EVOLUTIONARY GAME DYNAMICS

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Evolutionary game dynamics is at the interface of dynamical systems and game theory. The state space of such a dynamic is the mixed strategy simplex of the underlying game. The dynamic describes how the strategy distribution in a large population of players changes over time, due to selection, imitation or other kinds of adaptation [4,5,7,8]. The Nash equilibria are rest points of the dynamics. Additional conditions such as evolutionary stability or zero-sum game often imply asymptotic stability under such dynamics. This is shown using suitable Ljapunov functions [1,2,6]. The classical examples are the replicator dynamics [4] and the best response dynamics [6], but recently several other ‘canonical’ evolutionary dynamics have been found [8].

In potential games all orbits of these dynamics converge to the set of equilibria. But there are games where none of these dynamics converges to equilibrium [4]. Furthermore, extinction versus survival of dominated strategies under these dynamics [3] will be discussed.

References

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