

Departamento de Matemáticas

On pessimistic bilevel optimization

Abstract: Pessimistic bilevel optimization problems, as optimistic ones, possess a structure involving three interrelated optimization problems. Moreover, their finite infima are only attained under strong conditions. We address these difficulties within a framework of moderate assumptions and a perturbation approach which allow us to approximate such finite infima arbitrarily well by minimal values of a sequence of solvable single-level problems. To this end, we introduce the standard version of the pessimistic bilevel problem.

For its algorithmic treatment, we reformulate it as a standard optimistic bilevel program with a two follower Nash game in the lower level. The latter lower level game, in turn, is replaced by its Karush-Kuhn-Tucker conditions, resulting in a single-level mathematical program with complementarity constraints.

The perturbed pessimistic bilevel problem, its standard version, the two follower game as well as the mathematical program with complementarity constraints are equivalent with respect to their global minimal points, while the connections between their local minimal points are more intricate. As an illustration, we numerically solve a regulator problem from economics for different values of the perturbation parameters.

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Información sobre el conferenciante

Graduado (1993) y doctor (1997) por la University of Trier, Oliver Stein realizó estancias postdoctorales en Virginia Tech. (EEUU) y en Alexander von Humboldt-Stiftung. Defendió su tesis de habilitación en la RWTH Aachen University, ocupando sucesivamente plazas de profesor en las mencionadas universidades de Trier y Aachen, y de catedrático en Chemnitz University of Technology, en University of Duisburg-Essen y, desde 2006, en Karlsruhe Institute of Technology.

MathScinet reseña 72 trabajos suyos, que han recibido un total de 622 citas. Su libro "Bi-level strategies in semi-infinite programming" (Kluwer, 2003) ha recibido 80 citas. Oliver Stein es actualmente Editor en Jefe de la revista Mathematical Methods of Operations Research publicada por Springer.