14th Int'l CSI Computer Conference
(CSICC'09)
Amirkabir University of Technology
Tehran, IRAN
October 20-21, 2009

Adaptive Parameter Selection Scheme for PSO: A Learning Automata Approach

Ali B. Hashemi M.R. Meybodi
Computer Engineering and Information Technology Department, Amirkabir University of Technology, Tehran, Iran
{a_hashemi, mmeybodi}@aut.ac.ir

Abstract

PSO, like many stochastic search methods, is very sensitive to efficient parameter setting. As modifying a single parameter may result in a large effect. In this paper, we propose a new a new learning automata-based approach for adaptive PSO parameter selection. In this approach three learning automata are utilized to determine values of each parameter for updating particles velocity namely inertia weight, cognitive and social components. Experimental results show that the proposed algorithms compared to other schemes such as SPSO, PSO-IW, PSO TVAC, PSO-LP, DAPSO, GPSO, and DCPSO have the same or even higher ability to find better local minima. In addition, proposed algorithms converge to stopping criteria significantly faster than most of the PSO algorithms.