Random matrix-improved kernels for large dimensional spectral clustering

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Leveraging on recent random matrix advances in the performance analysis of kernel methods for classification and clustering, this article proposes a new family of kernel functions theoretically largely outperforming standard kernels in the context of asymptotically large and numerous datasets. These kernels are designed to discriminate statistical means and covariances across data classes at a theoretically minimal rate (with respect to data size). Applied to spectral clustering, we demonstrate the validity of our theoretical findings both on synthetic and real-world datasets (here, the popular MNIST database as well as EEG recordings on epileptic patients).

Références

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