CONSTRAINED GLOBAL OPTIMIZATION: MULTIPROCESSOR COMPUTATIONS

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Problem of multidimensional global optimization of a Lipschitzian function defined on the N-dimensional hypercube can be reduced to solving a one-dimensional problem over the interval [0,1] by applying a Peano space-filling curve mapping the hypercube onto the interval [0,1] of real axis (see [1,4]). For solving the one-dimensional problem there is a set of information-statistical algorithms for global search oriented at multiprocessor computations and implementing efficient parallelization [1-3].

A new approach having the potential of mass parallelism is to use for reducing multidimensional problem a set of space-filling curves (multiple mappings) [3,4]. It allows to use for solving the global optimization problem many thousands of processors and to speed up computations significantly.

This approach can be spread to global search problems with complicated Lipschitzian constraints on the base of applying the index method of constraints reduction [1]. The index method requires (as opposed to the classic penalty function method) no choice of parameters (like penalty constant), enables to solve optimization problems with multiextremal partially defined constraints and provide the possibility of significant parallelization.

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