Nonparametric Functional Data Analysis
Chapters 12
Application to Continuous Time Processes
Prediction

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Towards Functional Approach to Time Series Prediction

Given a time series $\{Z_t, t \in \mathbb{R}\}$

- The non-functional version

$$\mathbf{X}_i = (Z_{i-p+1}, \ldots, Z_i) \text{ and } Y_i = Z_{i+s},\ i = p, \ldots, N-s$$

- The functional version

$$\boldsymbol{\chi}_i = \{Z(t), (i-1)\tau < t \leq i\tau\} \text{ and } Y_i = Z(i\tau+s),\ i = 1, \ldots, n-1$$

Example: Forecasting Electricity Consumption

- Monthly records of 28 years.
- The task is to predict the 28th year by the data from the 27 previous ones.
- That is, 26 traning samples of 12 dimensions.

Example: Forecasting Electricity Consumption

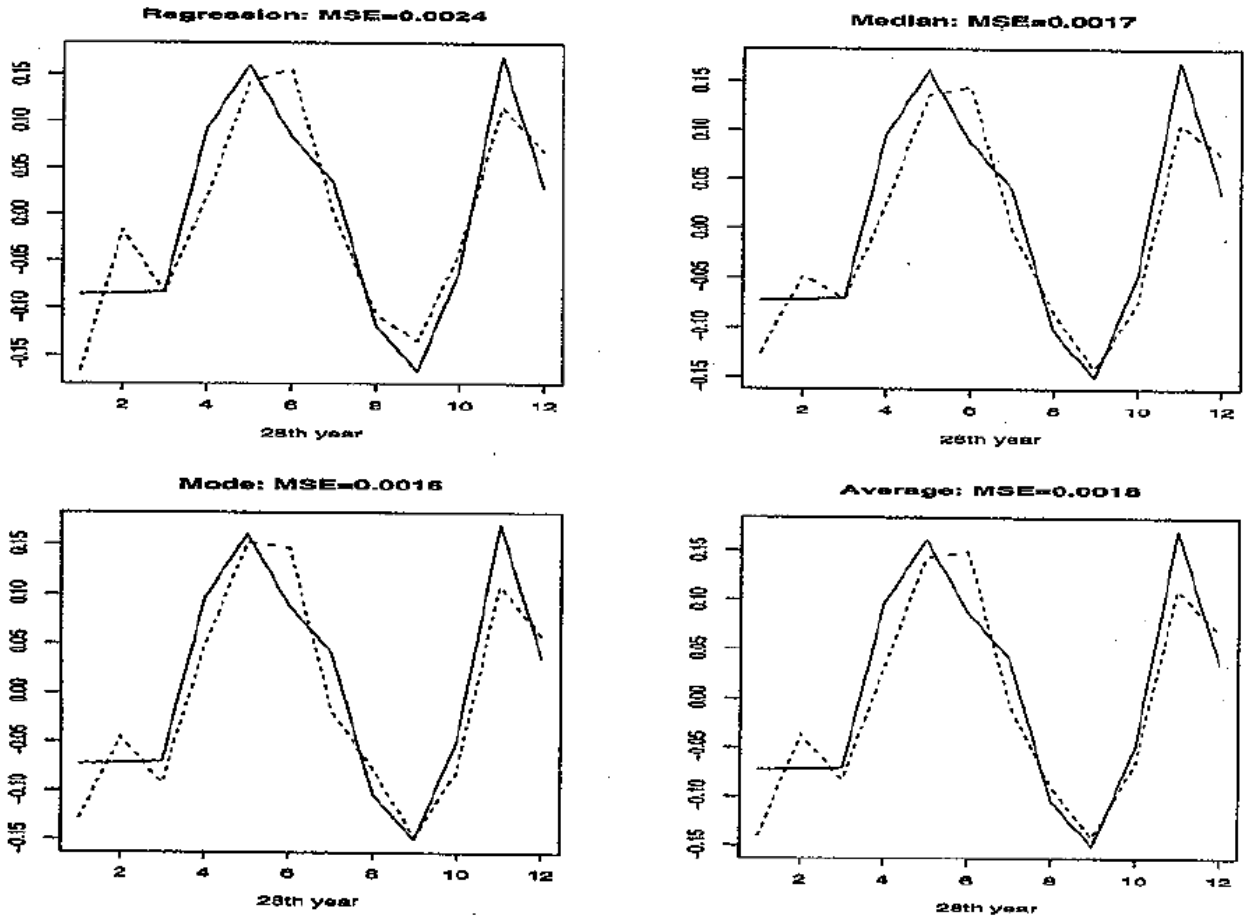

Fig. 12.1. Electricity Consumption: the Forecasting Methods in Action