A new transportation distance between non-negative measures

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Given a bounded domain Ω, it is by now well-known that that the gradient flow of the entropy functional \( \int_{\Omega} [\rho \log(\rho) - \rho] dx \), w.r.t. the Wasserstein distance, produces a solution to the heat equation with Neumann boundary conditions. Recently, in collaboration with Nicola Gigli we introduced a new transportation distance between non-negative measures inside a domain Ω. This distance enjoys many nice properties: for instance, it makes the space of non-negative measures inside Ω a geodesic space without any convexity assumption on the domain. Moreover, the gradient flow of the entropy functional \( \int_{\Omega} [\rho \log(\rho) - \rho] \) w.r.t. this distance coincides with the heat equation subject to the Dirichlet boundary condition equal to 1. In this talk I will first review the classical theory, and then I’ll introduce this new distance and show its main properties.

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