Abstract

Differential Evolution (DE) is a renowned optimization stratagem that can easily solve nonlinear and comprehensive problems. DE is a well known and uncomplicated population based probabilistic approach for comprehensive optimization. It has apparently outperformed a number of Evolutionary Algorithms and further search heuristics in the vein of Particle Swarm Optimization at what time of testing over both yardstick and actual world problems. Nevertheless, DE, like other probabilistic optimization algorithms, from time to time exhibits precipitate convergence and stagnates at suboptimal position. In order to stay away from stagnation behavior while maintaining an excellent convergence speed, an innovative search strategy is introduced, named memetic search in DE. In the planned strategy, positions update equation customized as per a memetic search stratagem. In this strategy a better solution participates more times in the position modernize procedure. The position update equation is inspired from the memetic search in artificial bee colony algorithm. The proposed strategy is named as Memetic Search in Differential Evolution (MSDE). To prove efficiency and efficacy of MSDE, it is tested over 8 benchmark optimization problems and three real world optimization problems. A comparative analysis has also been carried out among proposed MSDE and
original DE. Results show that the anticipated algorithm go one better than the basic DE and its recent deviations in a good number of the experiments.

References

- JR Koza, Genetic programming: A paradigm for genetically breeding populations of computer programs to solve problems. Stanford University, Department of Computer Science, 1990.


Memetic Search in Differential Evolution Algorithm


Index Terms

Computer Science

Algorithms
Keywords
Differential Evolution  Swarm intelligence  Evolutionary computation  Memetic algorithm