

Fully nonlinear mean field games with nondifferentiable Hamiltonians

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Mean field games are systems of partial differential equations modelling the Nash equilibria of dynamic differential games for large populations of players.

In their full generality this system is fully nonlinear and may involve a nondifferentiable Hamiltonian - in which case not only is the analysis more involved than in the usual quasilinear case (with a differentiable Hamiltonian), but even the statement of the problem is not so obvious.

In this talk we discuss a novel approach to studying this problem by introducing a non-standard variational inequality formulation.

Under reasonable assumptions, such as assuming the Hamiltonian satisfies a uniform Cordes condition, we show that this variational inequality formulation admits a solution and moreover this solution is unique under the usual monotonicity assumptions.

This talk is based on joint work with Iain Smears (UCL).