

*Application of Semiparametric Modelling to Times Series Forecasting
Case of the Electricity Consumption*

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Abstract

Réseau de Transport d'Electricité (RTE), in charge of operating the French electric transportation grid, needs an accurate forecast of the power consumption in order to operate it correctly. The forecasts used everyday result from a model combining a nonlinear parametric regression and a SARIMA model. In order to obtain an adaptive forecasting model, nonparametric forecasting methods have already been tested without real success. In particular, it is well known that a non-parametric predictor behaves badly with a great number of explanatory variables, what is commonly called the curse of dimensionality. Recently, semi-parametric methods which improve the pure non-parametric approach have been proposed to estimate a regression function. Based on the concept of 'index', one of those methods (called MAVE : Moving Average conditional- Variance Estimate) can apply to time series. We study empirically its effectiveness to forecast the future values of an autoregressive time series. We then adapt this method, from a practical point of view, to forecast power consumption. We propose a semi-linear and semi-parametric model, partially based on the MAVE method, which allows to take into account simultaneously the autoregressive aspect of the problem and the exogenous variables.