Du
09
JUIN.
2023

15h30
-
16h30

SÉMINAIRE DES DOCTORANTS DE FIME

Error estimates of a theta-scheme for second-order mean field games

Institut Henri Poincaré
Salle 421

INSCRIPTION

We introduce and analyze a new finite-difference scheme, relying on the theta-method, for solving monotone second-order mean field games. These games consist of a coupled system of the Fokker-Planck and the Hamilton-Jacobi-Bellman equation. The theta-method is used for discretizing the diffusion terms: we approximate them with a convex combination of an implicit and an explicit term. On contrast, we use an explicit centered scheme for the first-order terms. Assuming that the running cost is strongly convex and regular, we first prove the monotonicity and the stability of our theta-scheme, under a CFL condition. Taking advantage of the regularity of the solution of the continuous problem, we estimate the consistency error of the theta-scheme. Our main result is a convergence rate of order $O(h^r)$ for the theta-scheme, where h is the step length of the space variable and $r \in (0,1)$ is related to the Hölder continuity of the solution of the continuous problem and some of its derivatives.

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HORAIRES

L'institut :
• lundi au vendredi de 8h30 à 18h,
• fermé les jours fériés.

Le musée - Maison Poincaré :
• lundi, mardi, jeudi et vendredi
de 9h30 à 17h30,
• samedi de 10h à 18h,
• fermé le mercredi et le dimanche.