Abstract: Statistical inference is of fundamental importance and yet challenging in high-dimensional and functional data analysis. In response to the challenge, a set of powerful bootstrap-based procedures are developed for high-dimensional and functional ANOVA, such as hypothesis testing for the mean function, coefficient function of the varying coefficient model, and slope function of the functional linear model. The validity and consistency of the proposed procedures are established, and convergence rates are derived. In particular, we uncover a theoretical distinction between FPCA-based estimation and inference for the slope function. The proposed procedures are shown to enjoy excellent numeric performance, especially when the sample size is limited while the signal is relatively weak.

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