Spectral multidimensional scaling (Technion)

code: COM-1550

Multi-Dimensional Scaling aims to reduce the dimensionality of a data set by embedding it in a low dimensional flat space so that it is possible to compare, categorize, and correspond between isometric shapes. However, the computation of all the inter-distances is computationally demanding in both space and time. Methods using subsampling and a reduced set of points tend to be slow, complicated, unable to handle enough points and likely to lose some of the geometric structure of the information. The proposed method is to use the notion of smooth interpolation. The mathematical relation that comes from this justifies the spectral embedding of the geodesic distance function, while the examples demonstrate its usefulness for accurate and efficient shape analysis, matching in computer-aided diagnostics in medicine, big data reduction, big data simplification, and big data visualization.

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