

Continuum limits of collective dynamics with time-varying weights

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In this talk, we will derive the mean-field limit of a collective dynamics model with timevarying weights. The limit equation is a transport equation with source, where the (non-local) transport term corresponds to the position dynamics, and the (non-local) source term comes from the weight redistribution among the agents. We show existence and uniqueness of the solution and introduce a new empirical measure (in the position space) taking into account the weights. Continuity with respect to the initial data allows us to prove the convergence of the microscopic system to the macroscopic equation. This mean-field limit can be derived if the particles' dynamics preserve indistinguishability. If they do not, another point of view consists of deriving the so-called graph limit. We will introduce the graph limit and show the subordination of the mean-field limit to the graph limit equation.