Hussein Sharadga

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Education

Texas A&M University, College Station, Texas | Jan. 2019 – Aug. 2022
Ph.D. in Mechanical Engineering
Advisor: Prof. Bryan Rasmussen

Jordan University of Science & Technology, Irbid, Jordan | Sep. 2015 – July 2017
M.Sc. in Mechanical Engineering
Advisor: Prof. Moh'd Al-Nimr
Al-Balqa' Applied University, Irbid, Jordan | Aug. 2011– June 2015
B.Sc. in Mechanical Engineering

Academic Positions

Current:

Assistant Professor | Aug. 2024 – Present
School of Engineering, Texas A&M University- International

Research Affiliate | Aug. 2024 – Present
University of Texas at Austin

Past:

Postdoc Researcher | Dec. 2022 – Aug. 2024
University of Texas at Austin
Advisor: Prof. Javad Mohammadi

Research Focus

Artificial Intelligence (AI): Machine Learning, Deep Learning
Optimization: Convex/Non-convex, Mixed Integer Programming, Heuristic
Energy: Power Grid, Photovoltaic Technology
Scheduling, Decision-Making under Uncertainty, Stochastic Programming

National Awards

ARPA-E Grid Optimization Competition Challenge 3 Prize Winner | 2023
University of Texas at Austin
Trail 1: ranked 2nd in the total score
Trail 2: ranked 1st
Trail 3: ranked 2nd **|$115,000 prize|** Link

Grant

ERI: Probability-Informed Deep Learning: Introducing Probabilistic-Adversarial Networks for Time Series Forecasting (Pending Review)
PI: **Hussein Sharadga**, Co-PIs: None
Budget: $199,875
Submitted to: NSF

Research Projects

University of Texas at Austin Dec. 2022 - Sep 2023
Postdoc Researcher
- Project: ARPA-E Power Grid Optimization Competition

University of Massachusetts Amherst Sep. 2022 - Dec. 2022
Postdoc Researcher
- Project: Energy Optimization with a Risk-Averse Markov Decision Framework in Uncertain Conditions

Texas A&M University -- College Station Jan. 2019 - June 2022
Research Assistant
- Project A: Solar Photovoltaic Battery Systems -- Optimization & Scheduling (Convex Optimization, Machine Learning, Stochastic Programming)
- Project B: Solar Photovoltaic Systems -- Power Prediction using Machine Learning, Electrical Modeling, and Tracking Control Design
- Project C: AI Applications to Thermal Radiation in Porous Media

Teaching Experiences

Texas A&M International University Aug. 2024 – Present
Assistant Professor
- Teaching courses in Statistics, Eng. Modeling & Design, and Smart Grid Optimization.

University of Texas Permian Basin Sep. 2023 – May 2024
Visiting Assistant Professor
- Instructed undergraduate courses in Intro to Thermodynamic, Thermodynamic II, Fluid Mechanics II, Heat Transfer, Engineering Graphic, Computer-Aided Mechanical Design, Dynamics, Advanced Engineering Analysis, and Thermo-fluid & Mech Sys Lab.
- Student Evaluations Link *(Range: 4.0–4.47, Average: 4.23)*

University of Texas at Austin- Guest Lecturer Jan. 2023 - May 2023
- Course: Energy Systems Operation / Optimization.

Texas A&M University- College Station Sep. 2020 - June 2022
Teaching Assistant
- Assisted in Courses: Mechanical Measurement Lab (MEEN 260), Dynamic System & Control Lab (MEEN 364), and Principles of Building Energy Analysis (MEEN 437).

Binghamton University Aug. 2018 - Dec. 2018
Teaching Assistant
- Course: Thermodynamic (ME 331).

Jordan University of Science & Technology Sep. 2015 - July. 2017
Teaching Assistant
- Courses: Heat Transfer, Fluid Dynamic, Engineering Drawing Lab.

Publications

h-index: 7, Citations: 505
Google Scholar Profile: Google Scholar

Refereed Publications (Published):

1) **Hussein Sharadga**, Javad Mohammadi, Constance Crozier, Kyri Baker "Scalable Solutions for Security-Constrained Optimal Power Flow with Multiple Time Steps", accepted at *IEEE Transactions on Industry Applications* (2024).

2) **Hussein Sharadga**, Javad Mohammadi, Constance Crozier, Kyri Baker "Optimizing Multi-Timestep Security-Constrained Optimal Power Flow for Large Power Grids", *IEEE Texas Power and Energy Conference* (2024).

3) Ahmad Dawahdeh*, **Hussein Sharadga*** **"**A Novel Augmented MPPT Controller for Photovoltaic Systems under Rapid Solar Radiation Changes Using Neural Network", *Sustainability* (2024).

4) Shima Hajimirza, **Hussein Sharadga**, "Learning Thermal Radiative Properties of Porous Media from Engineered Geometric Features", *Int. J. Heat Mass Transf* (2021).

5) **Hussein Sharadga**, Shima Hajimirza, Elmer PT Cari, "A Fast and Accurate Single-Diode Model for Photovoltaic Design", *IEEE*, (2020).

