



Contribution ID: 57

Type: **not specified**

Textual Data for Time Series Forecasting

Tuesday, June 28, 2022 3:10 PM (30 minutes)

Traditional mid-term electricity forecasting models rely on calendar and meteorological information such as temperature and wind speed to achieve high performance. However depending on such variables has drawbacks, as they may not be informative enough during extreme weather. While ubiquitous, textual sources of information are hardly included in prediction algorithms for time series, despite the relevant information they may contain. In this work, we propose to leverage openly accessible weather reports for electricity demand and meteorological time series prediction problems. Our experiments on French and British load data show that the considered textual sources allow to improve overall accuracy of the reference model, particularly during extreme weather events such as storms or abnormal temperatures. Additionally we apply our approach to the problem of imputation of missing values in meteorological time series, and we show that our text-based approach beats standard methods. Furthermore, the influence of words on the time series' predictions can be interpreted for the considered encoding schemes of the text, leading to a greater confidence in our results.

Keywords

Time series, Forecasting, Electricity consumption

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Session Classification: INVITED SFdS

Track Classification: Other/special session/invited session