عنوان مقاله:

(Real-parameter Compact Supervision for the Particle Swarm Optimization (RCSPSO

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نویسندگان:

Shermin Khosravi - *Department of Artificial Intelligence, Islamic Azad University of Mashhad, Mashhad, Iran*

Mohammad-R. Akbarzadeh-T - *Center of Excellence on Soft Computing and Intelligent Information Processing, Ferdowsi University of Mashhad, Iran*

خلاصه مقاله:

This paper proposes the Real-parameter Compact Supervision for the Particle Swarm Optimization (RCSPSO) in order to optimize problems with continuous parameters.RCSPSO uses the evolutionary configuration of the Real-valued Compact Genetic Algorithm (RCGA) and the search philosophyof the Particle Swarm Optimization (PSO). As a Compact Evolutionary Algorithms (CEA), RCGA rather than operating on a population of individuals processes a statistical representationof that population. Thus, it shows a very explorative behavior. In contrast, PSO despite having access to several solutions only usesthe best solution in order to explore the search space. Although it hardly consumes any additional memory, it provides greatinsight on the potential exploration areas to the particles. Moreover, to improve the update operation of the probability vector in RCGA, it uses an algorithm that prevents inaccurateinfluence of particle's fitness on its gene's fitness by evaluating each gene separately. Furthermore, to improve sampling the search space, the algorithm uses a combination of Cauchy and Gaussian distributions. To show the algorithm's viability, we useDifferential Evolution (DE), CEAs and PSO on some well-known benchmark functions under identical initial conditions. The results show that the proposed method outperforms the aforementioned algorithms in majority of simulation scenarios

کلمات کلیدی:

compact genetic algorithm; particle swarm optimization; differential evolution

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