

Some Views to Multiobjective Optimization with a Focus on Interactive Methods

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Abstract

In various real decision problems, we must optimize several conflicting objective functions simultaneously. This means that we must solve multiobjective optimization problems. These problems have so-called Pareto optimal solutions representing different trade-offs and they cannot be ordered mathematically without some additional information. Typically, we assume that a domain expert called a decision maker provides preference information to guide the solution process. By applying appropriate methods, we can find the best balance among the trade-offs. In this talk, I classify multiobjective optimization methods based on the role of the decision maker and devote most attention to interactive methods, where the decision maker augments the problem formulation with domain expertise. The decision maker directs the iterative solution process with one's preferences to find the most preferred solution. At the same time, the decision maker gains insight into the interdependencies and trade-offs among the conflicting objective functions and can get convinced of the quality of the most preferred solution. I demonstrate the advantages of applying interactive methods with some example problems. In addition, I give a brief overview of the modular, open-source software framework DESDEO containing different interactive methods