Robust Correlation Applied to Locating Landmarks

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Abstract

In our work with images of human faces (joint work with P.L. Davies), similarity between two images must be measured in a robust way. Some of suitable correlation measures are based on robust regression (least trimmed squares or least weighted squares), other examples include directly the maximal weighted correlation coefficient over all permutations of the weights.

Such methods are computationally intensive and can be only approximated. We generalize the algorithm of Kalina (2003) to approximate the minimum of the weighted loss function in both regression and correlation context.

In an example we find a better approximation to the least trimmed squares estimator than software packages R and S-Plus. Then we use the methods to automatically search for the vertical axis of symmetry in human faces or to locate the eyes using templates.

References

J. Kalina (2003). Autocorrelated disturbances of robust regression. In Fournier B. et al., eds., *Proceedings EYSM 2003*, pp. 65-72, Ovronnaz, Switzerland.