

Logical dynamics in large games

Prof. R. Ramanujam (IMSc, Chennai)

How would you strategize in a game with say, 50 players? If the games were repeated many times, and you saw that your neighbour was doing well in several previous rounds, would you be tempted to imitate the neighbour in the next round? Would that be rational on your part? What about a game with 50,000 players? Does your strategizing scale up?

In games with a large number of players, outcomes are associated not with the actual tuple of strategies chosen by players but with the distribution of what fraction of players choose which move. The pattern of reasoning in such games is different from those in which all players know each others' types. We discuss Nash equilibria, and some formulations of stability in such large games. When player types are specified by formulas in a logic, we can show existence of equilibria in finite memory strategies.