Hong Kong Consortium of Quantitative Finance

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

A coupling approach to the turnpike phenomenon in stochastic control and McKean-Vlasov control

Prof. Giovanni Conforti
Ecole Polytechnique

Abstract

Coupling methods provide a powerful toolbox for the quantitative analysis of the long-time behaviour of Markov processes. In particular, coupling by reflection allows to establish sharp exponential convergence results in Wasserstein distance for the Fokker-Planck equation without having to rely on pointwise assumptions on the confinement potential. The purpose of this talk is to illustrate the construction of a variant of coupling by reflection that applies to optimally controlled diffusion processes, including controlled McKean-Vlasov processes. Such construction opens the door for a precise study of the long-time behaviour of optimizers: in particular it provides with uniform in time gradient (and Hessian) estimates for the solution of Hamilton-Jacobi-Bellman equations that enable to prove various kind of exponential turnpike properties for the optimal processes and controls. This talk is partially based on joint work with Katharina Eichinger, Alain Durmus, and Alekos Cecchin.

About the speaker

Prof. Conforti got his PhD in 2015 jointly from the University of Padova, Potsdam and the Berlin Mathematical School. After postdocs in Leipzig and Lille, he joined Ecole Polytechnique as an Assistant Professor in 2017. His research interest covers stochastic mass transport problems, with focus on the Schrödinger problem, large deviations, stochastic control and the turnpike phenomenon as well as functional inequalities.

Date:
Thursday, Jan 26, 2023 (HK Time)

Time:
4:30–5:30 pm (HK Time)

Zoom link:
https://hkust.zoom.us/j/93280180675?pwd=SUwwTHJkUjN2bmNqdktDUVB1Z015UT09

Meeting ID:
932 8018 0675

Passcode:
3485