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| Title | Hourly Forecasting of Solar Photovoltaic Power in Pakistan Using Recurrent Neural Networks | | |
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| Abstract |  |
| The solar photovoltaic (PV) power forecast is crucial for steady grid operation, scheduling, and grid electricity management. In this work, numerous time series forecast methodologies, including the statistical and artificial intelligence-based methods, are studied and compared fastidiously to forecast PV electricity. Moreover, the impact of different environmental conditions for all of the algorithms is investigated. Hourly solar PV power forecasting is done to confirm the effectiveness of various models. Data used in this paper is of one entire year and is acquired from a 100MW solar power plant, namely, Quaid-e-Azam Solar  Park, Bahawalpur, Pakistan. This paper suggests recurrent neural networks (RNNs) as the best-performing forecasting model for PV power output. Furthermore, the bidirectional long-short-term memory RNN framework delivered high accuracy results in all weather conditions, especially under cloudy weather conditions where root mean square error (RMSE) was found lowest 0.0025, *R* square stands at 0.99, and coefficient of variation of root mean square error (RMSE) Cv was observed 0.0095%. | |