

The Condition for Cooperation in Evolutionary Game on Complex Network

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We study the rule of favoring cooperation in an evolutionary game on networks. There are two kinds of players: cooperators and defectors. Cooperators pay benefit b to neighbors at the cost of c , while defectors only receive benefit. We find that the approximate rule for enhancing cooperation is $b/c > \langle k_{nn} \rangle$, where $\langle k_{nn} \rangle$ is the mean degree of nearest neighbors. We also show that among representative networks: regular, random and scale free, regular network favors cooperation most while scale free network least. On an ideal scale free network cooperation is unfeasible.

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