Taking tendency into account: a new paradigm for collective dynamics

Abstract:
We discuss the collective dynamics of systems driven by the “social engagement” of agents with their local neighbors. Canonical models are based on environmental averaging, with prototype examples in opinion dynamics, flocking, self-organization of biological organisms, and rendezvous in mobile networks. The large time behavior of such systems leads to the formation of clusters, and in particular, the emergence of “consensus of opinions”.

We propose an alternative paradigm, arguing that in many relevant scenarios social interactions involve the tendency of agents “to move ahead”. We introduce a new family of models for collective dynamics with tendency. The large time behavior of these new systems leads to the emergence of “leaders”.