Séminaire général de l'IPhT

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Mardi 26/11/2019, 11:00-12:00

Orme des Merisiers Salle Claude Itzykson, Bât. 774

Optimal transport at finite temperature

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Optimal transport (OT) has become a discipline by itself that offers solutions to a wide range of theoretical problems in probability and mathematics. Despite its appealing theoretical properties, solving the OT problem involves the resolution of a linear program whose computational cost can quickly become prohibitive whenever the size of the problem exceeds a few hundred points. The recent introduction of entropy regularization, however, has led to the development of fast algorithms for solving an approximate OT problem. The successes of those algorithms have resulted in a popularization of the applications of OT in several applied fields such as imaging sciences and machine learning, and in data sciences in general. Problems remain, however, as to the numerical convergence of those regularized approximations towards the actual OT solution. In addition, the physical meaning of this regularization is unclear. In this talk, I will describe a novel approach to solving the discrete balanced and unbalanced OT problems using techniques adapted from statistical physics. I will illustrate applications of this framework to the problem of image comparison as well as to the problem of comparing three dimensional shapes.