Rank-Based Analyses of Multivariate Linear Models with Applications to Profile Analysis

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Abstract

In this talk, we present several new rank-based procedures for the analysis of multivariate linear models. One procedure is an affine equivariant estimate for the regression coefficient matrix of the multivariate linear model. These estimates are based on a transformation and retransformation technique that uses Tyler's (1987) M-estimator of scatter. The proposed estimates are obtained by retransforming the componentwise rank-based estimate due to Davis and McKean (1993) and a componentwise generalized rank estimate. This procedure is for the general linear multivariate model. For repeated measure type responses, we discuss a rank-based GEE procedure and a rank-based procedure which utilizes Arnold's (1981) initial transformation of the responses. Asymptotic theory is presented for all the procedures. We then compare the methods over a simulation study on profile models.