Time series in the time domain. (English) [Zbl 0578.62074] 

This book presents recent advances made in the time-domain analysis of time series. The contributions included are in several directions described in the following.

Parametrization of ARMA(X) and state-space models is discussed in chapter 9 by M. Deistler. Estimation of the parameters in such models is the main subject of chapter 1 by W. A. Fuller (nonstationary AR models), chapter 3 by G. C. Tiao (transfer function models, intervention analysis, outlier detection), chapter 4 by R. D. Martin and V. J. Yohai (robust techniques for ARMA models), chapter 5 by R. H. Jones (MLE with unequally spaced data), chapter 7 by L. Ljung (prediction error methods, instrumental variables methods, both recursive and batch algorithms), chapter 8 by P. Young (refined instrumental-variables approximate ML recursive-iterative procedures), chapter 14 by M. A. Cameron and P. J. Thomson (transfer function models, frequency characteristics), and chapter 16 by D. F. Nicholls and A. R. Pagan (varying coefficient (AR) regressions).

Estimation of the structure of time series models is reviewed in chapter 6 by R. Shibata. Various aspects pertaining to some classes of nonstationary stochastic processes are presented in chapter 10 (by M. M. Rao), chapter 11 (by C. S. K. Bhagaran), and chapter 12 (by D. K. Chang). Nonlinear time-series models (e.g. amplitude- dependent AR equations) are discussed in chapter 2 by T. Ozaki.

The problem of sampling designs for time series is covered in chapter 13 by S. Cambanis. Finally, two applications are presented in chapter 15 (speech recognition) by P. J. Thomson and P. de Souza, and in chapter 17 (estimation of large econometric models from small samples) by H. Theil and D. G. Fiebig. It should be mentioned that several other chapters contain numerical applications as illustrations of the techniques presented, particularly chapter 8 by P. Young which contains several applications to environmental, ecological and economic data.

Reviewer: P. Stoica

MSC:

62M10 Time series, auto-correlation, regression, etc. in statistics (GARCH) Cited in 3 Documents
62–02 Research exposition (monographs, survey articles) pertaining to statistics
93E12 Identification in stochastic control theory

Keywords:

Time series; ecology; time-domain analysis of time series; Parametrization; state- space models; nonstationary AR models; transfer function models; intervention analysis; outlier detection; robust techniques; ARMA models; unequally spaced data; prediction error methods; instrumental variables methods; algorithms; approximate ML recursive-iterative procedures; frequency characteristics; varying coefficient; Nonlinear time-series models; amplitude-dependent AR equations; sampling designs for time series; speech recognition; estimation of large econometric models; numerical applications