Numerical Results

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This is the RMarkdown file to reproduce the numerical results of the work

> Rui Tuo, Shiyuan He, Arash Pourhabib, Yu Ding and Jianhua Z. Huang (2021+). Improved Estimation of High-dimensional AdditiveModels Using Subspace Learning.

This RMarkdown file runs on the cached RData files in the `./data` folder. Follow the instructions of the `readme.md` file to reproduce the cached RData files.

Table 1–4 correspond to the tables in the simulation section of the manuscript.

Table 1: Simulation 1 (Param-Exp model). Comparison of methods with the cheap code (CC). The mean (and SE) of the L_2-loss and of the width and average coverage rate (CR) for the level 90%, 95% and 99% confidence intervals.

Code	Method	L_2-loss	90%		95%		99%	
			Width	CR	Width	CR	Width	CR
CC	Const	2.200	2.367	0.123	2.820	0.147	3.706	0.193
		(0.025)	(0.030)	(0.001)	(0.036)	(0.002)	(0.047)	(0.002)
	Param-Exp	0.061	0.533	0.882	0.635	0.928	0.834	0.973
		(0.004)	(0.007)	(0.024)	(0.009)	(0.018)	(0.011)	(0.012)
	Param-Quad	0.085	0.631	0.843	0.752	0.898	0.989	0.966
		(0.004)	(0.009)	(0.020)	(0.010)	(0.017)	(0.014)	(0.010)
	RKHS-Cubic	0.119	0.971	0.901	1.156	0.948	1.520	0.987
		(0.004)	(0.015)	(0.012)	(0.018)	(0.008)	(0.024)	(0.003)
	Baysian	0.265	2.485	0.958	2.959	0.983	3.859	0.997
		(0.011)	(0.033)	(0.006)	(0.039)	(0.004)	(0.048)	(0.001)

Table 2: Simulation 2 (Param-Quad model). Comparison of methods with the cheap code (CC). The mean (and SE) of the L_2-loss and of the width and average coverage rate (CR) for the level 90%, 95% and 99% confidence intervals.

Code	Method	L_2-loss	90%		95%		99%	
			Width	CR	Width	CR	Width	CR
CC	Const	0.278	0.073	0.197	0.087	0.240	0.114	0.330
		(0.001)	(0.001)	(0.004)	(0.001)	(0.005)	(0.001)	(0.008)
	Param-Exp	0.095	0.080	0.188	0.095	0.225	0.125	0.299
		(0.000)	(0.001)	(0.003)	(0.001)	(0.004)	(0.002)	(0.005)
	Param-Quad	0.010	0.048	0.890	0.057	0.938	0.075	0.987
		(0.001)	(0.001)	(0.020)	(0.001)	(0.015)	(0.001)	(0.006)
	RKHS-Cubic	0.018	0.073	0.901	0.087	0.945	0.114	0.982
		(0.001)	(0.002)	(0.011)	(0.002)	(0.008)	(0.002)	(0.004)
	Baysian	0.026	0.111	0.938	0.133	0.955	0.174	0.974
		(0.001)	(0.001)	(0.006)	(0.001)	(0.004)	(0.001)	(0.002)

Table 3: Simulation 3. Comparison of methods with the cheap code (CC). The mean (and SE) of the L_2-loss and of the width and average coverage rate (CR) for the level 90%, 95% and 99% confidence intervals.

Code	Method	L_2-loss	90%		95%		99%	
			Width	CR	Width	CR	Width	CR
CC	Const	0.151	0.161	0.305	0.191	0.365	0.251	0.488
		(0.001)	(0.002)	(0.005)	(0.002)	(0.005)	(0.002)	(0.008)
	Param-Exp	0.827	0.568	0.887	0.676	0.939	0.889	0.987
		(0.642)	(0.310)	(0.014)	(0.369)	(0.010)	(0.486)	(0.005)
	Param-Quad	0.054	0.180	0.895	0.215	0.947	0.282	0.984
		(0.002)	(0.002)	(0.015)	(0.003)	(0.011)	(0.003)	(0.006)
	RKHS-Cubic	0.047	0.162	0.902	0.192	0.956	0.253	0.990
		(0.002)	(0.002)	(0.016)	(0.002)	(0.010)	(0.003)	(0.004)
	Baysian	0.068	0.851	1.000	1.013	1.000	1.327	1.000
		(0.002)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
	laGP	0.057	0.666	1.000	0.793	1.000	1.042	1.000
		(0.003)	(0.008)	(0.000)	(0.009)	(0.000)	(0.012)	(0.000)

Table 4: Simulation 4. Comparison of methods with the cheap code (CC). The mean (and SE) of the L_2-loss and of the width and average coverage rate (CR) for the level 90%, 95% and 99% confidence intervals.

Code	Method	L_2-loss	90%		95%		99%	
			Width	CR	Width	CR	Width	CR
CC	Const	0.039	0.129	0.891	0.154	0.938	0.202	0.972
		(0.002)	(0.001)	(0.022)	(0.002)	(0.017)	(0.002)	(0.011)
	Param-Exp	0.061	0.174	0.862	0.207	0.911	0.272	0.970
		(0.003)	(0.003)	(0.017)	(0.003)	(0.014)	(0.004)	(0.008)
	Param-Quad	0.068	0.224	0.888	0.267	0.938	0.350	0.984
		(0.003)	(0.006)	(0.013)	(0.007)	(0.010)	(0.009)	(0.004)
	RKHS-Cubic	0.051	0.177	0.896	0.211	0.952	0.277	0.989
		(0.002)	(0.002)	(0.015)	(0.003)	(0.010)	(0.004)	(0.004)
	Baysian	0.071	0.848	0.997	1.014	0.999	1.338	1.000
		(0.003)	(0.017)	(0.002)	(0.021)	(0.001)	(0.028)	(0.000)
	laGP	0.038	0.643	1.000	0.766	1.000	1.006	1.000
		(0.002)	(0.007)	(0.000)	(0.008)	(0.000)	(0.011)	(0.000)