High Breakdown Point Multivariate M-Estimation

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Abstract: In this talk, a general study of the properties of the M-estimates of multivariate location and scatter with auxiliary scale proposed in Tatsuoka and Tyler (2000) is presented. This study provides a unifying treatment for some of the high breakdown point methods develop for multivariate statistics, as well as a unifying framework for comparing these methods. The multivariate M-estimates with auxiliary scale include as special cases the minimum volume ellipsoid estimates [Rousseeuw (1985)], the multivariate S-estimates [Davies (1987)], the multivariate constrained M-estimates [Kent and Tyler (1996)], and the recently introduced multivariate MM-estimates [Tatsuoka and Tyler (2000)].

   The results obtained for the multivariate MM-estimates, such as its breakdown point, its influence function and its asymptotic distribution, are entirely new. The breakdown points of the M-estimates of multivariate location and scatter for fixed scale are also derived. This generalizes the results on the breakdown points of the univariate redescending M-estimates of location with fixed scale given by Huber (1984).

References

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My abstract fits best to topic numbers:

- 18. Robust covariance
- 14. Multivariate methods
- 8. Efficiency and robustness

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