Title:	Parameter Estimation in Models with Complex Dynamics
Authors:	Sinha, Somdatta (/jspui/browse?type=author&value=Sinha%2C+Somdatta)
Keywords:	Mathematical models Nonlinear Intrinsic noise
Issue Date:	2017
Publisher:	arXiv: Chaotic Dynamics
Citation:	arXiv:1705.03868 (2017).
Abstract:	Mathematical models of real life phenomena are highly nonlinear involving multiple parameters and often exhibiting complex dynamics. Experimental data sets are typically small and noisy, rendering estimation of parameters from such data unreliable and difficult. This paper presents a study of the Bayesian posterior distribution for unknown parameters of two chaotic discrete dynamical systems conditioned on observations of the system. The study shows how the qualitative properties of the posterior are affected by the intrinsic noise present in the data, the representation of this noise in the parameter estimation process, and the length of the data-set. The results indicate that increasing length of dataset does not significantly increase the precision of the estimate, and this is true for both periodic and chaotic data. On the other hand, increasing precision of the measurements leads to significant increase in precision of the estimated parameter in case of periodic data, but not in the case of chaotic data. These results are highly useful in designing laboratory and field-based studies in biology in general, and ecology and conservation in particular.
Description:	Only IISERM authors are available in the record.
URI:	https://arxiv.org/pdf/1705.03868.pdf (https://arxiv.org/pdf/1705.03868.pdf) http://hdl.handle.net/123456789/3712 (http://hdl.handle.net/123456789/3712)
Appears in Collections:	Research Articles (/jspui/handle/123456789/9)

Files in This Item:

File	Description	Size	Format	
Need to add pdf (/jspui/bitstream/123456789/3712/1/Need%20to%20add%20pdf)		8.45 kB	Unknown	View/Open (/jspui/bitstream/123456789/3712

Show full item record (/jspui/handle/123456789/3712?mode=full)
(/jspui/handle/123456789/3712/statistics)