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Abstract

Title: Predictive Inference for Locally Stationary Time Series

The Model-free Prediction Principle of Politis (2015) has been successfully applied to general regression problems, as well as problems involving stationary time series. However, with long time series, e.g. annual temperature measurements spanning over 100 years or daily financial returns spanning several years, it may be unrealistic to assume stationarity throughout the span of the dataset. In the paper at hand, we show how Model-free Prediction can be applied to handle time series that are only locally stationary, i.e., they can be assumed to be as stationary only over short time-windows. Surprisingly there is little literature on point prediction for general locally stationary time series even in model-based setups and there is no literature on the construction of prediction intervals of locally stationary time series. We attempt to fill this gap here as well. Both one-step-ahead point predictors and prediction intervals are constructed, and the performance of model-free is compared to model-based prediction using models that incorporate a trend and/or heteroscedasticity. Both aspects, model-free and model-based, are novel in the context of time-series that are locally (but not globally) stationary. [Joint work with Srinjoy Das.]