simulation table for proposed GCTA

Simulation setup

The key factors are

1. Distribution
2. Covariance matrix
   - Note that if the covariance matrix is I, which means uncorrlated data and also indicates Independence in our paper.
   - we also use the the sample vairance matrix calculated from the real PCB data
3. Decorrelation method
   - SVD, dimension reduction before SVD and none
4. main and interaction coefficients
   - $\beta_m = \beta_{mf} + \beta_{mr}$ where $\beta_{mf} \sim N(0, \sigma_{mf}^2)$ and $\beta_{mr} \sim N(0, \sigma_{mr}^2)$ if $\sigma_{mr}^2 = 0$ means main effect is fixed, otherwise it's random
   - $\beta_i = \beta_{if} + \beta_{ir}$ where $\beta_{if} \sim N(0, \sigma_{if}^2)$ and $\beta_{ir}^2 \sim N(0, \sigma_{ir}^2)$ if $\sigma_{ir}^2 = 0$ means internaction effect is fixed, otherwise it's random. Besides, if $\sigma_{if}^2 = 0$ then means there is no interaction effect
5. Sample size = $\{200, \ldots, 900\}$ and $p = 33$
6. Total Iteration times: 200

Table 1: Fixed cases

ID	Dist	Corr_stru	decorr	main_fixed	main_random	inter_random	inter_fixed	estimation_model	finished_date
1	Normal	I	SVD	0.5	0	0	0.0	main	
2	Normal	I	SVD	0.5	0	0	0.0	main /& interaction	
3	Normal	I	SVD	0.5	0	0	0.0	total	
4	Normal	I	SVD	0.5	0	0	0.1	main	
5	Normal	I	SVD	0.5	0	0	0.1	main /& interaction	
6	Normal	I	SVD	0.5	0	0	0.1	total	
7	Normal	pcb	SVD	0.5	0	0	0.0	main	
8	Normal	pcb	SVD	0.5	0	0	0.0	main /& interaction	
9	Normal	pcb	SVD	0.5	0	0	0.0	total	
10	Normal	pcb	SVD	0.5	0	0	0.1	main	
11	Normal	pcb	SVD	0.5	0	0	0.1	main /& interaction	
12	Normal	pcb	SVD	0.5	0	0	0.1	total	
13	Chi-square	I	SVD	0.5	0	0	0.0	main	
14	Chi-square	I	SVD	0.5	0	0	0.0	main /& interaction	
15	Chi-square	I	SVD	0.5	0	0	0.0	total	
16	Chi-square	I	SVD	0.5	0	0	0.1	main	
17	Chi-square	I	SVD	0.5	0	0	0.1	main /& interaction	
18	Chi-square	I	SVD	0.5	0	0	0.1	total	
19	Chi-square	pcb	SVD	0.5	0	0	0.0	main	
20	Chi-square	pcb	SVD	0.5	0	0	0.0	main /& interaction	
21	Chi-square	pcb	SVD	0.5	0	0	0.0	total	
22	Chi-square	pcb	SVD	0.5	0	0	0.1	main	
23	Chi-square	pcb	SVD	0.5	0	0	0.1	main /& interaction	
24	Chi-square	pcb	SVD	0.5	0	0	0.1	total	
25	PCB	pcb	SVD	0.5	0	0	0.0	main	
26	PCB	pcb	SVD	0.5	0	0	0.0	main /& interaction	
27	PCB	pcb	SVD	0.5	0	0	0.0	total	
28	PCB	pcb	SVD	0.5	0	0	0.1	main	
29	PCB	pcb	SVD	0.5	0	0	0.1	main /& interaction	
30	PCB	pcb	SVD	0.5	0	0	0.1	total	
31	PCB	pcb	dim_SVD	0.5	0	0	0.0	main	
32	PCB	pcb	dim_SVD	0.5	0	0	0.0	main /& interaction	
33	PCB	pcb	dim_SVD	0.5	0	0	0.0	total	
34	PCB	pcb	dim_SVD	0.5	0	0	0.1	main	
35	PCB	pcb	dim_SVD	0.5	0	0	0.1	main /& interaction	
36	PCB	pcb	dim_SVD	0.5	0	0	0.1	total	

