

Transferring diffusion based manifold learning to trajectories, time varying data, and geometric deep learning

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Diffusion based manifold learning (e.g., locally linear embedding, Laplacian eigenmaps and diffusion maps, and subsequent variants) has been incredibly successful over the last 10-15 years in the realm of unsupervised geometric data analysis, particularly when the data lies on or near a low dimensional, compact Riemannian manifold. In this talk we use these ideas as the foundation for exploring other settings, in particular trajectory data, which arises often in biology; time varying data that is not modeled by an underlying dynamical system; and the emerging field of geometric deep learning.