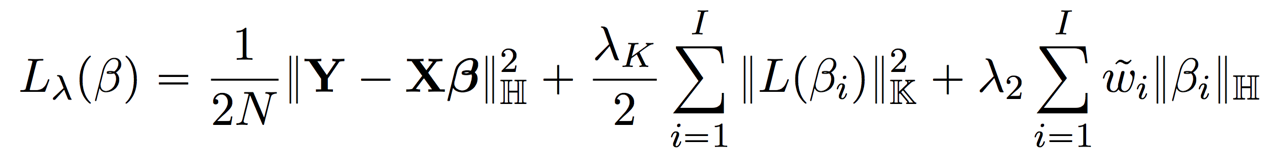
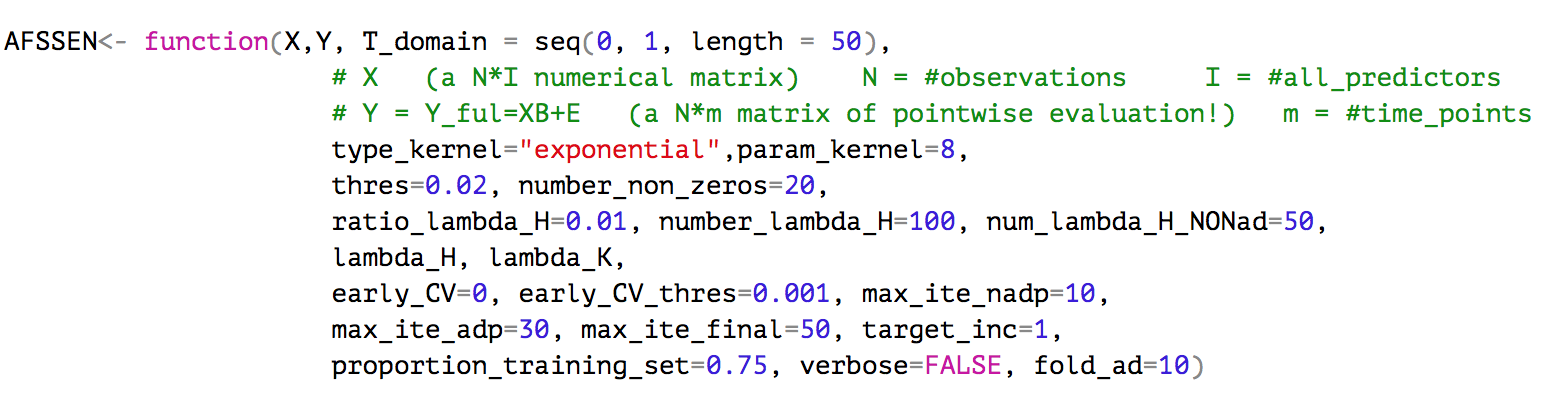
**Main parameters in using AFFSEN function**

Use the AFFSEN function to find significant predictors and estimate a smooth version of them in a high dimensional case. We have option to control sparsity and smoothness separately with using two penalty parameters and . We aim to estimate a smooth version of s minimize the following target function.



The following AFFSEN function helps us to estimate the and find the significant predictors.



In the following table you can find the functionality of each parameters:

|  |  |  |
| --- | --- | --- |
|  | functionality | Details |
| X | Numerical design matrix | It should be a N\*I matrix  N= #observations ; I = #predictors |
| Y | Matrix of pointwise evaluation for observations on T\_domain | It should be a N\*m matrix. |
| T\_domain | Time domain for evaluation of Y and generating kernel | Default : T\_domain = seq(0,1,m=50) |
| type\_kernel | Type of kernel | ‘exponential’, ‘gaussian’, ‘sobolev’ |
| param\_kernel | Kernel parameter | In all types, the time domain is seq(0,1,50) |
| thres | Stopping criteria:  beta increment threshold |  |
| number\_non\_zeros | Stopping Criteria:  Kill switch; number of nonzero predictors |  |
| ratio\_lambda\_H |  |  |
| number\_lambda\_H | Generate number of log-equally spaced in |  |
| num\_lambda\_H\_NONad | Number of in non-adaptive step |  |
| lambda\_H | You have option to insert a vector of | If you want to make the log-equally spaced by above parameters, just set lambda\_H=numeric() |
| lambda\_K | Vector of |  |
| early\_CV | 0 or 1 : applying the “early\_CV\_thres” stopping criteria or not. |  |
| early\_CV\_thres | Stopping Criteria:  Breaking point in CV plot. |  |
| max\_ite\_nadp | Stopping Criteria:  Maximum iteration of coordinate descent alg. in non-adaptive step |  |
| max\_ite\_adp | Stopping Criteria:  Maximum iteration of coordinate descent alg. in adaptive step |  |
| max\_ite\_final | Stopping Criteria:  Maximum iteration of coordinate descent alg. for the optimum and |  |
| target\_inc | Stopping Criteria:  0 or 1 : if target function is increased, stop |  |
| proportion\_training\_set | Proportion of training set for estimation in non-adaptive step. |  |
| fold\_ad | Number of fold for using CV in adaptive steps to find optimum and and then estimation. |  |