

## Multivariate Regression L-Estimation

Jan Picek\*, Jana Jurečková and Pranab K. Sen

*Technical University of Liberec, Czech Republic [jan.picek@tul.cz](mailto:jan.picek@tul.cz)  
Charles University in Prague, Czech Republic, [jurecko@karlin.mff.cuni.cz](mailto:jurecko@karlin.mff.cuni.cz)  
University of North Carolina at Chapel Hill, USA, [pkxen@bios.unc.edu](mailto:pkxen@bios.unc.edu)*

The theoretical foundation of multivariate statistical estimation has been fortified by notion of affine-equivariance and its dual affine-equivariance (AE), which are the natural generalizations of univariate translation-scale equivariance and invariance notion. In the univariate case, conventional R-, L- and M-estimators have robustness properties tuned to the class of underlying distributions and the extent of desired (local or global) robustness wherein influence curves, break-down points etc. provide the desired conceptual measures, and these have been studied extensively in the literature. Unfortunately, these coordinate-wise robust estimators may not have AE property in a real multivariate problem. On the other hand, the assumption of the AE class of estimators may generally lead to compromise of robustness.

The aim of present contribution is to describe smooth affine-equivariant L-estimator of vector of intercept parameters as a possible iterative construction of an affine-equivariant of general sample spatial L-estimator. The properties of this estimator are illustrated on simulated data.

**Key Words:** Affine-equivariance, Elliptically symmetric distribution, multivariate regression model, smooth affine-equivariant L-estimator