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Editorial

Data Science and Big Data in Energy Forecasting

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Abstract: This editorial summarizes the performance of the special issue entitled *Data Science and Big Data in Energy Forecasting*, which was published at MDPI's Energies journal. The special issue took place in 2017 and accepted a total of 13 papers from 7 different countries. Electrical, solar and wind energy forecasting were the most analyzed topics, introducing new methods with applications of utmost relevance.

Keywords: energy; time series; forecasting; data mining; big data

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This special issue has focused on the forecasting of time series with data mining and big data techniques, paying particular attention to energy related data. Energy was understood to be of any kind, such as electrical, solar and wind.

Authors were invited to submit their original research and review articles on exploring the issues and applications of energy time series and forecasting.

Topics of primary interest included, but were not limited to:

(1) Energy-related time series analysis;
(2) Energy-related time series model;
(3) Energy-related time series forecasting;
(4) Non-parametric time series approaches.

From all the submissions received, only those with very high quality scientific content and clear contributions to the state of the field were accepted, after rigorous peer review. A total of thirteen papers were accepted, with the following author's geographical distribution:

(1) Spain (5);
(2) China (2);
(3) Taiwan (2);
(4) Canada (1);
(5) Poland (1);
(6) Chile (1);
(7) France (1).

The submissions received can be broadly divided into the following topics. First, electricity demand forecasting has been addressed by using deep learning [1], ensemble learning [2] and the functional state space model [3]. Analogously, data from the UK and Canada were analyzed in [4], generating accurate forecasts. Unsupervised techniques have also been used to discover relevant patterns within consumption time series. In particular, data from a Spanish public university were analyzed in [5] in order to discover load profiles and reduce costs. Similar strategies were applied to determine whether Polish customers choose proper tariffs or not in [6].

Two key aspects in wind energy have been studied in this special issue: Wind speed and wind power generation. On the one hand, a hybrid wind speed forecasting system based on a decomposition and ensemble strategy and fuzzy time series can be found in [7]. One the other hand, wind power forecasting based on echo state networks and long short-term memory was analyzed in [8]. Three more papers studied wind turbines from a temporal point of view. In particular, a reduced order model to predict transient flows around straight bladed vertical axis wind turbines was proposed in [9]. Moreover, self organizing maps and interpretation-oriented post-processing tools were used to identify the health status of wind turbines [10]. Last, a new method to predict the wind velocity upstream of a horizontal axis wind turbine from a set of light detection and ranging (LiDAR) measurements was introduced in [11].

Another interesting manuscript was published in the field of solar energy; predictions of surface solar radiation on tilted solar panels using machine learning models were reported in [12], using data from Taiwan as a case study. Also in Taiwan's Northeastern Coast, nearshore wave was predicted by means of data mining techniques during typhoons [13].

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