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Online Hierarchical Forecasting for Power Consumption Data

Tuesday, 14 September 2021 17:05 (20 minutes)

We propose a three-step approach to forecasting time series of electricity consumption at different levels of household aggregation. These series are linked by hierarchical constraints -global consumption is the sum of regional consumption, for example. First, benchmark forecasts are generated for all series using generalized additive models; second, for each series, the aggregation algorithm 'ML-Poly', introduced by Gaillard, Stoltz and van Erven in 2014, finds an optimal linear combination of the benchmarks; Finally, the forecasts are projected onto a coherent subspace to ensure that the final forecasts satisfy the hierarchical constraints. By minimizing a regret criterion, we show that the aggregation and projection steps improve the root mean square error of the forecasts. Our approach is tested on household electricity consumption data; experimental results suggest that successive aggregation and projection steps improve the benchmark forecasts at different levels of household aggregation.results suggest that successive aggregation and projection steps improve the benchmark forecasts at different levels of household aggregation. Results suggest that successive aggregation and projection steps improve the benchmark forecasts at different levels of household aggregation.

Keywords

Electrical demand forcasting, Time series, Forecast combination, Hierarchical forcasting

Special/invited session

SFDS

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