Adaptive Distance Measures in Multicriteria Optimization

Kathrin Klamroth
Friedrich-Alexander Universität Erlangen-Nürnberg, Germany

Multicriteria optimization problems have countless applications, for example, in engineering design, capital budgeting and location planning. To support the decision making process, approximations of the nondominated set are an attractive tool since they visualize the alternatives for the decision maker and provide valuable trade-off information in a simple and understandable way.

We propose an approximation approach using solutions of a series of scalarized subproblems selected in a problem-dependent way. Polyhedral distance functions based on the approximation itself are used to evaluate the quality of the approximation and to guide the selection of the next scalarization. The functions automatically adapt to the problem structure and scaling which makes the approximation process unbiased and self-driven.