



Department of Computer Science
Research Seminars 2011

Analysis of Bottleneck Congestion and Jamming Games in Network

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Abstract

We develop Pigou like upper bounds on the Price of Anarchy of atomic congestion games. While Pigou bounds exist for congestion games with splittable flows, these are the first-ever bounds for characterizing the price of anarchy of atomic flows in bottleneck congestion games. Ours is a universal technique that leads to the derivation of PoA bounds of every bottleneck congestion game, where player costs are arbitrary concave functions of resource latency. We also characterize a large class of utility function for which these bounds are tight, thus motivating the study of a large class of games with applications in network routing, scheduling and cloud computing. I will also talk about introduced two novel concepts - Price of Jamming (PoJ) and Paradox of Jamming. The PoJ is a concept analogous to the Price of Anarchy and measures the qualitative impact of jammers on network routing equilibria. The Paradox of Jamming quantifies the fact that sometimes jamming has counterintuitive impacts - a network can actually have better routing equilibria in the presence of jammers.