

Inverse optimal transport

Clarice Poon

In this talk, I will discuss a particular inverse problem arising from Optimal transport (OT). OT is now a central modeling tool to compare and couple probability distributions, with applications spanning economics, imaging, generative modeling, and computational biology. In many modern pipelines, however, the transport cost is not known a priori and must be inferred from data. This leads to inverse optimal transport (iOT): recover the ground cost (or metric parameters) from an observed optimal coupling. On the other hand, modern computational pipelines typically exploit an entropic regularization variant (eOT) of OT. I will discuss iOT in a regime that is both mathematically delicate and practically unavoidable: the entropic regularization level is small (approaching the unregularized OT model), while the coupling is observed through a finite number of samples. I will discuss well-posedness of this inverse problem as well as present conditions where iOT has statistically efficient bounds.