

BILIPSCHITZ INVARIANTS

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Machine learning algorithms are designed for data in Euclidean space. When naively representing data in a Euclidean space V , there is often a nontrivial group G of isometries such that different members of a common G -orbit represent the same data point. To properly model such data, we want to map the set V/G of orbits into Euclidean space in a way that is bilipschitz in the quotient metric. In this talk, we show that G needs to be pretty special for there to exist a polynomial invariant that is bilipschitz, and so we need to move beyond classical invariant theory to solve our problem. We find optimal bilipschitz embeddings in various settings, and we conclude with several open problems.

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