6) **Hussein Sharadga**, Shima Hajimirza, Robert S Balog, "Time Series Forecasting of Solar Power Generation for Large-Scale Photovoltaic Plants", *Renewable Energy* (2020).

7) AliAkbar Shafi, **Hussein Sharadga**, Shima Hajimirza, "Design of Optimal Power Point Tracking Controller Using Forecasted Photovoltaic Power and Demand", *IEEE Transactions on Sustainable Energy* (2019).

8) **Hussein Sharadga,** Ahmad Dawahdeh, Moh'd A Al-Nimr "A hybrid PV/T and Kalina Cycle for Power Generation", *Int J Energy Res* (2018).

9) Moh'd A Al-Nimr, Suhil Kiwan, **Hussein Sharadga**, "Simulation of a Novel Hybrid Solar Photovoltaic/Wind System to Maintain the Cell Surface Temperature and to Generate Electricity", *Int J Energy Res* (2018).

10) Moh'd A Al-Nimr, Suhil Kiwan, **Hussein Sharadga**, "A Hybrid TEGs/Wind System Using Concentrated Solar Energy and Chimney Effect", *Int J Energy Res* (2018).

Publications (Under Review):

11) Maureen S Golan, **Hussein Sharadga**, Javad Mohammadi "Power Grid Resilience: Insights from Sensitivity Analysis and Scenario Simulation Using the Grid Optimization Platform", *Environment Systems and Decisions Journal*, (2024).

12) **Hussein Sharadga**, Golbon Zakeri, "Scheduling Battery Systems Under Load Uncertainty Using Markov Decision Process", *Energies Journal*, (2024).

Publications (Draft in Progress):

13) **Hussein Sharadga**, Abdullah Hayajneh "Comparative Analysis of AI Image Inpainting Methods: Mask-Aware Transformers, Large Mask Inpainting, GAN-Enhanced Techniques, Diffusion-Based Approaches, and Beyond", (2024).

14) **Hussein Sharadga**, Bryan Rasmussen "Demand Peak Shaving Using PV-Battery Systems under PV Power and Load Prediction Uncertainty", (2022).

* Authors contributed equally to this work

15) **Hussein Sharadga**, Bryan Rasmussen "Evaluation of Simple Forecasting Tools for Demand Peak Shaving Compared to Sophisticated Prediction Algorithms", (2022).

16) **Hussein Sharadga**, Bryan Rasmussen "Sizing PV-Battery Grid-Connected Systems Utilizing the Convex Optimization Algorithm for Peak Shaving Application", (2022).

Mentored Students

Maureen S Golan, Ph.D. Student, 2023, The University of Texas at Austin.
Arash Khojaste, Ph.D. Student, 2022, University of Massachusetts Amherst.

Invited Co-Speaker

Javad Mohammadi, **Hussein Sharadga**, 'Electric-Stampede's Approach: Fast and Robust Strategies for Large-scale mixed-integer SCOPF', presented at the ARPA-E Grid Software Annual Review, 2023 Annual Meeting, https://gocompetition.energy.gov/news.

Poster Presentations

1) **Hussein Sharadga**, Javad Mohammadi, "Electric Stampede: A Robust Solution to The Challenging Task of Us Power Grid Optimization," INFORMS Annual Meeting, Phoenix (2023).

2) **Hussein Sharadga**, Shima Hajimirza, "Time Series Forecasting of Solar Power Generation for Large-Scale Photovoltaic Plants", Texas A&M Conference on Energy (2019).

3) Mine Kaya, **Hussein Sharadga**, Shima Hajimirza, "A Fast and Accurate Single Diode Model for Photovoltaic Design," IMECE, Utah (2019).

Code Repository

1) **Hussein Sharadga**, Golbon Zakeri, "Scheduling Battery Systems Under Uncertainty Using Markov Decision Process", (2023). Available at: https://github.com/hssharadga/Markov-Decision-for-Battery-Scheduling.

2) **Hussein Sharadga**, Bryan Rasmussen, "Sizing and Scheduling Solar Photovoltaic-Battery System using Convex Optimization, Machine Learning, and Stochastic Programming", (2022). Available at: https://github.com/hssharadga/Sizing-and-Scheduling-PV-Battery.

3) **Hussein Sharadga**, "Application of Artificial Intelligence for Thermal Radiation in Porous Media", (2020). Available (draft) at: https://github.com/hssharadga/Porous-Media-Paper.

Programming Expertise

Coding Languages: Python, MATLAB, Julia, C/C++.

AI Python Libraries: Keras, Pytorch, Scikit-learn.

Optimization Solvers: Gurobi, Mosek, IPOPT.

University Service

ABET Committee Member
University of Texas Permian Basin| Fall 2023
Supported accreditation efforts and curriculum evaluation.

Search Committee Member
Texas A&M International University| Fall 2024
Assisted in faculty recruitment and selection.

Last updated as of Nov. 8, 2024