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APPROXIMATION OF BLASCHKE-SANTAL'O DIAGRAMS

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Identifying Blaschke-Santal´o diagrams is an important topic that essentially consists in determining the image Y = F (X) of a map F : X → Rd, where the dimension of the source space X is much larger than the one of the target space. In some cases, that occur for instance in shape optimization problems, X can even be a subset of an infinite-dimensional space. The usual Monte Carlo method, consisting in randomly choosing a number N of points x1, . . . , xN in X and plotting them in the target space Rd, produces in many cases areas in Y of very high and very low concentration leading to a rather rough numerical identification of the image set. On the contrary, our goal is to choose the points xi in an appropriate way that produces a uniform distribution in the target space. In this way we may obtain a good representation of the image set Y by a relatively small number N of samples which is very useful when the dimension of the source space X is large (or even infinite) and the evaluation of F (xi) is costly.

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