

Mark Broom (City University London)

Modelling evolution in structured populations involving multiplayer interactions

Abstract

Within the last ten years, models of evolution have begun to incorporate structured populations, including spatial structure, through the modelling of evolutionary processes on graphs (evolutionary graph theory). One limitation of this otherwise quite general framework is that interactions are restricted to pairwise ones, through the edges connecting pairs of individuals. Yet many animal interactions can involve many individuals, and theoretical models also describe such multi-player interactions. We shall discuss a more general modelling framework of interactions of structured populations, including the example of competition between territorial animals. Depending upon the behaviour concerned, we can embed the results of different evolutionary games within our structure, as occurs for pairwise games such as the Prisoner's Dilemma or the Hawk-Dove game on graphs. Finally we consider some example population structures and evolutionary dynamics.