Numerical Methods for the Solution of Bi-Level Multi-Objective Optimization Problems

Alessandro Dell'Aere

Abstract

Both *bi-level optimization* and *multi-objective optimization* are of crucial importance in many modern sciences and accordingly they have attracted great interest in many publications of the last decades. Since many applications, in particular in the field of self-optimizing systems, become more and more complex during the last years, in this thesis we go a step ahead and consider *bi-level multi-objective optimization problems*. Such problems can be understood as bi-level optimization problems, where the subproblems of both levels are given by multi-objective optimization problems. We develop the theoretical background and practical algorithms for the solution of these problems. Convergence of the algorithms is proved and their strength is demonstrated by academic example problems and real world applications.