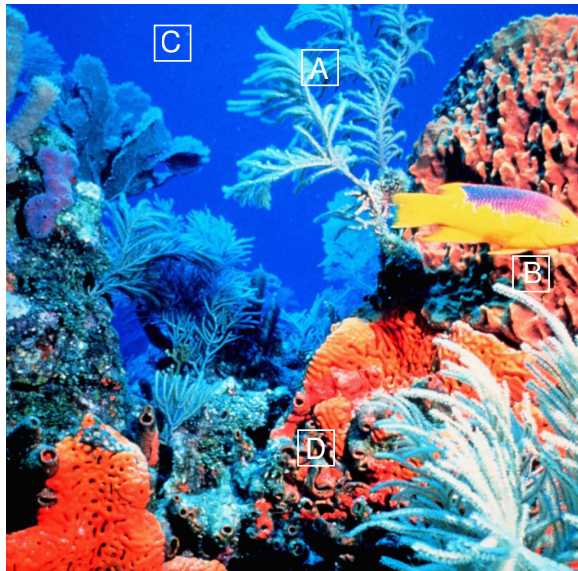


Intrinsic Principal Component Analysis for Symmetric Positive Definite Matrices

Inbal Horev (TokyoTech), Florian Yger (UTokyo) and Masashi Sugiyama (UTokyo)

Motivation

Region Covariances used in Computer Vision

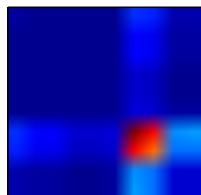
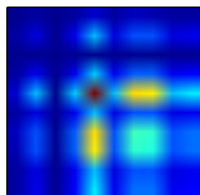
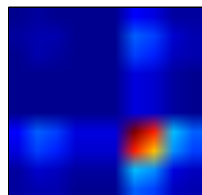
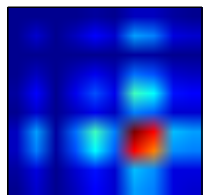


A

B

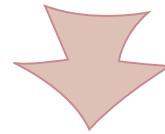
C

D

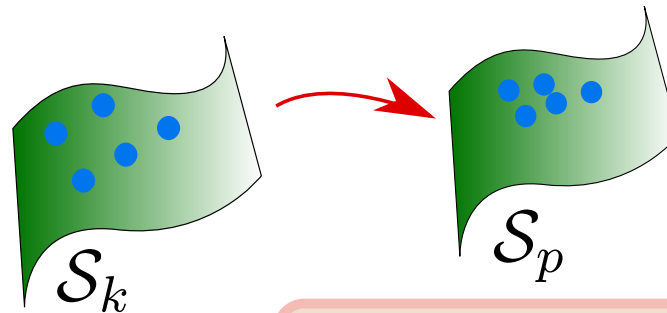


Challenge

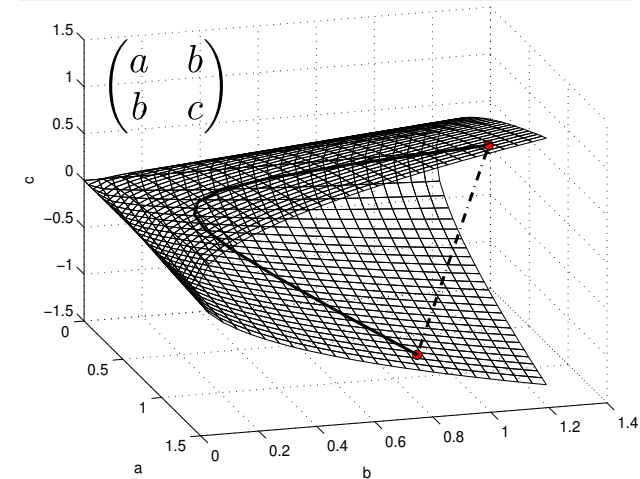
Dimensionality grows as n^2



Dimensionality Reduction



SPD matrices form a **Riemannian Manifold**



PCA disregards this geometry

Proposal:

intrinsic PCA for **SPD matrices** which retains their **Riemannian structure**