COMPUTATIONAL INTENSIVE METHODS FOR PREDICTION AND IMPUTATION IN TIME SERIES ANALYSIS

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To Professor M. Ivette Gomes, an Extremal Friendship.

Abstract

One of the main goals in times series analysis is to forecast future values. Many forecasting methods have been developed and the most successful are based on the concept of exponential smoothing, based on the principle of obtaining forecasts as weighted combinations of past observations. Classical procedures to obtain forecast intervals assume a known distribution for the error process, what is not true in many situations. A bootstrap methodology can be used to compute distribution free forecast intervals. First an adequately chosen model is fitted to the data series. Afterwards, and inspired on sieve bootstrap, an AR(p) is used to filter the series of the random component, under the stationarity hypothesis. The centered residuals are then resampled and the initial series is reconstructed. This methodology will be used to obtain forecasting intervals and for treating missing data, which often appear in a real time series. An automatic procedure was developed in R language and will be applied in simulation studies as well as in real examples.
Keywords: bootstrap, forecast intervals, missing data, time series analysis.

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References


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