

# GLODS: GLOBAL AND LOCAL OPTIMIZATION USING DIRECT SEARCH

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Locating and identifying points as global minimizers is, in general, a hard and time-consuming task. Difficulties increase when the derivatives of the functions defining the problem are not available for use. In this work, we propose a new class of methods suited for global derivative-free constrained optimization.

Using direct search of directional type, the algorithm alternates between a search step, where potentially good regions are located, and a poll step where the previously located promising regions are explored. This exploitation is made through the launching of several directional direct searches, one in each of the regions of interest.

Differently from a simple multistart strategy, direct searches will merge when sufficiently close. The goal is to end with as many direct searches as the number of local minimizers, which would easily allow locating the global extreme value. We describe the algorithmic structure considered, present the corresponding convergence analysis and report numerical results, showing that the proposed method is competitive with currently commonly used global optimization solvers.