Optimization

Invariant OT

Algorithm*: alternating minimization on $\mathbf{\Gamma}, \mathbf{P}$

$$\min_{\Gamma\in\Pi(\mathbf{a},\mathbf{b})} \min_{\mathbf{P}\in\mathcal{F}_p} \sum_{ij} \Gamma_{ij}\, d(\mathbf{x}_i, \mathbf{P}\mathbf{y}_j)$$

*various other optimization approaches investigated in Thesis

Repeat until convergence

p-Schatten norm

[Theorem] This has a closed form solution under simple conditions!

For a fixed Γ, obtain $\mathbf{P}$ via SVD

For a fixed $\mathbf{P}$, obtain (approximate) $\boldsymbol{\Gamma}$ via Sinkhorn-Knopp

This is still a classic OT problem on Γ

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Invariant OT
toy dataset experiments

Classic OT

ℓ_∞-invariant OT