Numerical Analysis and Scientific Computing Seminar

Geometric and Statistical Approaches to Shallow and Deep Clustering

James M. Murphy
Tufts University

Abstract: We propose approaches to unsupervised clustering based on data-dependent distances and dictionary learning. By considering metrics derived from data-driven graphs, robustness to noise and ambient dimensionality is achieved. Connections to geometric analysis, stochastic processes, and deep learning are emphasized. The proposed algorithms enjoy theoretical performance guarantees on flexible data models and in some cases guarantees ensuring quasilinear scaling in the number of data points. Applications to image processing and computational chemistry will be shown, demonstrating state-of-the-art empirical performance.

Friday, November 5, 2021, 12:30 pm
Mathematics and Science Center: MSC W201

Mathematics
Emory University