Strong Price of Anarchy

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Abstract

A strong equilibrium (Aumann 1959) is a pure Nash equilibrium which is resilient to deviations by coalitions. We define the strong price of anarchy to be the ratio of the worst case strong equilibrium to the social optimum.

We study the strong price of anarchy in two settings, one of job scheduling and the other of network creation. In the job scheduling game we show that for unrelated machines the strong price of anarchy can be bounded as a function of the number of machines and the size of the coalition. For the network creation game we show that the strong price of anarchy is at most 2. In both cases we show that a strong equilibrium always exists, except for a well defined subset of network creation games.

This is joint work with Nir Andelman and Michal Feldman.