modeling and Control of Series-Series Compensated Inductive Power Transfer System”, *IEEE Journal of Emerging and Selected Topics in Power Electronics*, Volume: 3, Issue:1, **2015**.
- **Zakariya M. Dalala**, Zaka Ullah Zahid, Wensong Yu, Younghoon Cho and Jih-Sheng Lai, “Design and Analysis of a MPPT Technique for Small Scale Wind Energy Conversion Systems” *IEEE Transactions on Energy Conversion*, vol. 28, issue 3, pp. 756-767, **2013**.
- **Zakariya M. Dalala**, Zaka Ullah Zahid and Jih-Sheng Lai, “New Overall Control Strategy for Small Scale WECS in MPPT and Stall Regions with Mode Transfer Control” *IEEE Transactions on Energy Conversion*, vol.28, issue 4, pp. 1082-1092. **2013**.

CONFERENCES:

- **Z. M. Dalala**, O. S. Saadeh and Z. U. Zahid, "Second Life Battery Energy Storage System: Modular Interface and Control," *2022 IEEE 13th International Symposium on Power Electronics for Distributed Generation Systems (PEDG)*, 2022, pp. 1-6, doi: 10.1109/PEDG54999.2022.9923152.
- O. S. Saadeh, W. Al-Hanaineh and **Z. Dalala**, "Islanding mode operation of a PV supplied network in the presence of G59 protection," *2022 IEEE 13th International Symposium on Power Electronics for Distributed Generation Systems (PEDG)*, 2022, pp. 1-5, doi: 10.1109/PEDG54999.2022.9923097.
- **Z. Dalala**, O. Saadeh and A. A. Hussein, "A Current Sensorless Coulomb-Counting Method for Enhanced Battery State-of-Charge Estimation Accuracy," *2019 IEEE Energy Conversion Congress and Exposition (ECCE)*, Baltimore, MD, USA, 2019, pp.1131-1135. doi: 10.1109/ECCE.2019.8913024
- O. S. Saadeh, **Z. M. Dalala** and S. Abukhadra, "The Modeling and Simulation of Converting HVAC to HVDC Grids: Impact and Feasibility," *2019 IEEE Industry Applications Society Annual Meeting*, Baltimore, MD, USA, 2019, pp. 1-6. doi: 10.1109/IAS.2019.8912345
- **Z. M. Dalala** and O. S. Saadeh, "A Novel Reduced Voltage Sensor-Count Control of a DC/DC Converter," *2018 IEEE Energy Conversion Congress and Exposition (ECCE)*, 2018, pp. 1449-1452, doi: 10.1109/ECCE.2018.8557770.
- **Zakariy M. Dalala**, Osama S. Saadeh, "A New Robust Control Strategy for Multistage PV Battery Chargers", *IEEE 9th International Symposium on Power Electronics for Distributed Generation Systems*, 2018.
- O. Saadeh, M. Dalbah, **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*, 2018.
- Mohammad Alhashem, Salem Alaghtash, Mohanad Batarseh, **Zakariya M. Dalala**, "Scheduling Approach for Connected Micro-Grid System", *IEEE 9th International Symposium on Power Electronics for Distributed Generation Systems*, 2018.
- Mohammad Al-Addous, Hussein Al-Taani, **Zakariya Dalalah**, Firas Alawneh, Aiman Albatayneh, "Wind Resources Assessment for a Proposed Wind Farm", *International Experts for Research Enrichment and Knowledge Exchange The Academic Research Community Publication*, 2017.
- Mohammad Al-Addous, Firas Alawneh, **Zakariya Dalalah**, Christina B. Class, Hussein Al-Taani, "Design and Implementation of Water Desalination System (RO) Using Renewable Energy Source", *International Experts for Research Enrichment and Knowledge Exchange The Academic Research Community Publication*, 2017
- **Zakariya M. Dalala**, Zaid S. Hamdan, Hussein Al-Taani, Mohammad Al-Addous, Aiman Albatayneh, "Battery Charging Application with Thermoelectric Generators as Energy Harvesters", *International Experts for Research Enrichment and Knowledge Exchange The Academic Research Community Publication*, 2017
- **Z. M. Dalala**, Z. U. Zahid and J. S. J. Lai, "Modeling and controller design of a bidirectional resonant converter battery charger," *2016 Asian Conference on Energy, Power and Transportation Electrification (ACEPT)*, Singapore, 2016, pp. 1-7.
- **Z. M. Dalala**, "Energy harvesting using thermoelectric generators," *2016 IEEE International Energy Conference (ENERGYCON)*, Leuven, 2016, pp. 1-6.
- **Zakariya M. Dalala**, Zahid, Z.U., "New MPPT Algorithm Based on Indirect Open Circuit Voltage and Short Circuit Current Detection for Thermoelectric Generators", *IEEE Proceeding of the Energy Conversion Congress and Exposition (ECCE)*, September 2015.

