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Title:

**Robust multivariate methods with an application to allometry.**

Abstract:

Classical multivariate methods (principal component analysis, multivariate regression, canonical correlation analysis, etc.) are based on the concepts of location vector and scatter matrix, and the estimation is done using the regular sample mean vector and sample covariance matrix. Such methods are optimal under the assumption of multivariate normality, but have low efficiency in case of heavy-tailed distributions and are highly sensitive to outlying observations. A simple way to derive robust competitors to standard multivariate methods is to use some robust location vector and scatter matrix estimates instead of classical ones. In this talk, we apply robust principal component analysis to allometry. Allometry is a field of biology, where one studies the relation between size and its biological consequences. As the aim is to summarize the relationship between two variables, this can be easily done via principal component vectors. We will demonstrate that the methods utilizing Huber's M-estimators are simple, highly efficient and robust against bivariate contamination. We can also make accurate inferences even from very small samples.