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Reduction of regression models under symmetry. (English) [Zbl 1012.62077]


Summary: When regression methods for collinear data are equivariant under the group of rotations in the $x$-space, it is argued that the regression parameters along the orbits of the group can be estimated in an optimal way by a Pitman-type estimator. When the space is high-dimensional, any reduction in the regression model must therefore take place via the group’s orbit index. The solution which emerges from this, is closely related to the population version of the chemometricians’ partial least squares regression. Estimation under the reduced model is briefly discussed, as is model reduction in the corresponding classification problem.

For the entire collection see [Zbl 0982.00050].

MSC:

62J99 Linear inference, regression
20G99 Linear algebraic groups and related topics
62H99 Multivariate analysis
62H30 Classification and discrimination; cluster analysis (statistical aspects)

Keywords:

collinearity; group orbits; model reduction; multiple regression; partial least squares regression; Pitman estimator; rotational symmetry