Regularization algorithms for solving monotone Ky Fan inequalities with application to a Nash-Cournot equilibrium model

Muu L.D., Quoc T.D.

Institute of Mathematics, VAST, Hanoi, Viet Nam; Hanoi University of Science, Hanoi, Viet Nam

Abstract: We make use of the Banach contraction mapping principle to prove the linear convergence of a regularization algorithm for strongly monotone Ky Fan inequalities that satisfy a Lipschitz-type condition recently introduced by Mastroeni. We then modify the proposed algorithm to obtain a line search-free algorithm which does not require the Lipschitz-type condition. We apply the proposed algorithms to implement inexact proximal methods for solving monotone (not necessarily strongly monotone) Ky Fan inequalities. Applications to variational inequality and complementarity problems are discussed. As a consequence, a linearly convergent derivative-free algorithm without line search for strongly monotone nonlinear complementarity problem is obtained. Application to a Nash-Cournot equilibrium model is discussed and some preliminary computational results are reported. © Springer Science+Business Media, LLC 2009.

Authors with affiliations:

• Muu, L.D., Institute of Mathematics, VAST, Hanoi, Viet Nam

• Quoc, T.D., Hanoi University of Science, Hanoi, Viet Nam

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