Mathematics > Statistics Theory

Statistical inference for discrete-time samples from affine stochastic delay differential equations

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(Submitted on 20 Mar 2013)

Statistical inference for discrete time observations of an affine stochastic delay differential equation is considered. The main focus is on maximum pseudo-likelihood estimators, which are easy to calculate in practice. A more general class of prediction-based estimating functions is investigated as well. In particular, the optimal prediction-based estimating function and the asymptotic properties of the estimators are derived. The maximum pseudo-likelihood estimator is a particular case, and an expression is found for the efficiency loss when using the maximum pseudo-likelihood estimator, rather than the computationally more involved optimal prediction-based estimator. The distribution of the pseudo-likelihood estimator is investigated in a simulation study. Two examples of affine stochastic delay equation are considered in detail.

Comments:	Published in at this http URL the Bernoulli (this http URL) by the International Statistical Institute/Bernoulli Society (this http URL)
Subjects:	**Statistics Theory (math.ST)**
Journal reference:	Bernoulli 2013, Vol. 19, No. 2, 409-425
DOI:	10.3150/11-BEJ411
Report number:	IMS-BEJ-BEJ411
Cite as:	**arXiv:1303.4875 [math.ST]**
	(or **arXiv:1303.4875v1 [math.ST]** for this version)

Submission history

From: Uwe Küchler [view email]

[v1] Wed, 20 Mar 2013 08:57:41 GMT (42kb)

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