Nonparametric Transfer Function Models with Localized Temporal Effect

John Carlo P. Daquis

A thesis submitted in partial fulfillment
of the requirements for the degree of

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ABSTRACT

The transfer function model is postulated as a semiparametric model. The effect of an input series x_t to the output series y_t is formulated as nonparametric regression. On the other hand, localized temporal effects such as seasonality, trend and structural changes present in the output series is accounted by a mixed effects model. The semiparametric additive model is then estimated via the backfitting algorithm.

Simulation study shows that the procedure provides more robust estimates for the transfer function especially for short time series. Furthermore, in the presence of seasonality or structural change, the procedure is generally more robust than the parametric transfer function procedure.