Set-Valued and Variational Analysis 2016 vol.24 N3, pages 499-516

# Shares Allocation Methods for Generalized Game Problems with Joint Constraints

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## Abstract

© 2015, Springer Science+Business Media Dordrecht.We consider an extension of a noncooperative game problem where players have joint binding constraints. We suggest a shares allocation approach, which replaces the initial problem with a sequence of Nash equilibrium problems together with an upper level set-valued variational inequality as master problem. This transformation maintains the monotonicity properties of the underlying mappings. We also show that the regularization yields a decomposable penalty method, which removes complex functions in constraints within the custom noncooperative game framework and provides the single-valued master problem with strengthened monotonicity of its cost mapping.

http://dx.doi.org/10.1007/s11228-015-0347-2

## Keywords

Generalized equilibrium points, Joint constraints, Noncooperative games, Penalty method, Set-valued variational inequality, Shares allocation