High-dimensional linear models: a random matrix perspective. (English) Zbl 1472.62080

Summary: Professor C. R. Rao’s [Linear statistical inference and its applications. New York-London-Sydney: John Wiley and Sons, Inc. (1965; Zbl 0137.36203)] is a classic that has motivated several generations of statisticians in their pursuit of theoretical research. This paper looks into some of the fundamental problems associated with linear models, but in a scenario where the dimensionality of the observations is comparable to the sample size. This perspective, largely driven by contemporary advancements in random matrix theory, brings new insights and results that can be helpful even for solving relatively low-dimensional problems. This overview also brings into focus the fundamental roles played by the eigenvalues of large covariance-type matrices in the theory of high-dimensional multivariate statistics.

MSC:
62H12 Estimation in multivariate analysis
62J05 Linear regression; mixed models
62J10 Analysis of variance and covariance (ANOVA)
60B20 Random matrices (probabilistic aspects)

Keywords: multivariate statistics; linear models; random matrix theory

Software: robustbase

Full Text: DOI

References:


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