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Hong Kong - Singapore joint Seminar Series in Financial Mathematics/Engineering

Path-dependent mean-field game optimal planning

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Abstract

In the context of mean-field games, with possible control of the diffusion coefficient, we consider a path-dependent version of the planning problem introduced by P.L. Lions: given a pair of marginal distributions (μ_0, μ_1), find a specification of the game problem starting from the initial distribution μ_0, and inducing the target distribution μ_1 at the mean-field game equilibrium. Our main result reduces the path-dependent planning problem into an embedding problem, that is, constructing a McKean-Vlasov dynamics with given marginals (μ_0,μ_1). Some sufficient conditions on (μ_0,μ_1) are provided to guarantee the existence of solutions. We also characterize, up to integrability, the minimum entropy solution of the planning problem. In particular, as uniqueness does not hold anymore in our path-dependent setting, one can naturally introduce an optimal planning problem which would be reduced to an optimal transport problem along with controlled McKean-Vlasov dynamics.

About the speaker

Junjian Yang received his PhD from the University of Vienna in 2016. After his PhD study, he worked as a postdoc at the École Polytechnique in Paris. Since 2018, he is an assistant professor at the Vienna University of Technology. His research interests are mainly in the theory of stochastic analysis, stochastic control theory and their applications in mathematical finance.

Date

27 Apr 2022(Wednesday) (HK Time)

Time

4:00pm – 5:00pm (HK Time)

Zoom

https://cityu.zoom.us/j/95856162264?pwd=RWE4WWErd3BDVEVkKzBVQ25IUEh5QT09

Meeting ID: 958 5616 2264

Passcode: 931597