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Food sharing gave birth to social networks

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Abstract

Social networks present distinctive features when compared with other types of networks, particularly the presence of communities, which are subsets of nodes much more densely connected among themselves, than with the rest of the network. In this work, we propose an explanation for this pattern based on the following: groups may be the community solution of hunter-gatherer societies to the survival problem posed by the uncertainty of food. We propose a multi-agent model inspired by a food-sharing dynamic, which combines and formalizes two main notions discussed by some anthropological literature: the reciprocity in the exchanges of food, plus the care for the general welfare of agents. Our preliminary results show that near-to-optimal food-sharing networks exhibit highly-connected groups around special agents that we call hunters, those who inject food into the system. We show the robustness of these results by computer simulations and also by analytical arguments for these simulations.