An estimation of distribution algorithm with adaptive Gibbs sampling for unconstrained global optimization

Jonás Velasco, Mario A. Saucedo-Espinosa, Hugo Jair Escalante, Karlo Mendoza, César Emilio Villarreal-Rodríguez, Óscar L. Chacón-Mondragón, Adrián Rodríguez, Arturo Berrones

(Submitted on 11 Jul 2011)

In this paper is proposed a new heuristic approach belonging to the field of evolutionary Estimation of Distribution Algorithms (EDAs). EDAs builds a probability model and a set of solutions is sampled from the model which characterizes the distribution of such solutions. The main framework of the proposed method is an estimation of distribution algorithm, in which an adaptive Gibbs sampling is used to generate new promising solutions and, in combination with a local search strategy, it improves the individual solutions produced in each iteration. The Estimation of Distribution Algorithm with Adaptive Gibbs Sampling we are proposing in this paper is called AGEDA. We experimentally evaluate and compare this algorithm against two deterministic procedures and several stochastic methods in three well known test problems for unconstrained global optimization. It is empirically shown that our heuristic is robust in problems that involve three central aspects that mainly determine the difficulty of global optimization problems, namely high-dimensionality, multi-modality and non-smoothness.

Subjects: **Neural and Evolutionary Computing (cs.NE)**; Optimization and Control (math.OC); Machine Learning (stat.ML)

Cite as: **arXiv:1107.2104 [cs.NE]**

(or **arXiv:1107.2104v1 [cs.NE]** for this version)

Submission history

From: Jonás Velasco [view email]

[v1] Mon, 11 Jul 2011 19:51:49 GMT (432kb)

Which authors of this paper are endorsers?