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Title:	Synthetic computation: Chaos computing, logical stochastic resonance, and adaptive computing
Authors:	Sinha, Sudeshna (/jspui/browse?type=author&value=Sinha%2C+Sudeshna)
Keywords:	Synthetic Computation Chaos Computing Stochastic Resonance Adaptive Computing
Issue Date:	2014
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Citation:	Understanding Complex Systems, pp.51-65.
Abstract:	Nonlinearity and chaos can illustrate numerous behaviors and patterns, and one can select different patterns from this rich library of patterns. In this paper we focus on synthetic computing, a field that engineers and synthesizes nonlinear systems to obtain computation. We explain the importance of nonlinearity, and describe how nonlinear systems can be engineered to perform computation. More specifically, we provide an overview of chaos computing, a field that manually programs chaotic systems to build different types of digital functions. Also we briefly describe logical stochastic resonance (LSR), and then extend the approach of LSR to realize combi-national digital logic systems via suitable concatenation of existing logical stochastic resonance blocks. Finally we demonstrate how a chaotic system can be engineered and mated with different machine learning techniques, such as artificial neural networks, random searching, and genetic algorithm, to design different autonomous systems that can adapt and respond to environmental conditions.
Description:	Only IISERM authors are available in the record.
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