Abstract

Forecasting electric load accurately is a critical prerequisite to dependable power grid operation. It is thus in the best interests of the responsible institutions to develop and maintain performant models for predicting load. In this thesis, we analyze Czech electric load data and execute three pseudo-out-of-sample forecasting exercises. We employ standard econometric as well as machine learning methods and compare the results to benchmarks, including the predictions published by the Czech transmission system operator. The results of the first task examining the predictability of minute loads using 11 years of data indicate that the high-frequency load series is predictable. In the second and third exercises, we utilize hourly loads with additional explanatory variables. We generate one-step-ahead and 48-hours-ahead forecasts on the 2021 out-of-sample set and evaluate the performance of several methods. In both exercises, the most accurate results are produced by averaging forecasts of our specified recurrent neural network and the seasonal autoregressive integrated moving average model, achieving a mean absolute percentage error of less than 0.5% on the out-of-sample set in the one-step-ahead analysis and 2.3% in the 48-hours-ahead exercise, outperforming the operator's predictions.