- Zahid, Z.U., **Zakariya M. Dalala.**, Jih-sheng Lai, “Design and Control of Bidirectional Resonant Converter for Vehicle-to-Grid (V2G) Applications” IEEE IECON2014-40th Annual Conference of the IEEE, 2014.
- Zahid, Z.U.; **Dalala, Z.**; Lai, J.-S.J. “Small Signal Modeling of Series-Series Compensated Induction Power Transfer System”, *Twenty Ninth Annual IEEE Applied Power Electronics Conference and Exposition (APEC), 2014*
- **Zakariya M. Dalala**, Younghoon Cho and Jih-Sheng Lai, “Enhanced Vector Tracking Observer for Rotor Position Estimation for PMSM Drives with Low Resolution Hall-Effect Position Sensors” *IEEE Proceeding of the IEMDC*, May, 2013.
- **Zakariya M. Dalala**, Zaka Ullah Zahid and Jih-Sheng Lai, “New Overall Control Strategy for Wind Energy Conversion Systems in MPPT and Stall Regions”, *IEEE Proceeding of the Energy Conversion Congress and Exposition (ECCE)*, September 2013.
- Atieh, A.; Mansour, I.; **Dalala, Z.**, “Novel Multilayer Structure Demultiplexer in Silica” *Communications and Photonics Conference and Exhibition*, 2011. ACP. Asia.

Professional and Technical Service:

Scientific Reviewer for:

- IEEE Transactions on Power Electronics.
- IEEE Transactions on Energy Conversion.
- IEEE Transactions on Industrial Electronics.
- IEEE Transactions on Industrial Applications.
- IEEE Transaction on Sustainable Energy.
- International Transactions on Electrical Energy Systems.
- IEEE Energy Conversion Congress and Expositions (ECCE).
- IEEE Applied Power Electronics Conference (APEC).
- IEEE International Electric Machines & Drives Conference (IEMDC).
- Energies, MDPI
- IET Renewable Power Generation
- Electric Power Components and Systems, Taylor & Francis
- Journal of Power Electronics, JPELS
- International Journal of Energy Research, Wiley Online Library

Technical Services:

- Consultation services for 2.1MWp solar PV project including tenders’ specifications preparation, evaluation and project supervision and commissioning at the German Jordanian University Campus.
- Consultation services for 465 kWp solar PV project including tenders’ specifications preparation, evaluation and project supervision and commissioning for the Maan Development Area, Maan, Jordan.

- Tenders specifications preparation, evaluation and tender grant for the 6 MWp solar PV project at the Synchrotron-light for Experimental Science and Applications in the Middle East (SESAME) campus
- Evaluation committee member, Khalil Al Salem Award for Best Invention in Renewable Energy, Philadelphia University, 2017, 2019.
- Evaluation committee member, Arab Researcher Award, Abdul Hameed Shoman Foundation, 2018.

Achievements, Honors and Awards:

- Listed amongst the “World’s Top 2% Scientists” featured by Stanford university for the year 2020.
- Undergraduate Degree Fellowship, Jordan University of Science and Technology, Jordan, 2000-2005.
- Ph.D. Scholarship, Ministry of Higher Education, Jordan, 2009-2013.
- Graduate Research Assistantship, ECE Department, Virginia Tech, USA, 2010-2013.
- Best Paper Award, IEEE Energy Conversion Congress and Exposition (ECCE), Sept. 2013.

Professional Associations Membership:

- Jordan Engineers Association
- Institute of Electrical and Electronics Engineers (IEEE)