Replacing Cluttered Scatterplots With Augmented Convex Hull Plots

Maja Pohar, Gaj Vidmar
Institute of Biomedical Informatics
University of Ljubljana
maja.pohar@mf.uni-lj.si

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Abstract

The presentation of multi-group scatter plots can be often obscured by the visual clutter. A way to get more information from such plot is to replace the scatterplot points with convex hulls. Thus space is gained for vizualization of descriptive statistics with error bars or confidence ellipses within the convex hulls. Bivariate density plots might be used instead of convex hulls in the presence of outliers. An informative addition to the plot is calculation of the area of a convex hull divided by corresponding group size — a bivariate dispersion measure weighting all deviations from the center equally. Marginal distributions can be depicted on the sides of the main plot in the established ways.
The limited possibilities for producing such plots in existing software have led us to implement these graphs in R - we introduce the function *chplot* that automatizes this kind of plots. Following the standard plotting options we have devised a function that makes the calculations needed to produce a sensible plot of the data, but at the same time allows the user to change any of the options at his will. We include some examples of the usage based on the Iris dataset and daily statistical consulting practice.