

2021 SIAM Conference on Computational Science and Engineering (times listed are CST)

Part of [MS100 Derivative-Free Optimization Methods for Solving Expensive Global Black-Box Problems - Part I of II](#)
Mixed-Integer Derivative-Free Optimization: a Review and Computational Comparison of Software Implementations

Abstract. We review the literature on algorithms for solving bound-constrained mixed-integer derivative-free optimization problems and present a systematic comparison of available implementations of these algorithms on a large collection of test problems. We compared thirteen derivative-free optimization solvers using a test set of 188 problems. The testbed includes: (i) pure-integer and mixed-integer problems, and (ii) small, medium, and large problems covering a wide range of characteristics found in applications. We evaluate the solvers according to their ability to find a near-optimal solution, find the best solution among currently available solvers, and improve a given starting point. Computational results show that the ability of all these solvers to obtain good solutions diminishes with increasing problem size, but the solvers evaluated collectively found optimal solutions for 81% of the problems in our test set. The open-source solver NOMAD was the best performer among all solvers tested.

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