

Result Table

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We tested five methods, namely

- the Lasso
- our method applied to the Lasso (“olasso”)¹
- stepwise
- our method applied to stepwise (“ostepwise”)¹
- SHIM

on 6 conditions, which are displayed in Table 1 below.

All conditions share the same number of main and interaction effects, i.e. 10 and 45 respectively. The numbers of significant main and interaction effects are different among conditions, so are the coefficients of those significant main and interaction effects. We also vary the standard deviations of error terms (*sigma*) in order to form different signal-to-noise ratios.

Each method has 100 simulation rounds except for SHIM, which has 20 rounds. Methods contrast results regarding sensitivities (“se”) and specificities (“sp”) under various conditions are displayed in Table 1, too.

Discussion:

- Consider conditions 5 and 6? More?
- Possible disadvantages of SHIM
 1. Different sets of parameters (λ_1, λ_2) affect performance, i.e. not stable.
 2. Condition 4 when *sigma* is large (signal-to-noise ratio small).
 3. “Warning: the whole iteration did not converge..”

¹Names might be changed.

²20 rounds. (λ_1, λ_2) : $\exp(\text{seq}(5, 10, 0.5)) \times 0.1 \sim 0.9$

³For example, x_1 through x_4 are significant, while x_1x_4 and x_3x_4 are not significant.

Table 1: Methods contrast results among 6 conditions

Condition	1	2	3	4	5	6
# Main	4	4	3	4	7	4
# 2FI	6	6	3	6	21	4 ³
Coef.Main	0.1	1	1	1	1	1
Coef.2FI	10	1	5	1	5	5
sigma	12	8	8	20	8	8
se.lasso (std)	0.705 (0.097)	0.624 (0.250)	0.843 (0.144)	0.117 (0.148)		
se.lasso (std)	0.999 (0.010)	0.694 (0.217)	0.993 (0.033)	0.258 (0.211)		
se.step (std)	0.671 (0.074)	0.581 (0.170)	0.813 (0.147)	0.256 (0.138)		
se.ostep (std)	1.000 (0.000)	0.722 (0.131)	0.998 (0.017)	0.503 (0.157)		
se.SHIM ² (std)	1.000 (0.000)	0.790 (0.255)	1.000 (0.000)	0.180 (0.240)		
sp.lasso (std)	0.733 (0.096)	0.808 (0.120)	0.780 (0.114)	0.943 (0.080)		
sp.lasso (std)	0.614 (0.107)	0.781 (0.134)	0.723 (0.118)	0.892 (0.112)		
sp.step (std)	0.807 (0.070)	0.811 (0.068)	0.819 (0.061)	0.822 (0.063)		
sp.ostep (std)	0.727 (0.081)	0.730 (0.078)	0.729 (0.077)	0.735 (0.080)		
sp.SHIM ² (std)	0.950 (0.144)	0.917 (0.099)	0.983 (0.035)	0.957 (0.079)		