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Autore	Antoniadis Anestis
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Altri autori (Persone)	CugliariJairo FasioloMatteo GoudeYannig PoggiJean-Michel
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Nota di contenuto	Introduction -- Part I: A Toolbox of Models -- Additive Modelling of Electricity Demand with mgcv -- Probabilistic GAMs: Beyond Mean Modelling -- Functional Time Series -- Random Forests -- Aggregation of Experts -- Mixed Effects Models for Electricity Load Forecasting -- Part II: Case Studies: Models in Action on Specific Applications -- Disaggregated Forecasting of the Total Consumption -- Aggregation of Multi-Scale Experts -- Short-Term Load Forecasting using Fine-Grained Data -- Functional State Space Models -- Forecasting Daily Peak Demand using GAMs -- Forecasting During the Lockdown Period.

This monograph explores a set of statistical and machine learning tools that can be effectively utilized for applied data analysis in the context of electricity load forecasting. Drawing on their substantial research and experience with forecasting electricity demand in industrial settings, the authors guide readers through several modern forecasting methods and tools from both industrial and applied perspectives – generalized additive models (GAMs), probabilistic GAMs, functional time series and wavelets, random forests, aggregation of experts, and mixed effects models. A collection of case studies based on sizable high-resolution datasets, together with relevant R packages, then illustrate the implementation of these techniques. Five real datasets at three different levels of aggregation (nation-wide, region-wide, or individual) from four different countries (UK, France, Ireland, and the USA) are utilized to study five problems: short-term point-wise forecasting, selection of relevant variables for prediction, construction of prediction bands, peak demand prediction, and use of individual consumer data. This text is intended for practitioners, researchers, and post-graduate students working on electricity load forecasting; it may also be of interest to applied academics or scientists wanting to learn about cutting-edge forecasting tools for application in other areas. Readers are assumed to be familiar with standard statistical concepts such as random variables, probability density functions, and expected values, and to possess some minimal modeling experience.

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