Traveling Salesman Problem

An Application of Simulated Annealing

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This application was developed on the NeXT version 2.0, in order to illustrate the usefulness of Simulated Annealing. We feel that it is best categorized as Optimization. It is available as freeware, but we do ask that you please register it.

This application addresses the Traveling Salesman Problem, which requires that a salesman visiting N different cities find the shortest possible route that passes through each city once and only once. It uses Simulated Annealing, an algorithm for efficiently solving nonlinear optimization problems. This problem is NP-complete: The computation time increases exponentially as the number of cities increases. For the Traveling Salesman Problem, there are (N-1)! /2 distinct routes to search. For example, with 14 cities, there are 3.1 billion routes. In this demonstration, Simulated Annealing can find a good solution usually within a few thousand trials. Although not guaranteed to get the best solution, Simulated Annealing will find a good one, which is often all one really needed, while saving a great deal of time. The above example is on the order of a million times faster than checking all possible routes.