Problem Dependent Optimization

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A metaheuristic is generally a procedure designed to find a good solution to a difficult optimization problem. Known optimization search metaheuristics heavily rely on parameters, which are usually introduced so that the metaheuristic follows some supposedly related to the optimization problem natural process (simulated annealing, swarm optimization, genetic algorithms). Adjusting the parameters so that the metaheuristic performs successfully in the problem at hand could be quite tricky and time consuming task which often requires intimate knowledge of the problem and a lot of experimenting to achieve the needed level of performance. In this article I present a metaheuristic with parameters depending only on the problem at hand, which virtually eliminates the preliminary work on adjusting the parameters. Moreover, the parameters are frequently updated during the process, based on the increasing amount of information about the solution space collected during the run. The metaheuristic has been successfully applied in several different searches for discrete objects such as designs, packings, coverings and partitions.