Mariana Haddadin

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Career Objective

Ph.D. student in Electrical Engineering with a strong academic and professional background in battery systems, machine learning, and sustainable energy technologies. I aim to advance research in intelligent energy storage systems, with a particular focus on second-life lithium-ion batteries, battery aging models, and AI-driven battery management systems. Through cross-functional collaboration and data-driven innovation, I seek to contribute impactful solutions to the evolving challenges in energy systems and to pursue a long-term career in research and development within academia or industry.

Education

Southern Methodist University **Sep. 2024 – Present**
PhD in Electrical Engineering *Dallas, TX*
Areas of interest: Second-life Battery, Machine Learning in Battery Modeling, Digital twins, Aging Models, Cell and Pack Testing

Illinois Institute of Technology **Jan. 2024 – Aug. 2024**
PhD in Electrical Engineering *Chicago, IL*
Areas of interest: Cell and Pack Testing, Aging Models

Princess Sumaya University for Technology **Feb. 2020 – Jan. 2023**
Msc. Electrical Engineering, GPA:89.2/100 *Amman, Jordan*
Thesis Title: Performance Prediction of a Clean Coal Power Plant via Machine Learning and Deep Learning Techniques.

AL Balqa Applied University **Sept. 2015 – June 2019**
BSc. Electrical Power Engineering, GPA: 3.38/4.00 *Amman, Jordan*
selected courses: Power Systems, Power Electronics, High Voltage Systems, Power System Protection, Operation and Control
Awards: Ranked third of my class.

Research Experience

Southern Methodist University **Sep. 2024 – Present**
Teaching and Research Assistant
Research Areas: Lithium-ion batteries, second-life battery, aging analysis
Teaching Course: Modern Electronics Lab

Illinois Institute of Technology **Jan. 2024 – Aug. 2024**
Research Assistant
Research Areas: Lithium-ion batteries, second-life battery, aging analysis

Al-Hussein Technical University **Jul. 2023 – Oct 2023**
Research Assistant
Research Areas: Power to X, Green Hydrogen, Renewable Energy Systems.

Princess Sumaya University for Technology **Feb. 2020 – April 2022**
Teaching and Research Assistant
Research Areas: Power Plants Modelling and Optimization, Deep Learning, Machine Learning, Power System, Power System Protection, Power Electronics, Advanced Electronics Design, Circuit, Renewable Energy Systems.
Teaching courses: Power Electronic Lab, Instrument and Measurement Lab, Workshop Engineering Lab.

Work Experience

Ministry of Energy and Mineral Resources **Sept. 2022 – Dec 2023**
Sustainable Energy Advisor. *Amman, Jordan*
* Evaluation of Energy Audit Studies and comments for Industrial sector (ISEEP).
* Participated in the preparations of bid documents for the School's project.
* Working in the technical evaluation of PV systems, solar water heaters (SWH), and AC.

* Assisted senior engineers to conduct Research and Studies: SOLE Project, EU GCC Clean Energy Technology, KSP Policy Consultation, Youth-Led Research / World Vision, JICA, RENAC, GIZ.
* Evaluation of Energy Audit Studies and comments for Hotel sectors.
* Field visits to all Jordanian governorates to conduct diagnostic evaluations for project beneficiaries and oversee execution.
* Provide technical assistance and support for the covered projects in JREEEF.
* Support the communication processes with all partners in the program.
* Conducting awareness campaigns for RE and EE programs.
* Evaluating feasibility studies for RE and EE projects for different facilities.

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.
* Preparing Feasibility studies for PV power systems.
* Preparing reports for the efficiency, cost, and safety of the project.
* Create electrical single-line diagrams using computer-aided-design (CAD) software.
* Create 3D drawings for the projects using Sketch-up.
* Run PVsys reports for system predicting estimation.
* Preparing financial proposals for clients.
* Preparing the official and governmental documents need for the company.
* Renewable energy and how it pertains to HVAC design.

Training Experience

Ministry of Energy and Mineral Resources **Nov. 2019 – Jan. 2022**
Sustainable Energy engineering trainee. *Amman, Jordan*

* Monitoring and Evaluating JREEEF's program.
* Provided assistance and support for covered projects by the Ministry of Energy and Mineral Resources (MEMR).
* Training includes Energy Efficiency projects in (Hotels, Factories, and Schools) and Studying the environmental issues related to CO2 emissions.
* Participated in preparing the annual work plan of the JREEEF's programs and projects.
* Participated in the preparation of bid documents for the JREEEF's project and programs.
* Evaluated Photovoltaic projects by local PV companies under MEMR's tenders.

Al Manhal Renewable Energy Company (MEC) **Feb. 2019 – June 2019**
Training in Renewable Energy *Amman, Jordan*

* Participating in the design of PV system and UPS storage.
* Participating in technical proposals evaluation.
* Providing the following sectors with optimal protection for their network power supplies and security systems: banking, government, international NGOs, IT, industrial, health, education, trading, and private sectors.

