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Dr. Muhammad Khalid

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Executive Summary:

Over ten years of experience in renewable energy and storage systems. Developed many innovative operational algorithms for battery energy storage systems (BESSs) particularly monotonic charging/discharging of BESSs coupled with predictive optimization and advanced control theory. Actively working on academic and industrial projects in the field of distributed energy resources and micro-grids, optimal energy storage sizing, advanced and intelligent control algorithms, energy system scheduling, energy storage selection, hydrogen systems, power quality, and optimal utilization of energy storage systems (and hybrid storage technologies) for reliable, sustainable, and economic integration of renewables with a particular focus on grid resilience and flexibility in the paradigm of future smart-grids. Developing research proposals, and consequently prototypes on fundamental and applied multidisciplinary fields clearly aligned with Saudi Vision 2030 and in collaboration with internal, local, and international collaborations. Building human capacity in terms of supervising undergraduate, master, Ph.D. students, and Postdocs. Finally, exploring and applying innovative strategies in University teaching like IBL and OBE. Involved in many administrative activities of the electrical engineering department and the University at large.

Education:

- Ph.D. Electrical Engineering [The University of New South Wales (UNSW), Sydney, Australia, 2011]

Distinguished Projects

- Solar Flagship Project, Australian Energy Research Institute (renamed as "UNSW Energy Institute", Sydney) UNSW-UQ, Australia, 2012.
- "Development and Control of Hybrid Battery-Supercapacitor Energy Storage System for Solar Power Applications", Deanship of Research (DSR), KFUPM, 2016-2017.
- "Integrating AGC to Generation Scheduling", DSR, KFUPM, 2017-2020.
- "Design and Control of Battery Energy Storage System for Microgrids" DSR, KFUPM, 2017-2019.
- "Integrated Energy Management System for Microgrids with Renewable Generation, Storage and Controllable Load Resources", DSR, KFUPM, 2017-2020.
- "Design and Development of an Optimal Distributed Generation and Hybrid Storage System for Microgrids", DSR, KFUPM, 2018-2020.
- "Advanced Controller Design for Solar Energy Management", DSR, KFUPM, 2018-2020.
- "Controller Design and Implementation Solar PV Converters", DSR, KFUPM, 2018-2020.
- "Solar Power Dispatch Using Control and Optimization Technique", DSR, KFUPM, 2020-2021.
- "Development of an Intelligent Power Quality and Stability Framework for Large-Scale Integration of Renewable Energy Sources", DSR, KFUPM, 2020-2022.
- "Development of Robust Integrated Controller for Optimal Power Management in Renewable Microgrids" IRC: Center for Renewable Energy and Power Systems, KFUPM, 2021-2023.
- "Frequency Control and Inertia Support for Solar PV Plants Using Integrated Hybrid Energy Storage Systems", DSR, KFUPM, 2021-2023.

Research Summary

- Number of Published Papers: 129
- Citations : ~2000
- H-Index : 22
- Number of Patents (filed) : 12
- Book Chapters: 5
- Article Reviewed (Elsevier, IEEE, MDPI): 50+

Award and Recognitions

- Listed in World's ranking of top 2% scientists in 2021 – Stanford University Study (Elsevier Scopus).
- Best Research Project Award, KFUPM, 2019-2020.
- Best Academic Advising Award in Faculty of Engineering, KFUPM, 2019-2020.
- Second Place Winner in 8th Undergraduate Research Competition (URC'21), Abu Dhabi, 2021.
- Best Poster Award in the 8th International Conference on Renewable Energy Research and Applications, Romania.
- IEEE PES Student Travel Grant Award in 27th International Symposium on Industrial Electronics, Australia.
- Guest Editor MDPI , Sustainability , Impact Factor: 3.251, Ranking Q2.
- Postgraduate Research Student Support (PRSS) Travel Grant: School of Electrical Engineering & Telecommunications (EE&T), UNSW, Sydney, 2009.
- Postgraduate Research Student Support (PRSS) Travel Grant, EE&T, UNSW, Sydney, 2010.
- Postdoctoral Writing Fellowship Award, EE&T, UNSW, Sydney, 2010.
- University International Post Graduate Award (UIPA), EE&T, UNSW, Sydney, Australia.

Skills and Expertise

- Design, optimization, and control of renewable energy systems.
- Wind and solar power forecasting and dispatch.
- Modelling of energy storage systems.
- Power system planning and operation.
- Grid Integration of renewable energy resources.
- Microgrid and smart grids.
- Intelligent systems and machine learning.