

SOLVING GLOBAL OPTIMIZATION PROBLEMS BY PEANO SPACE-FILLING CURVES

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In this paper, the global optimization problem: $\min_{y \in S} F(y)$ with S being a hyperinterval in R^N and $F(y)$ satisfying the Lipschitz condition with an unknown Lipschitz constant is considered. It is supposed that the function $F(y)$ can be multiextremal, non-differentiable, and given as a “black-box”. To attack the problem we consider the following two ideas. First, an approach that uses numerical approximations of space-filling curves to reduce the original Lipschitz multi-dimensional problem to a univariate one satisfying the Hölder condition [1]. Second, we propose different techniques for acquiring the Hölder information that can be distinguished with respect to the way the Hölder constant is estimated during the process of optimization. In particular, we consider techniques that use either a global estimate of the Hölder constant valid for the whole search region, or local estimates H_i valid only for some subregions of the domain [2, 3].

References

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