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**Project 4**

T-distributed stochastic neighbor embedding (t-SNE) algorithm

t-SNE is a nonlinear embedding algorithm that is particularly adept at preserving points within clusters.

Locally-Linear Embedding (LLE)

**t-Distributed Stochastic Neighbor Embedding (t-SNE)** reduces dimensionality while trying to keep similar instances close and dissimilar instances apart. It is mostly used for visualization, in particular to visualize clusters of instances in high-dimensional space (e.g.,to visualize the MNIST images in 2D).

**Locally Linear Embedding (LLE)** is another very powerful nonlinear dimensionality reduction (NLDR) technique. It is a Manifold Learning technique that does not rely on projections like the previous algorithms. In a nutshell, LLE works by first measuring how each training instance linearly relates to its closest neighbors (c.n.), and then looking for a low-dimensional representation of the training set where these local relationships are best preserved (more details shortly). This makes it particularly good at unrolling twisted manifolds, especially when there is not too much noise.