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CARTopt: a random search method for nonsmooth unconstrained optimization. (English)

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Summary: A random search algorithm for unconstrained local nonsmooth optimization is described. The algorithm forms a partition on $\mathbb{R}^n$ using classification and regression trees (CART) from statistical pattern recognition. The CART partition defines desirable subsets where the objective function $f$ is relatively low, based on previous sampling, from which further samples are drawn directly. Alternating between partition and sampling phases provides an effective method for nonsmooth optimization. The sequence of iterates $\{z_k\}$ is shown to converge to an essential local minimizer of $f$ with probability one under mild conditions. Numerical results are presented to show that the method is effective and competitive in practice.

MSC:
90C26 Nonconvex programming, global optimization

Keywords:
nonsmooth optimization; CART; partitioning random search; numerical results

Software:
Matlab; minpack; CARTopt

Full Text: DOI

References:

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