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Algorithms of parametric estimation of polynomial trend models of time series on discrete transforms

Ismagilov I., Khasanova S.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

A forecasting of economic and financial indicators is the actual problem of strategic management. A time series forecasting often uses simple econometric models. The trend and seasonal trend models are among the popular models for forecasting. In some cases researchers need to analyze vector time series. The traditional algorithms of estimating time series models may be associated with a sufficiently high computational complexity. We propose the applications of oblique discrete Walsh transform to the synthesis of estimation algorithms of polynomial trend models' parameters of time series. Algorithms evaluate polynomial models that not above the third degree in a non-orthogonal basis of discrete exponential functions and orthogonal basis of discrete Chebyshev polynomials. The advantage of these algorithms is the computational efficiency, which associated with a significant reduction of the multiplicative complexity of algorithms in comparing with direct estimation of polynomial trend models.

Keywords

Discrete transforms, Oblique discrete walsh transformations, Parametric estimation, Polynomial trend models, Time series