

THE WASSERSTEIN-MARTINGALE PROJECTION OF A BROWNIAN MOTION GIVEN INITIAL AND
TERMINAL MARGINALS

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In classical optimal transport, a central quest is to determine the stochastic process interpolating between initial and terminal marginals which is as close as possible to a constant speed process. In the emerging field of martingale optimal transport we claim that the analogous question is: what is the stochastic process interpolating between initial and terminal marginals which is as close as possible to a constant volatility process (i.e. Brownian motion)?

The answer to the above question is the so-called stretched Brownian motion. In this talk we will introduce this object and present its remarkable connection to Brenier maps. This is achieved via duality techniques which are at the same time remarkably similar and yet substantially different from the classical optimal transport case. To date, little is known about how to compute / approximate these objects, but a number of open questions concerning such computational aspects will be provided.

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