MAY 02, 2019

1 Adddditive Partial Linear Model

$$y_i = \beta_0 + \sum_{l=1}^{L} f_l(X_l) + \sum_{k=1}^{K} \beta_k Z_k + \epsilon_i, \;\; \epsilon_i \overset{\text{iid}}{\sim} N(0, \sigma^2), \;\; i = 1, \ldots, n$$

- $\mathbf{Y} = \{y_1, \ldots, y_n\}'$: dependents variable
- $\mathbf{X} = \{X_1, \ldots, X_L\}'$: non-parametirc components
- $\mathbf{Z} = \{Z_1, \ldots, Z_K\}'$: parametric components
- $f_1, \ldots, f_L$: unknown smooth functions
- β_0 : intercept
- $\beta_1, \ldots, \beta_K$: coefficients

Standarized model is ,

$$\mathbf{Y} - \bar{y}\mathbf{1}_n = \mathbf{b}^*(\mathbf{X}) + \mathbf{Z}^*\beta + \epsilon$$

2 Varialbe selection via Local FDR

Let posterior probaility of include jth component be p_j, Conduct MCMC simulation and we can notice which variables are used to bulid the model in each iteration

$$p_j = \frac{1}{K} \sum_{k=1}^{K} I(\xi_i \in \mathbf{X}^{(k)})$$

ξ_i means jth covariate and $\mathbf{X}^{(k)}$ represent the set of covariates used to the build the model in the kth iteration.