SOME RESULTS ON EVOLUTIONARY GAMES

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Abstract: N players sit around a circle to play some game like prisoner's dilemma game or coordination game in which each player has only two strageties to play against his two neighbors. At time period $n = 1, 2, ...$, each player will first find, based on his payoff at time $n-1$, a strategy that would benefit him most in the next play, and then declares his final strategy by allowing to make a mistake independently with a small probability ϵ. The setup is like in interacting particle systems and the mutation mechanism is vital as in biological evolutions. The goal is to find $\lim_{\epsilon \to 0} \mu_\epsilon$, where μ_ϵ is the invariant measure as time goes to ∞ with ϵ fixed.

For coordination game, there are two Nash equilibria: (C, C) and (D, D). We wish to find out which state, all-C or all-D, will stand out in the long-run.

For prisoner's dilemma game, there is a unique Nash equilibria: (confess, confess). We wish to find out under what conditions on the payoff parameters, one can escape from the all-confess state, so as to be out from the dilemma.

References

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