Séminaire de Probabilités et Statistique

Mardi 23 Novembre à 14h00

Laboratoire Dieudonné

Salle de réunion Fizeau

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Lions calculus and coupled Hopf algebras with applications to probabilistic rough paths

In this talk, I will explain some of the foundation results for a new regularity structure developed to study interactive systems of equations and their mean-field limits. At the heart of this solution theory is a Taylor expansion using the so called Lions measure derivative. This quantifies infinitesimal perturbations of probability measures induced by infinitesimal variations in a linear space of random variable.

I will explore how basic properties of Lions derivatives evolve into the structures of a coupled Hopf algebra and describe the associated solution theory for rough mean-field equations.

This allows us to formulate solutions of McKean-Vlasov equations in a pathwise setting while simultaneously capturing the dynamics of the solution law.

This talk is based on ArXiv:2106.09801 and ongoing work with my supervisor Francois Delarue