

Revision of local search methods in the GLOBAL optimization algorithm

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There are many suitable global optimization methods to find the minimum of a nonlinear objective function. In our presentation we improve the GLOBAL optimization method which is developed byin the Institute of Informatics, University of Szeged. GLOBAL was used successfully for the solution of very complex optimization problems.

GLOBAL is a stochastic technique that is a sophisticated composition of sampling, clustering, and local search. It compares well with other global optimization software for the solution of the low dimensional black-box-type problems (when only the objective function is available, while the derivatives should be approximated). It is usually very successful on problems where the relative size of the region of attraction of the global minimizer is not negligible.

The performance of the GLOBAL depends mainly on the applied local search method efficiency. In our presentation we try to improve the local search methods. First of all, we changed the original Unirandi random walk technique, so the direction search and the line search method became independent modules. After this we recreated the Rosenbrock method with the same modular structure. Then we have developed two new different line search methods based on polynomial interpolation schemes. In the presentation we show the efficiency of these method combinations, and the advantages of the modular structure.