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OT with Invariances

First Approach:

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- Choose an invariance class (e.g., rotations, reflections)

- Want to find best (soft) matching **and** best global registration between spaces

- Variations of this objective have been proposed in many contexts (ICP, SoftAssign Procrustes, etc)

- Often tailored to 2D/3D

- Poor scalability / stability

- We seek a formulation that is sufficiently general yet efficiently optimizable.

$$\min_{\Gamma \in \Pi(\mathbf{a},\mathbf{b})} \min_{\mathbf{P} \in \mathcal{F}} \sum_{ij} \Gamma_{ij}\, d(\mathbf{x}^{(i)}, \mathbf{P}\mathbf{y}^{(j)})$$

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Classic OT

$\mathscr{F}$-Invariant OT

AM, Jegelka, Jaakkola. AISTATS 2019

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Invariance
with Schatten-balls