



THE UNIVERSITY OF CHICAGO

COMPUTATIONAL AND APPLIED MATHEMATICS COLLOQUIUM

HONGKAI ZHAO

Department of Mathematics
University of California, Irvine

Intrinsic Complexity and its Scaling Law: From Approximation of Random Vectors and Random Fields to High Frequency Waves

THURSDAY, November 15, 2018, at 4:00 PM
Jones 226, 5747 South Ellis Avenue

ABSTRACT

We characterize the intrinsic complexity of a set in a metric space by the least dimension of a linear space that can approximate the set to a given tolerance. This is dual to the characterization using Kolmogorov n -width, the distance from the set to the best n -dimensional linear space. We study the approximation of random vectors (via principal component analysis a.k.a. singular value decomposition) and random fields (via Karhunen–Loève expansion) as well as the approximate separability of the Green’s function of the Helmholtz equation for high frequency waves. We provide lower bounds and upper bounds for the intrinsic complexity and its asymptotic scaling law.



Organizers:

Daniel Sanz-Alonso, Department of Statistics, sanzalonso@uchicago.edu
CAM Colloquium URL: <https://cam.uchicago.edu/seminars/index.shtml>.

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