Computer Science > Information Theory

Some Results on the Information Loss in Dynamical Systems

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(Submitted on 13 Jun 2011)

In this work we investigate the information loss in (nonlinear) dynamical input-output systems and provide some general results. In particular, we present an upper bound on the information loss rate, defined as the (non-negative) difference between the entropy rates of the jointly stationary stochastic processes at the input and output of the system.
We further introduce a family of systems with vanishing information loss rate. It is shown that not only linear filters belong to that family, but - under certain circumstances - also finite-precision implementations of the latter, which typically consist of nonlinear elements.

Comments:	6 pages, 2 figures, submitted to a conference
Subjects:	**Information Theory (cs.IT)**; Exactly Solvable and Integrable Systems (nlin.SI)
Journal reference:	Proc. IEEE Int. Sym. Wireless Communication Systems, 2011, pp. 794 - 798
DOI:	10.1109/ISWCS.2011.6125271
Report number:	(c) IEEE 2011
Cite as:	**arXiv:1106.2404 [cs.IT]**
	(or **arXiv:1106.2404v1 [cs.IT]** for this version)

Submission history

From: Bernhard C. Geiger [view email]
[v1] Mon, 13 Jun 2011 09:27:09 GMT (17kb)

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