BOOTSTRAP RESULTS

CLMENT CARRIER

Bootstrap

```r
library(knitr)
library(glmnet)
library(MASS)
library(xtable)
require(ggplot2)
```

```r
source('../../laurent/lasso.R')
source('../../Functions/RW.R')
source('../../Functions/fun.R')
source('../../Functions/lahiri.R')
source('../../Functions/lahiriboot.R')
source('../../Functions/lahiriboot2.R')
source('../../Functions/AR1.R')
source('../../Functions/edfAR1.R')
source('../../Functions/edfiid4.R')
source('../../Functions/edfiid1.R')
source('../../Functions/iid1.R')
source('../../Functions/iid5.R')
source('../../Functions/iid10.R')
```

We simulate the data by choosing, the sparsity of the true parameters (number of non zero coefficient), the number of covariates, the number of observations and the nature of the noise (here we choose iid N(0,1)).

Table 1. Simulation Result

		iid								AR							
Model	X.p.n.	lenght	cov1	cov2	cov3	cov4	fn	biais1	biais2	lenght2	cov1.1	cov2.1	cov3.1	cov4.1	fn2	biais1.1	biais2.1
1	(10,100)	0.418	0.914	0.528	1.000	1.000	0.000	0.148	0.043	0.321	0.985	0.480	1.000	0.000	0.000	0.191	0.013
2	(50,100)	0.427	0.777	0.479	1.000	0.000	0.000	0.091	0.112	0.322	0.960	0.633	1.000	0.000	0.000	0.136	0.038
3	(120,100)	0.712	0.761	0.027	1.000	0.000	139.000	0.478	-0.004	0.301	0.987	0.467	1.000	0.000	0.000	0.229	-0.017
4	(150,100)	0.471	0.874	0.109	1.000	0.000	12.000	0.303	0.048	0.329	0.960	0.223	1.000	0.000	0.000	0.318	-0.056

In the following one, we increase the number of nonzero parameter.

Table 2. Simulation Result

		iid 5								iid 10							
Model	X.p.n.	lenght	cov1	cov2	cov3	cov4	fn	biais1	biais2	lenght2	cov1.1	cov2.1	cov3.1	cov4.1	fn2	biais1.1	biais2.1
1	(10,100)	0.450	0.877	0.558	1.000	0.600	0.000	0.200	-0.055	0.365	0.964	0.898	1.000	0.900	0.000	0.024	0.000
2	(50,100)	0.465	0.788	0.085	1.000	0.000	24.000	0.269	0.101	0.947	0.066	0.036	1.000	0.200	8012.000	0.302	0.696
3	(120,100)	0.899	0.290	0.059	1.000	0.000	2488.000	0.351	0.410	0.162	0.924	0.000	1.000	0.000	8999.000	1.071	-0.035
4	(150,100)	0.901	0.476	0.086	1.000	0.200	1246.000	0.403	0.250	0.127	0.937	0.002	1.000	0.000	9000.000	1.017	-0.024

Then we compute the method used by lahiri (On the residual empirical process based on the ALASSO in high dimensions and its functional oracle property). In this paper,

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Lahiri uses the ALASSO estimator and shows that the empirical distribution of estimated residual behaves approximately as a gaussian noise. He then deduces a confidence band of prediction of the variable of interest (y) based on the empirical distribution of the residual.

Table 3. Simulation Result

		iid1		iid5		AR	
Model	X.pn.	coverage	lenght	coverage.1	lenght.1	coverage.2	lenght.2
1	(10,100)	0.935	3.745	0.942	3.770	0.923	3.664
2	(50,100)	0.948	3.822	0.924	3.740	0.911	3.671
3	(120,100)	0.926	3.708	0.979	4.149	0.948	4.169
4	(200,100)	0.888	3.536	0.975	4.130	0.941	4.002