

# Direct multisearch for multiobjective optimization

A. Ismael F. Vaz\*

aivaz@dps.uminho.pt

Production and systems department

Engineering school, University of Minho, Portugal

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## Abstract

In practical applications it is common to have several conflicting objective functions to optimize, where derivative-based techniques cannot be applied.

We propose a novel multiobjective (MO) derivative-free methodology, called direct multisearch (DMS), which does not aggregate any of the objective functions. Our framework is inspired by the search/poll paradigm of direct-search methods of directional type and maintains a list of nondominated points. The DMS goal is to generate as many points in the Pareto front as possible from the polling procedure itself, while keeping the whole framework general enough to accommodate other disseminating strategies, in particular when using the optional search step. DMS generalizes to MO optimization all direct-search methods of directional type.

**Keywords:** Multiobjective optimization, derivative-free optimization, direct-search methods, Pareto dominance.

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