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Software Implementation of Algorithms for Global Minimum Search Based on Nonlocal Methods for One-Dimensional Optimization

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Keywords: global optimization, global minimum, nonlocal one-dimensional search, algorithms library, software implementation

The paper presents a software implementation of algorithms for global minimum search based on nonlocal methods for one-dimensional optimization. Algorithms were implemented in the form of a C language library performed in a single software standard. The library includes the following algorithms: coordinate search, tunnel, Rosenbrock, partan, Powell, curvilinear search, spherical search. Modifications of the following one-dimensional algorithms have been developed and implemented: Yu.G. Evtushenko's, R. Brent's (with automatic evaluation of the Lipschitz constant), S.A. Piyavsky's, R.G. Strongin's, A. Zhiglyavsky's and A. Zilinskas's P-algorithms, A.Yu. Gornov's based on spline approximation, "parabolas", "compressive search", combined algorithm based on "parabolas" and R.G. Strongin's methods.

Multivariate computational experiments were performed with the use of the generated collection of test problems, which made it possible to identify the most competitive variants of algorithms.