Table 2: random cases

ID	Dist	Corr_stru	decorr	main_fixed	main_random	inter_random	inter_fixed	estimation_model	finished_date
1	Normal	I	SVD	0.25	0.25	0.00	0.00	main	
2	Normal	I	SVD	0.25	0.25	0.00	0.00	main /& interaction	
3	Normal	I	SVD	0.25	0.25	0.00	0.00	total	
4	Normal	I	SVD	0.25	0.25	0.00	0.10	main	
5	Normal	I	SVD	0.25	0.25	0.00	0.10	main /& interaction	
6	Normal	I	SVD	0.25	0.25	0.00	0.10	total	
7	Normal	I	SVD	0.25	0.25	0.05	0.05	main	
8	Normal	I	SVD	0.25	0.25	0.05	0.05	main /& interaction	
9	Normal	I	SVD	0.25	0.25	0.05	0.05	total	
10	Normal	pcb	SVD	0.25	0.25	0.00	0.00	main	
11	Normal	pcb	SVD	0.25	0.25	0.00	0.00	main /& interaction	
12	Normal	pcb	SVD	0.25	0.25	0.00	0.00	total	
13	Normal	pcb	SVD	0.25	0.25	0.00	0.10	main	
14	Normal	pcb	SVD	0.25	0.25	0.00	0.10	main /& interaction	
15	Normal	pcb	SVD	0.25	0.25	0.00	0.10	total	
16	Normal	pcb	SVD	0.25	0.25	0.05	0.05	main	
17	Normal	pcb	SVD	0.25	0.25	0.05	0.05	main /& interaction	
18	Normal	pcb	SVD	0.25	0.25	0.05	0.05	total	
19	Chi-square	I	SVD	0.25	0.25	0.00	0.00	main	
20	Chi-square	I	SVD	0.25	0.25	0.00	0.00	main /& interaction	
21	Chi-square	I	SVD	0.25	0.25	0.00	0.00	total	
22	Chi-square	I	SVD	0.25	0.25	0.00	0.10	main	
23	Chi-square	I	SVD	0.25	0.25	0.00	0.10	main /& interaction	
24	Chi-square	I	SVD	0.25	0.25	0.00	0.10	total	
25	Chi-square	I	SVD	0.25	0.25	0.05	0.05	main	
26	Chi-square	I	SVD	0.25	0.25	0.05	0.05	main /& interaction	
27	Chi-square	I	SVD	0.25	0.25	0.05	0.05	total	
28	Chi-square	pcb	SVD	0.25	0.25	0.00	0.00	main	
29	Chi-square	pcb	SVD	0.25	0.25	0.00	0.00	main /& interaction	
30	Chi-square	pcb	SVD	0.25	0.25	0.00	0.00	total	
31	Chi-square	pcb	SVD	0.25	0.25	0.00	0.10	main	
32	Chi-square	pcb	SVD	0.25	0.25	0.00	0.10	main /& interaction	
33	Chi-square	pcb	SVD	0.25	0.25	0.00	0.10	total	
34	Chi-square	pcb	SVD	0.25	0.25	0.05	0.05	main	
35	Chi-square	pcb	SVD	0.25	0.25	0.05	0.05	main /& interaction	
36	Chi-square	pcb	SVD	0.25	0.25	0.05	0.05	total	
37	PCB	pcb	SVD	0.25	0.25	0.00	0.00	main	
38	PCB	pcb	SVD	0.25	0.25	0.00	0.00	main /& interaction	
39	PCB	pcb	SVD	0.25	0.25	0.00	0.00	total	
40	PCB	pcb	SVD	0.25	0.25	0.00	0.10	main	
41	PCB	pcb	SVD	0.25	0.25	0.00	0.10	main /& interaction	
42	PCB	pcb	SVD	0.25	0.25	0.00	0.10	total	
43	PCB	pcb	SVD	0.25	0.25	0.05	0.05	main	
44	PCB	pcb	SVD	0.25	0.25	0.05	0.05	main /& interaction	
45	PCB	pcb	SVD	0.25	0.25	0.05	0.05	total	
46	PCB	pcb	dim_SVD	0.25	0.25	0.00	0.00	main	
47	PCB	pcb	dim_SVD	0.25	0.25	0.00	0.00	main /& interaction	
48	PCB	pcb	dim_SVD	0.25	0.25	0.00	0.00	total	
49	PCB	pcb	dim_SVD	0.25	0.25	0.00	0.10	main	
50	PCB	pcb	dim_SVD	0.25	0.25	0.00	0.10	main /& interaction	
51	PCB	pcb	dim_SVD	0.25	0.25	0.00	0.10	total	
52	PCB	pcb	dim_SVD	0.25	0.25	0.05	0.05	main	
53	PCB	pcb	dim_SVD	0.25	0.25	0.05	0.05	main /& interaction	
54	PCB	pcb	dim_SVD	0.25	0.25	0.05	0.05	total	