University of California, Irvine
Statistics Seminar

Can We Hear the Structure of the Data?

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(Bldg. #314 on campus map)

While much of modern data is high dimensional, information that is useful to humans is low dimensional. The progress of data science depends on how well we can extract informative, low-dimensional structures from data, and what we can learn from them. Can we even quantify structure? When and how can we find the informative low-dimensional structures? Can we do this algorithmically fast and theoretically sound? Can we envision systematic approaches that are applicable across different types of data and work well even if we do not know what kind of structures we are looking for? I am going to propose a far reaching program in high dimensional statistics, which unifies and advances several areas where major successes were obtained in the past decade, including structured regression, compressed sensing, clustering, matrix completion, quantization, and phase retrieval. The successful development of this program may shed light on some statistical problems where theoretical analysis is currently scarce, most notably in deep learning.