

Homework 3
CS 169/268 Optimization
Fall 2015
Due: Tuesday October 27 11:59pm on EEE

Global Optimization by Simulated Annealing

1. (UG & Grads) Implement as a black box optimizer (function evaluations only) the simulated annealing algorithm for binary-valued variables.

(a) Test it quantitatively on a scalable combinatorial optimization problem (such as graph bisection, or 0/1 knapsack with a large penalty for overfilling the knapsack, or graph-2-coloring). Up to what problem sizes are you able to get it to produce reasonable answers?

(b) Generalize the code to handle multiple discrete values. Test on such a problem, eg. graph partitioning or graph coloring.

2. (Grads and UG extra credit) Generalize your SA code to continuous real-valued variables. Compare it quantitatively on a problem of your choice to a local black-box optimization method such as coordinate descent (homework 1) or the Nelder-Mead method (which you would have to program up).

Extra credit: Choose the Nelder-Mead option in problem 2.