Mohammad Qasem

Dallas, Texas

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Career Objective

An enthusiastic and highly motivated Ph.D. candidate specializing in battery modeling, aging models, and state estimation algorithms. Seeking to leverage my expertise in lithium-ion battery technology, optimization techniques, and battery management system design to contribute to cutting-edge advancements in energy storage solutions.

Education

Southern Methodist University (SMU) **Aug. 2024 – Present**

PhD in Electrical Engineering (Transferred from IIT), GPA:4/4 *Dallas, TX*

Areas of interest: Real-time Battery Modeling, Fast-charging control, Battery Management System Design, Aging Models, Digital Twin, AI for Battery Health Estimation, Cell and Pack Testing

Illinois Institute of Technology (IIT) **Jan. 2023 – Aug. 2024**

PhD in Electrical Engineering (Transferred to SMU), GPA:4/4 *Chicago, IL*

Areas of interest: Battery Modeling, SoC and SoH Estimation, Lithium-ion Cell and Pack Testing.

Princess Sumaya University for Technology (PSUT) **Feb. 2020 – Jan. 2023**

Msc. Electrical Engineering, GPA:93.1/100 *Amman, Jordan*

Areas of interest: Power Plants Modelling, Meta-heuristic Optimization Technique, Control System Design, Power Electronics, Renewable Energy.
Awards: Ranked 1st of my class.

Al-Balqa' Applied University (BAU) **Sept. 2015 – June 2019**

BSc. Electrical Power Engineering, GPA: 3.38/4.00 *Amman, Jordan*

selected courses: Power Systems, Power Electronics, HV Systems, Power System Protection, Operation and Control
Awards: Ranked 2nd of my class.

Work Experience

Southern Methodist University **Aug. 2024 – Present**

Research Assistant *Dallas, TX*

- Developing real-time electrochemical battery models for fast charging.
- Implementing Digital Twin and AI-based battery health estimation.
- Designing Battery Management System (BMS) for enhanced durability.

Gamma Technologies Inc **June. 2024 – Aug. 2024**

Battery Application Engineer - Intern *Westmont, IL*

- Developed a Battery Power Limit Controller to optimize charging profiles.
- Implemented SoC and SoH estimation algorithms for lithium-ion batteries.
- Designed and validated cell balancing and monitoring systems.

Illinois Institute of Technology **Jan. 2023 – July 2024**

Research Assistant *Chicago, IL*

- Conducted research on battery modeling and state estimation algorithms.
- Conducted comprehensive lithium-ion cell/pack testing.
- Designed charging controller for batteries.
- Designed custom Printed Circuit Boards (PCBs) for battery testing and experimental validation of BMS algorithms.

Teaching Assistant

- Power Electronics Laboratory.
- Hybrid Electric Vehicle Drives Laboratory.

Princess Sumaya University for Technology **Sep 2021 – Jan 2023**

Laboratory Supervisor and Instructor *Amman, Jordan*

- Power electronics laboratory instructor, teaching the different AC-DC, DC-DC, and DC-AC converters.
- Electric machine laboratory instructor, teaching the transformers and the operation and construction of the different electric machines.
- Renewable energy laboratory instructor, designing ON-grid and OFF-grid PV systems, teaching the different types of batteries (Lead-acid, Li-ion) in PV systems, and introducing Wind Turbine systems.

Princess Sumaya University for Technology **Feb 2020 – Sep 2021**

Teaching Assistant *Amman, Jordan*

- Renewable Energy Systems.
- Digital Electronics.
- Power Electronics.
- Power System Analysis.
- Electric Machines.

Golden Energy For Engineering Service. **May 2022 – July 2022**

Technical Design Engineer *Amman, Jordan*

- Designing and Sizing Solar PV Systems.
- Designing and Sizing Mechanical works especially HVAC, Heat Under Flow (HUF), and Radiator for many projects.
- Solar Radiation Measurement and Evaluation.
- Create 3D drawings for the projects using Sketch-up.

Electric Distribution Company EDCO **Dec 2018 – May 2019**

Trainee *Amman, Jordan*

- Design and build electric control panels for hospitals, industries, and homes.
- Motors and Inverters operation and maintenance.

Projects

Design of an Intelligent Sliding Pressure Control for a SCPP using Optimization Techniques. **Nov 2022**

- Developed an intelligent sliding pressure control system for a supercritical power plant using meta-heuristic optimization techniques, improving response time and system efficiency. Implemented and validated the model using MATLAB/Simulink.

