國立高雄大學統計學研究所

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題目：A Functional Time Series Model with Functional Covariates for High-Frequency Data and its Applications

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摘要

This study proposes a functional autoregressive model with functional covariates, denoted by FARX, to depict high-frequency data dynamics. A two-stage procedure is proposed to estimate the model parameters under the frameworks of an expansion of multi-resolution B-spline basis functions and an adaptive lasso criterion with a two-layer sparsity assumption. We derive the consistency of the proposed estimators under mild conditions. In the empirical study, we consider predicting Belgium's daily electricity consumption curves from Jan. 2014 to Dec. 2019 using the associated daily temperature curves of Antwerp, Belgium, as a functional covariate. The numerical results reveal that the FARX model has satisfactory prediction performances.

Keywords: B-spline, functional time series, multiresolution, two-layer sparsity adaptive Lasso criterion.

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