SÉMINAIRE

WEIGHTED AVERAGE-CONVEXITY AND COOPERATIVE GAMES

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Lemma - Salle Maurice Desplas (4 rue Blaise Desgoffe, 75006 Paris)

Séminaire du LEMMA

Alexandra SKODA (Université Paris 1)

Abstract:

We generalize the notion of convexity and average-convexity for cooperative TU games to the notion of weighted average-convexity. We show several results on the relation between weighted average-convexity and cooperative games. It is well known that the Shapley value of a convex game always belongs to the core. Looking for a weaker condition than convexity insuring that the Shapley value of a game lies in the core, Inarra and Usategui (1993) relaxed the convexity assumption by introducing the notion of average convexity. In our work, assuming that weights are associated with the players, we define weighted average-convexity and extend to this new setting some previous results. First of all, we prove that if a game is weighted averageconvex, then the corresponding weighted Shapley value is in the core. Second, we investigate the question of inheritance of weighted average-convexity for communication TU-games. We exhibit necessary conditions on the underlying graph to preserve weighted average-convexity from any communication game to the associated Myerson restricted game. In particular, we extend some conditions established in Slikker (1998) for inheritance of average-convexity.

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