

Measure-preserving mappings from the unit cube to spheres and projective spaces

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Abstract: The problem of finding measure-preserving mappings from one manifold to another has received considerable attention over the past few years due to their numerous applications in fields like cartography, computer graphics, medical imaging, signal processing, or, in general, in any area that requires good discretizations of a certain space. Thus, when looking for uniform collections of points or uniform grids (that is, grids all of whose cells have the same volume) on a manifold \mathcal{M} , a frequent approach consists on generating points or grids with that property on a simpler, easily discretizable space, like the unit cube, and then transporting them to \mathcal{M} through a measure-preserving mapping. In this sense, most of the research has been carried out for two-dimensional and three-dimensional manifolds, but little is known for higher-dimensional spaces.

In this poster ([1]) I will show how to construct measure-preserving mappings from the unit d -dimensional cube to the compact rank one symmetric spaces, namely the d -dimensional sphere, the real, complex, and quaternionic projective spaces, and the Cayley plane.

This is joint work with Carlos Beltrán and Damir Ferizović.

References

- [1] C. Beltrán, D. Ferizović, P. R. López-Gómez. Measure-preserving mappings from the unit cube to some symmetric spaces. Preprint [arXiv:2303.00405](https://arxiv.org/abs/2303.00405).