

Best response dynamics on random graphs

Nikolaos Fountoulakis

We consider evolutionary games on a binomial random graph $G(n,p)$. These games are determined through 2-player symmetric game with 2 strategies played between the incident members of the vertex set. Players/vertices update their strategies synchronously: at each round, each player selects the strategy that is the best response to the current profile of strategies its neighbours play. We show that such a system reduces to generalised majority and minority dynamics. We show rapid convergence to unanimity for p in a range that depends on a certain characteristic of the payoff matrix. In the presence of a bias among the pure Nash equilibria of the game, we determine a sharp threshold on p above which the largest connected component reaches unanimity with high probability, and below which this does not happen.

This is joint work with Jordan Chellig and Calina Durbac.