

Hypothesis testing with Hellinger-Kantorovich distance

Let μ and ν be two measures, supported on \mathbb{R}^d with *unequal mass*:

$$\int_{\text{supp}(\mu)} \mu(dx) = M_\mu, \quad \int_{\text{supp}(\nu)} \nu(dx) = M_\nu, \quad M_\mu \neq M_\nu.$$

Both μ and ν are not known and their empirical counterparts $\hat{\mu}$, $\hat{\nu}$ are given instead:

$$\sum_{x \in \text{supp}(\hat{\mu})} \hat{\mu}(x) = \widehat{M}_\mu, \quad \sum_{x \in \text{supp}(\hat{\nu})} \hat{\nu}(x) = \widehat{M}_\nu,$$

and a question of interest is

$$H_0 : M_\mu = M_\nu, \quad H_1 : M_\mu \neq M_\nu.$$

The test statistics is based on Hellinger-Kantorovich distance [LIE15].

Workpackages:

1. Construct a test based on HK-distance, investigate its theoretical properties;
2. Construction of non-asymptotic confidence sets;
3. Development and implement of effective computational procedure

Contacts

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Literature

[LIE15] Liero M., Mielke A., Savaré G. Optimal Entropy-Transport problems and a new Hellinger-Kantorovich distance between positive measures // arXiv preprint arXiv:1508.07941. – 2015.