Projects

Performance Prediction of a Clean Coal Power Plant via Machine Learning and Deep Learning Techniques
* Design a simplified mathematical model that represents the behavior of the coal power plant and implement different machine learning algorithms to predict and improve its performance. **Jan 2023**

Large Scale Integration PV Solar System with Jordanian Grid **June 2019**
* Case study on the Jordanian grid after integrate a large scale of 300MW PV solar panel.

Courses Projects

* **Course:** Power Electronics
  - **Project:** Full Wave Inverter with LC Filter.
* **Course:** Embedded System Design
  - **Project:** Smart Firefighter Robot Using HCS12 and Arduino.
* **Course:** Special Topics in Electrical Engineering
  - **Project:** Solar Panel Tracker Using PIC Micro-controller.

Technical Skills

Programming: MATLAB, Simulink, Python, MS-Office, C++, ETAP
CAD Software: GT software, Sketch-up, AutoCAD, PV System
Languages: English and Arabic

Publications

Journal Papers

* **Haddadin, M.**, Qasem, M., Yassin, Y., Qandil, M., & Krishnamurthy, M. "A Multi-Constraint Framework for End-of-Life Prediction in eVTOL Battery Systems". (In progress) .
* **Qasem, M.**, Haddadin, M., Yassin, Y., Qandil, M., & Krishnamurthy, M. "A Comparative Review of Age-Aware Fast Charging Techniques for Advanced Battery Management Systems". (In progress) .
* **Qasem, M.**, Haddadin, M., Yassin, Y., Ratrout, S., Chen, C., Stoyanov, S., Al-Hallaj, S., & Krishnamurthy, M. (2025). "Real-Time Electrochemical Model-Based BMS Control for Mitigating Li-Plating and Extending Battery Life". IEEE Transactions on Transportation Electrification .
* **Qasem, M.**, Stoyanov, S., Ratrout, S., Haddadin, M., Yassin, Y., Chen, C., Al-Hallaj, S., & Krishnamurthy, M. (2024). "Synthetic Data-Integrated Li-Ion Battery Modeling for eVTOL Energy Systems". IEEE Access.
* **Haddadin, M.** ,Mohamed, O., Abu Elhaija, W., & Matar, M. (2023)., "Performance prediction of a clean coal power plant via machine learning and deep learning techniques.". Energy & Environment, 0(0).

Confrence Papers

* **Haddadin, M.** ,Qasem, M., Yassin, Y., Al-Hallaj, S.,& Krishnamurthy, M. (2025)., "Feasibility Analysis of Utilizing Second-Life eVTOL Batteries in Off-grid EV Charging Stations.". 2025 IEEE Transportation Electrification Conference and Expo (ITEC).
* **Qasem, M.** , Yassin, Y., Haddadin, M., Stoyanov, S., Al-Hallaj, S.,& Krishnamurthy, M. (2025)., "Analyzing Suitability of Pulsating Techniques for Fast-Charging of Commercial NMC811/Graphite Li-Ion Batteries.". 2025 IEEE Transportation Electrification Conference and Expo (ITEC).
* **Yassin, Y.**, Haddadin, M., Qasem, M., Stoyanov, S., Al-Hallaj, S.,& Krishnamurthy, M. (2025)., "Pulsed Preheating of High-Power and High-Energy Lithium-Ion Cells in Extreme Cold Temperature.". 2025 IEEE Transportation Electrification Conference and Expo (ITEC).

Scholarships and Awards

- Best Student Paper Award,2025, IEEE Transportation Electrification Conference and Expo(ITEC), **Analyzing Suitability of Pulsating Techniques for Fast-Charging of Commercial NMC811/Graphite Li-Ion Batteries.**
- Southern Methodist University (SMU) Graduate Scholarship. **Jan,2025**
- Illinois Institute of Technology (IIT) Paul McCoy Fellowship. **Feb,2024**
- Illinois Institute of Technology (IIT) PhD Scholarship Graduate Scholarship for Professionals. **Oct,2023**
- Princess Sumaya University for Technology (PSUT) Graduate Scholarship for Professionals. **Dec,2019**

Certificates

* **Certificate Energy Manager (CEM),AEE**
* **Certified Measurement & Verification Professional (CMVP),AEE**
* **Certificate in RET screen program, CIET**
* **Certificate ISO 50001:2018 Lead Auditor, Bureau Veritas**
* **Certificate in Operating and Maintenance of PV Systems, German Academy in Jordan**
* **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 and Computer Engineering
  Co-Executive Director, Hart Institute for Technology, Innovation and Entrepreneurship
  Illinois Institute of Technology
  mkrishnamurthy@smu.edu

* **Said Al-Hallaj, Ph.D.**
  Chief Battery Scientist
  CEO of AllCell Technologies LLC
  Beam Global
  saidalhallaj@beamforall.com

* **Wejdan Abu-Elhija, Ph.D.**
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