Collaborative Sliced Inverse Regression

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Sliced Inverse Regression (SIR) is an effective method for dimensionality reduction in high-dimensional regression problems (Li, 1991). However the method has requirements on the distribution of the predictors that are hard to check because they depend on unobserved variables (Zhu, 2010). It has been shown that if the distribution of the predictors is elliptical then these requirements are satisfied. In case of mixture models the ellipticity is violated and in addition there is no assurance of a single underlying regression model among the different components. Our approach clusterizes the predictors space to force the condition to hold on each cluster and includes a merging technique to look for different underlying models in the data. A real applications where the predictor space X is composed of spectral characteristics of galaxies is discussed.

The talk is based on a joint work with Stephane Girard and Jocelyn Chanussot.

References

Li, K.-C. (1991). Sliced inverse regression for dimension reduction. *Journal of the American Statistical Association*, *86*(414), 316 – 327.

Zhu, L.-P. (2010). Extending the scope of inverse regression methods in sufficient dimension reduction. *Communications in Statistics — Theory and Methods*, *40*(1), 84 – 95.