

Asymptotics of large games: Wardrop vs Poisson

Marco Scarsini

Abstract

Congestion is a pervasive phenomenon in transportation networks, both in large urban areas as well as in telecommunications. We revisit the concept of Wardrop equilibria for routing games, as a continuous approximation for finite games with an increasing number of small players.

We consider two scenarios: a deterministic model in which players have a small weight, and also a stochastic scenario in which players are non-negligible but are present with a small probability. In both cases we establish the convergence towards two different Wardrop models, where in the second case the flows in the network retain their stochastic nature and are described by Poisson distributions which can be interpreted as a Poisson equilibrium in the sense of Myerson. We also discuss some recent results regarding the behavior of the Price-of-Anarchy under intermediate and high congestion regimes.

Joint work with: Roberto Cominetti, Marc Schroeder, Nicolás Stier-Moses