

Matthias Erbar (Bonn)

Gradient flows of the entropy for jump processes

Abstract

In the last decade optimal transport has proven very successful in the study of diffusion processes and the associated PDEs. The aim of this talk is to present a link between the theory of jump processes and non-local operators and techniques from optimal transport. We introduce a new transport distance between probability measures that is built from a Levy jump kernel via a non-local variant of the Benamou–Brenier formula. We study various properties of this distance. As the main result we identify the semigroup generated by the associated non-local operator as the gradient flow of the relative entropy w.r.t. the new distance. This applies e.g. to the fractional heat equation and provides a non-local analogue of the celebrated result by Jordan–Kinderlehrer–Otto.