Abstract

This paper describes a complementary mechanism that attempts to learn the structure of the search space over multiple runs of SA on a given problem[29] (Best fit Problem & First Fit Decreasing). Specifically, we introduce a mechanism that attempts to predict how (UN) promising a SA run is likely to be, based on probability distributions that are "learned" over multiple runs. The distributions, which are built at different checkpoints, each corresponding to a different value of the temperature ("temperature" is a variable which decrements its value at each step—as SA has a great relation with physics, the variable is termed in this manner) parameter used in the procedure, approximate the cost reductions that one can expect if the SA run is continued below these temperatures. Simulated annealing is a method of finding optimal values numerically. It chooses a new point, and (for optimization) all uphill points are accepted while some downhill points are accepted depending on probabilistic criteria. For certain problems, simulated annealing may be more efficient than exhaustive enumeration — provided that the goal is to find an acceptably good solution in a fixed amount of time, rather than the best possible solution.
- Fernandez del la Vega, W. and G. Lueker, Bin packing can be solved in $1 + \frac{1}{n}$ in linear time, Combinatorica 1 (1981) 34-355.
Generic Algorithm Implementation of Approximation Algorithm using Simulated Annealing (SA)

- Average-Case Analyses of First Fit and Random Fit Bin Packing, Susanne Albers, Michael Mitzenmacher,

Index Terms

Computer Science
Algorithms

Keywords

One bin packing  multiple bins packing  simulated annealing  best fit problem  first fit decreasing
meta-heuristics
constraints (parameters).