



Sparse Regression Incorporating Graphical Structure Among Predictors

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With the abundance of high dimensional data in various disciplines, sparse regularized techniques are very popular these days. In this talk, we use the structure information among predictors to improve sparse regression models. Typically, such structure information can be modeled by the connectivity of an undirected graph. Most existing methods use this graph edge-by-edge to encourage the regression coefficients of corresponding connected predictors to be similar. However, such methods may require expensive computation when the predictor graph has many edges. Furthermore, they do not directly utilize the neighborhood information. In this work, we incorporate the graph information node-by-node instead of edge-by-edge. Our proposed method is quite general and it includes adaptive Lasso, group Lasso and ridge regression as special cases. Both theoretical study and numerical study demonstrate the effectiveness of the proposed method for simultaneous estimation, prediction and model selection. This talk is based on joint work with Guan Yu at UNC-Chapel Hill.

Keywords: Graph; Model selection; Prediction; Sparse regression.