

Convex duality in nonlinear optimal transport

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We study problems of optimal transport, by embedding them in a general functional analytic framework of convex optimization. This provides a unified treatment of a large class of related problems in probability theory and allows for generalizations of the classical problem formulations. General results on convex duality yield dual problems and optimality conditions for these problems. When the objective takes the form of a convex integral functional, we obtain more explicit optimality conditions and establish the existence of solutions for a relaxed formulation of the problem. This covers, in particular, the mass transportation problem and its nonlinear generalizations. The presentation is based on joint work with Ari-Pekka Perkkiö.