The Linearized Hellinger-Kantorovich Distance

Bernhard Schmitzer
Uni Goettingen
`schmitzer@cs.uni-goettingen.de`

Optimal transport provides a geometrically intuitive Lagrangian way of comparing distributions by mass rearrangement. The metric can be approximated by representing each sample as deformation of a reference distribution. Formally this corresponds to a local linearization of the underlying Riemannian structure. When combined with subsequent data analysis and machine learning methods this new embedding usually outperforms the standard Eulerian representation. We show how the framework can be extended to the unbalanced Hellinger–Kantorovich distance to improve robustness to noise and mass fluctuations.

Joint work with: Tianji Cai, Junyi Cheng, Matthew Thorpe

References

[1] T. Cai, J. Cheng, B. Schmitzer, and M. Thorpe. The linearized Hellinger–Kantorovich distance. SIAM Journal on Imaging Sciences 15(1), 45–83, 2022.