Parameter tuning of metaheuristics using metaheuristics

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Using metaheuristics requires a lot of work setting different parameters. This paper presents a multilevel algorithm to tackle this issue. An upper level metaheuristic is used to determine the most appropriate set of parameters for a low level metaheuristic. This schema is applied to instances of Ant Colony System and Scatter Search metaheuristics that were designed to solve the Set Covering Problem. These algorithms had been widely used on the resolution of different optimization problems requiring an important effort on parameter setting. Here, we use a Genetic Algorithm to optimize the parameter values of Ant Colony System and Scatter Search solving the problem at hand. The idea is transferring the parameter setting effort of one algorithm to other algorithm. A multilevel approach is proposed so that one metaheuristic (Ant Colony or Scatter Search) acts as a low level metaheuristic whose parameters are tuned by a upper level metaheuristic (Genetic Algorithm). © 2013 American Scientific Publishers.

Ant colony optimization

Genetic algorithms

Metaheuristics

Optimization

Parameter setting

Scatter search