

Improving the Efficiency of Simulated Annealing Optimization Through Detection of Productive Search

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ABSTRACT

The popularity of simulated annealing for engineering design applications has grown in recent years, increasing the need for new techniques that improve algorithm performance. Simulated annealing is a time-consuming, iteration-intensive algorithm. One area of algorithm enhancement with high potential impact is the development of methods for improving the algorithm by reducing the amount of wasted or non-productive search. This paper presents an approach to detection of productive search based on statistical process control (SPC) concepts. The proposed Detection of Productive Search (DPS) annealing schedule is compared to three other viable schedules using a 100-city traveling salesman problem. The DPS schedule produces results on par with the best from the more traditional schedules but does so with significantly fewer iterations.

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