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Dr. Shafiqur Rehman

Research Engineer/ Associate Professor

Interdisciplinary Research Center for Renewable Energy and Power Systems (IRC-REPS)
King Fahd University of Petroleum & Minerals, Saudi Arabia

Executive Summary

Shafiqur Rehman is a Mechanical Engineer with over 20 years of experience on meteorology, resources assessment, measurement campaign, data collection and analysis, potential site identification, wind farm and solar photovoltaic farm sizing, hybrid power system design and optimization, etc. Specifically, some of the highlights related to his work are as follows:

- ✓ **Wind Power Resource Assessment**: Analyzed historical meteorological data to identify the potential sites on national level for wind and solar resources. Compiled the geothermal resources information for the Kingdom.
- ✓ **Measurements**: Conducted Wind speed measurement at different heights by installing wind masts at several locations and LiDAR wind profiler for actual wind resource assessment.
- ✓ **Prediction Research**: Introduced Artificial Neural Networks for the prediction and estimation of wind speed and solar radian in time and spatial domains.

Education

- ❑ PhD Mechanical Engineering (University of Pretoria, South Africa, 2012)
- ❑ MS Mechanical Engineering (KFUPM, 1985)
- ❑ BSc (Honors) Physics

Distinguished Projects

- Solar cooling for Dairy Farms (CER2469), GreenAire, Dammam, Saudi Arabia
- Wind Energy for Remote Villages (PN – CER2252 and CER2298) - Phase I and II, Saudi Electricity Company, Riyadh
- Study of Grid Connected Wind Farm (PN – CER2251 and CER2297) – Phase I and II, Saudi Electricity Company, Riyadh
- Energy harvesting from ocean current: a bio-inspired technique, Deanship of Research, KFUPM, DF191002
- Performance Analysis of Vertical Axis Wind Turbine under Non Uniform Wind Conditions, Deanship of Research, DF191058, KFUPM
- Improving Efficiency of Solar PV Panels using a DRONE, Deanship of Research. DF191024, KFUPM
- GIS-based site suitability analysis for wind farm development in Saudi Arabia, Deanship of Scientific Research, KFUPM, SB181005
- Selection of Wind Turbines for Potential Wind Farm Sites in Northern and Eastern Regions of Saudi Arabia using Artificial Intelligence Augmented Decision-making Techniques, DSR, KFUPM, SB181015
- Improvements of cut-in Speed and Aerodynamic Performance of Wind Turbine Blades, IN151026, DSR, KFUPM
- Application of Multi-Criteria Decision-Making Techniques to Selection of Wind Turbines – A study of three potential sites in Saudi Arabia, IN141039, DSR, KFUPM
- National Inventory of anthropogenic emissions by sources and removal by sinks of greenhouse gases for the Kingdom of Saudi Arabia, CEW02427, Saudi Aramco
- Improving the load curve in Saudi Arabia by building pumped storage power plant, CER02371, MOWE, Riyadh
- Development of a Web-Based National Corrosion Inventory System (NCIS), AT 97-29, KACST, Riyadh

Research Summary

- ➢ Projects and Quotations = 49 and Reports =112
- ➢ Technical Memorandum = 20 and Proposals =45
- ➢ Number of Published Papers = 283
- ➢ Conference Presentations = 26
- ➢ Citations = 7,799 and H-Index = 42
- ➢ Number of Patents = 04
- ➢ Books = 1 and Book Chapters = 07
- ➢ PhD = 1 and MS = 2 Thesis

Award and Recognitions

- ➢ Made to Stanford top 2% Worldwide Researchers List – 2021
- ➢ Almarai Scientific Innovation Award-2017
- ➢ Excellence in Applied Research Award 2012 and 2006, KFUPM
- ➢ Best Paper Awards (CSIRO-2013) and 2014
- ➢ Visiting Professor 2014, 2017, and 2018 HIT, China

Skills and Expertise

- ➢ Renewable energy resources assessment (wind and solar)
- ➢ Meteorological data measurements using wind masts of up to 100 m high and LiDARS
- ➢ Wind speed and solar radiation prediction both in spatial and time domains
- ➢ Hybrid power systems design and optimization
- ➢ Hands on experience on Windographer, Grapher, HOMER, RetScreen, and others
- ➢ Teaching, senior projects supervision, CO-OP student project, MS and PhD thesis, part time MS and PhD student's mentoring, etc.