

Meeting: 1000, Albuquerque, New Mexico, SS 15A, Special Session on Probabilistic and Geometric Methods in Learning Theory

1000-60-82 **Roman Vershynin*** (vershynin@math.ucdavis.edu), Department of Mathematics, Davis, CA 95616. *Vapnik-Chervonenkis combinatorics of real-valued classes of functions: entropy and empirical processes.*

We solve two basic conjectures regarding the extension of Vapnik-Chernovenkis combinatorics from Boolean to general real-valued classes of functions. 1. The uniform entropy of a function class is equivalent to its combinatorial (Pollard, fat-shattering) dimension under a minimal regularity. 2. A function class satisfies the uniform Central Limit Theorem (i.e. is uniform Donsker) if the square root of its combinatorial dimension is integrable. These results solve two problems of M.Talagrand. They are based on a new sharp combinatorial bound for the metric entropy of sets in R^n . This work is joint with S.Mendelson and M.Rudelson. (Received August 17, 2004)