Time-series modeling in continuous-time

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Abstract:

Most empirical time-series data is based on data sampled at equispaced time-points. The statistical theory on time-series is therefore naturally focused on discrete-time continuous-state models. Many theoretic dynamic models are specified in continuous time. If a discrete-time model is used for a continuous-time phenomena the nature of the sampling process will affect the parameter values of the true discrete-time model. For this and various other reasons a direct continuous-time approach in statistical modeling is desirable. The computational approach to continuous-time models is less known. The computational aspects of stationary Gaussian ARMA (Auto-Regressive-Moving-Average) models show in Tómasson(2015) are reviewed. An R-program for univariate continuous-time ARMA is illustrated. Applications and generalizations to multivariate models and Bayesian models are discussed.