Causal optimal transport with entropic regularization

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This talk showcases the use of entropic regularization for the causal (also called adapted) optimal transport problem. Causal optimal transport is applied in settings where the marginals are distributions of a time-series, and where one imposes an additional constraint on the couplings enforcing a temporal structure. As in the classical optimal transport problem, we show that the approximation error arising from entropic regularization can be controlled for causal optimal transport. Further, the proof of convergence can be used to obtain quantitative error estimates which are sharp even in the classical case. Further, we will define an adapted version of Sinkhorn's algorithm and show that it converges linearly, which builds on the dual formulation and causal versions of the Schrödinger equations.

Joint work with Marcel Nutz (Columbia University, USA) and Gudmund Pammer (ETH Zürich, Switzerland).