

Stochastic Analysis and Synthetic Data Generation of Renewable Energy Resources

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The production of renewable energy is increasing enormously recently. A hybrid renewable energy system (HRES) consists of power generator using renewable energy, energy storage system (ESS), inverter, etc. to provide increased the power system efficiency as well as greater balance in renewable energy supply. Synthetic data generation, which reproduces important statistical features of the real renewable energy resource data, is essential for the design of the hybrid renewable energy system. The objective of this research is generation of the synthetic data with stochastic analysis of renewable energy resources, and the research targets solar radiation and wind as the sources of renewable energy. Using publicly available renewable energy time series data, a stochastic model is developed to have the same statistical properties and synthetic data is generated using the model.