Large Scale Integration PV Solar System with Jordanian Grid **June 2019**

- Case study on the Jordanian grid after integrating a large-scale 300MW PV solar plant.

Courses Projects

- **Course:** Power Electronics and Electrich Machines
  - Full Wave Inverter with LC Filter.
  - 3D Printer with CNC Machine.
  - Adaptive Cruise Control (ACC).
  - Tachometer design and motor speed control using Arduino.
- **Course:** Embedded System Design
  - Smart Firefighter Robot Using HCS12 and Arduino.
- **Course:** Renewable Energy Systems
  - Home Automation with Solar Panel System using MCU Node.
  - Solar Panel Tracker Using PIC Micro-controller.

Technical Skills

Programming: MATLAB/Simulink, GT Suite, Python, Altium Designer, PSIM, Pspice, MS-Office, C++, ETAP
CAD Software: Sketch-up, AutoCAD, PV System, ThinkerCAD.
Languages: Fluent in Arabic and very good in English.

Publications

- **M. Qasem** et al., "Evaluate Fast-Charing Stability of Commercial NMC811/Graphite Li-ion Battery through Pulsating Techniques," 2025 IEEE Transportation Electrification Conference and Expo (ITEC) (Accepted)
- M. Haddadin, **M. Qasem**, Y. Yassin, S. Al-Hallaj, and M. Krishnamurthy, "Feasibility Analysis of Utilizing Second-Life eVTOL Batteries in Off-grid EV Charging Stations," 2025 IEEE Transportation Electrification Conference and Expo (ITEC) (Accepted)
- Y. Yassin, M. Haddadin, **M. Qasem**, S. Al-Hallaj, and M. Krishnamurthy, "Pulsed Preheating of High-Power and High-Energy Lithium-Ion Cells in Extreme Cold Temperature," 2025 IEEE Transportation Electrification Conference and Expo (ITEC) (Accepted)
- **M. Qasem** et al., "Dynamic Fast-Charging Control with Age-Aware BMS for Enhanced Stability and Efficiency in Li-ion Batteries," IEEE Open Journal of the Industrial Electronics Society. (Submitted)
- **M. Qasem** et al., "Real-Time Electrochemical Model-Based BMS Control for Mitigating Li-Plating and Extending Battery Life," in IEEE Transactions on Transportation Electrification, doi: 10.1109/TTE.2025.3527899
- **M. Qasem** et al., "Synthetic Data-Integrated Li-ion Battery Modeling for eVTOL Energy Systems," IEEE Access, vol. 12, pp. 76329–76343, Jan. 2024.
- **M. Qasem**, O. Mohamed, and Wejdan Abu Elhaija, "Parameter Identification and Sliding Pressure Control of a Supercritical Power Plant Using Whale Optimizer," Sustainability, vol. 14, no. 13, pp. 8039–8039, Jun. 2022.

Awards and Scholarships

- Best Student Paper at ITEC+ 2025 **June, 2025**
- Frederick E. Terman Award in Electrical Engineering at (SMU) **May, 2025**
- Excellence in Research and Innovation Award at (SMU) **May, 2025**
- Dean's Dissertation Fellowship at (SMU) **April, 2025**
- Best Presentation Award for Ph.D Research. **April, 2024**
- Paul McCoy Fellowship at (IIT) **Feb, 2024**
- Beam Global Fellowship at Illinois Institute of Technology (IIT) **Jan, 2023**
- Princess Sumaya University for Technology (PSUT) Graduate Scholarship for top class rank. **Dec, 2019**

Certificates

- **Battery State of Charge Estimation - University of Colorado**
- **Certificate Energy Manager (CEM)**
- **Certificate in RET screen program**
- **Certificate in Advanced Training on "Promoting Renewable Energy Projects"**
- **Certificate in Advanced Training on "Green Financing"**
- **Certificate in Design of Energy Efficient Lighting Systems**
- **Certificate in Applied Photo-voltaic System**
- **Certificate in Fundamentals of Energy Auditing**
- **Circular Economy and Resource Efficient and Cleaner Production Training (RECP)**

References

- **Mahesh Krishnamurthy, Ph.D.**
  Vin and Caren Prothro Department Chair of Electrical & Computer Engineering
  Co-Executive Director of Hart Institute for Technology, Innovation and Entrepreneurship
  Southern Methodist University
  kmahesh@smu.edu

- **Said Al-Hallaj, Ph.D.**
  Chief Battery Scientist
  CEO of AllCell Technologies LLC
  Beam Global
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- **Wejdan Abu-Elhija, Ph.D.**
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