Seminar

12th December 2018 - h. 15.00
Sala Riunioni (Department of Physics)

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"Learning to Flock, Flocking to Learn"

Abstract

Agents in many animal species aggregate in space and exhibit spectacular collective behaviour. The example of one of such instances is the murmurations of few thousands of sterling birds. The reasons for the aggregation and collective behavior has a profound bio-inspired reasons such as efficient foraging, protection of the group from predators, breeding etc. We study such multi-agent systems with reinforcement learning to understand the decision making process by individual agents that leads to the collective behavior. We set in the reward for agents that encourage aggregation. Starting from the farrago, naive agents learn to optimize this reward via reinforcement learning and discover the near optimal policies that allow agents to not only aggregate but form a highly polar ordered states such as observed in real flocks. These near-optimal policies relate with the already well known statistical physics models that study flocking, such as the Vicsek model.