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Mustafa Hajj*, mustafahajj@gmail.com. *Manifold Learning Using Persistent Homology on the Laplacian Eigenfunctions*. Preliminary report.

We use persistent homology along with the eigenfunctions of the Laplacian to study similarity amongst triangulated 2-manifolds. Our method relies on studying the lower-star filtration induced by the eigenfunctions of the Laplacian. This gives us a shape descriptor that inherits the rich information encoded in the eigenfunctions of the Laplacian. Moreover, the similarity between these descriptors can be easily computed using tools that are readily available in Topological Data Analysis. We provide experiments to illustrate the effectiveness of the proposed method. (Received September 18, 2019)