The Study of Investigation of the Relationship between Parameters of Particle Swarm Optimization and Related Optimizati

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ABSTRACT

Particle Swarm Optimization, PSO, proposed by Professor J. Kennedy and R. Eberhart in 1995, is one the current and attractive optimization algorithms studied all over the whole world at the present time. Due to its simplicity, that is the parameters to be set in PSO algorithm is few, it is a really benefit for optimization searches as a main PSO algorithm. Another algorithm such as genetic algorithm uses evolution operators--- selection, crossover and mutation. In which, mutation mechanism can provide a capability of the search of optimal solution vector jumping out of the local trap in principle, therefore this mechanism can be combined well to PSO algorithm. Besides that, we introduce another mechanism called one-variable mutation to improve the former mentioned capability. In order to enhance the convergence rate of optimization search, different ω-ω_p pair is suggested in the specific PSO for specific problem. This paper ’ s study is based on the mini-project of Professor Maurice Clerc in which he suggested that if a modified PSO is good or not, compared it with this paper. In that paper, two different PSO algorithms are listed, that is standard PSO-2007 and VPSO. With four different functions, such as, Tripod, Shifted Rosenbrock function, Compression spring, and Gear train, we have suggested four different specific PSO algorithms respectively. Comparisons show that our results are better than those listed in the paper.

Keywords : Mutation、Particle Swarm optimization(PSO)、Genetic Algorithm(GA)

Table of Contents

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