

A CUCKER-SMALE INSPIRED DETERMINISTIC MEAN FIELD GAME WITH VELOCITY INTERACTIONS

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ABSTRACT

We introduce a mean field game model for pedestrians moving in a given domain and choosing their trajectories so as to minimize a cost including a penalization on the difference between their own velocity and that of the other agents they meet. We aim at proposing a simple model which is a bridge between some collective motion models such as the well-studied Cucker-Smale model, mainly applied to flock behavior, and the theory of Mean Field Games. We prove existence of an equilibrium in a Lagrangian setting by using its variational structure, and then study its properties and regularity.