

Predicting functional time series

Abstract Prof. Aue:

This talk addresses the prediction of functional time series. Existing contributions to this problem have largely focused on the special case of first-order functional autoregressive processes because of their technical tractability and the current lack of advanced functional time series methodology. While the linear prediction equations for any stationary functional time series can be stated explicitly, it seems in most situations infeasible to solve them in practice. Using functional principal components analysis, it is shown here how standard multivariate prediction techniques can be utilized instead. The connection between functional and multivariate predictions is made precise for the important case of vector and functional autoregressions. The proposed method is easy to implement, making use of existing statistical software packages, and may therefore be attractive to a broader, possibly non-academic, audience. Its practical applicability is demonstrated in a simulation study and an application to environmental data, namely the prediction of daily pollution curves describing the concentration of particulate matter in ambient air. It is found that the proposed prediction method, if based on the multivariate innovations algorithm, often outperforms the standard functional prediction technique. (Joint with S. Hörmann und D. Dubart Norinho).