CUR Decompositions and Subspace Clustering

Abstract: The Subspace Clustering Problem is the task of partitioning data which comes from the union of low-dimensional linear or affine subspaces of an ambient high-dimensional Euclidean space. The low-rank structure of a matrix of data from such a union of subspaces allows for a variety of techniques which can approach this problem successfully as well as in a computationally efficient manner. This talk will discuss how a variety of low-rank matrix factorizations can achieve the clustering task under ideal assumptions, and how this theory can be extended to provide flexible algorithms for subspace clustering in practice. The main technical tool will be the CUR decomposition for matrices, and we will discuss some further work on this decomposition including a characterization theorem as well as perturbation analysis. This is joint work with Akram Aldroubi, Longxiu Huang, Bugra Koku, and Ali Sekmen.

Short Bio: Dr. Keaton Hamm is a native Texan and 3 times an Aggie with a B.S. in Chemical Engineering and B.S. and Ph.D. in Mathematics from Texas A&M. He was a Postdoc at Vanderbilt University from 2015-2018, and is currently a Postdoctoral Research Associate at the University of Arizona in the NSF supported TRIPods program (Transdisciplinary Research In Principles Of Data Science). His research interests broadly speaking are in applying Analysis tools to problems in dimensionality reduction and structured approximation of large-scale data which may take the form of graphs, matrices, or spaces of smooth signals.

Refreshments before the talk and socializing following the talk
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