

1154-68-803

Keaton Hamm* (hamm@math.arizona.edu) and **Nick Henscheid**. *Wasserstein ISOMAP for Image Manifold Learning*. Preliminary report.

In many data-driven problems, a fundamental task is to find a dimensionality reduction map which faithfully represents the low-dimensional structure of the data. One method which addresses this problem is ISOMAP, which attempts to learn geodesics of a manifold which fits the data and uses these to embed the data into a smaller Euclidean space. A key step in this process is to associate a weighted graph to the data whose edge weights are the Euclidean distance between the points, but this procedure has some known drawbacks in learning manifolds of images. To get around this problem, we propose the use of the Wasserstein metric on the image space to faithfully give geodesics between images. We will discuss the theory for certain image manifolds and illustrate the effectiveness of this method on several examples. (Received September 10, 2019)