
JANE YE, University of Victoria

Difference of convex algorithms for bilevel programs with applications in hyperparameter selection

In this paper, we present difference of convex algorithms for solving bilevel programs in which the upper level objective functions are difference of convex functions, and the lower level programs are fully convex. This nontrivial class of bilevel programs provides a powerful modelling framework for dealing with applications arising from hyperparameter selection in machine learning. Thanks to the full convexity of the lower level program, the value function of the lower level program turns out to be convex and hence the bilevel program can be reformulated as a difference of convex bilevel program. We propose two algorithms for solving the reformulated difference of convex program and show their convergence under very mild assumptions. Finally we conduct numerical experiments to a bilevel model of support vector machine classification.