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Application of Simulated Annealing and Genetic Algorithms to Verified Global Optimization

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Abstract— **Simulated annealing and genetic algorithms (GA's) are efficient but *heuristic* global optimization techniques in the sense that they do not give a guaranteed (verified) result.**

Interval global optimization methods do provide us with verified results, but they are often very time-consuming. It is therefore desirable to combine efficiency of simulated annealing and genetic algorithms with the verified character of interval techniques.

In this talk, we will describe such methods. The possibility to use simulated annealing and GA is based on the fact that in the existing verified global optimization methods, there is still room for choice: what box to analyze first, how to divide the box into sub-boxes, etc. No matter what choices we make, the algorithm still leads to a verified optimization. However, different choices can make the algorithm much faster or much slower. We use simulated annealing and GA to make efficient choices.

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