automobile 26.96(4) 24.02(1) 36.73(7) 25.76(2) 26.00(3) 27.26(5) 30.57(6) fertility 100.08(1) 100.23(2) 109.34(6) 110.46(7) 108.76(5) 166.72(4) 104.61(3) 100.023(6) 98.08(1) 107.90(7) 89.06(3) 88.33(2) 97.01(4) 102.39(6) forest 102.02(6) 98.68(1) 102.05(7) 99.82(3) 99.96(4) 99.42(2) 101.45(5) servo 46.06(4) 44.33(1) 46.39(5) 46.48(7) 46.42(6) 44.86(2) 45.83(3) 46.38(1) 46.39(5) 46.48(7) 46.42(6) 44.86(2) 45.83(3) 46.97(7) 42.82(2) 105.71(6) 104.05(4) 100.73(3) traffic 37.30(4) 36.22(3) 46.04(7) 35.29(1) 35.47(2) 37.60(5) 44.99(6) wine.end 85.30(7) 79.89(3) 77.78(1) 84.52(6) 84.51(5) 80.84(4) 79.36(2) wine.end 84.91(7) 77.94(1) 77.96(2) 84.67(5) 84.51(5) 80.84(4) 79.36(2) wine.mine 20.05(4) 3.16E+07(6) 8.84E+07(7) 19.57(3) 19.55(2) 18.57(1) 22.09(5) 42.20(4)	kNNR	Best	LR	LRX	SWR	SWRX	SWRSC	SWRSCX
Flow	automobile		24.02(1)	36.73(7)	25.76(2)	26.00(3)	27.26(5)	30.57(6)
Forest 102.02(6) 98.68(1) 102.05(7) 99.82(3) 99.96(4) 99.42(2) 101.45(5)	fertility	100.08(1)	100.23(2)	109.34(6)	110.46(7)	108.76(5)	106.72(4)	104.61(3)
Servo 46.06(4) 44.33(1) 46.39(5) 46.48(7) 46.42(6) 44.86(2) 45.83(3) slump 92.55(1) 105.58(5) 110.62(7) 94.28(2) 105.71(6) 104.05(4) 100.73(3) traffic 37.30(4) 36.22(3) 46.04(7) 35.29(1) 35.47(2) 37.60(5) 44.99(6) wine_white 85.30(7) 79.89(3) 77.78(1) 84.52(6) 84.51(5) 80.84(4) 79.36(2) wine_white 84.91(7) 77.94(1) 77.96(2) 84.67(5) 84.74(6) 80.04(3) 80.53(4) Avg. Rank (3.89) (2.44) (5.44) (4.00) (4.33) (3.67) (4.22) Ridge Best LR LRX SWR SWRX SWRSC SWRSCX automobile 20.05(4) 3.16E+07(6) 8.84E+07(7) 19.57(3) 19.55(2) 18.57(1) 22.09(5) fertility 102.36(3) 2.05E+03(7) 1.19E+03(6) 102.96(4) 118.86(5) 97.07(1) 102.18(2) flow 66.07(5) 1.30E+07(6) 1.52E+08(7) 65.25(4) 63.56(2) 64.71(3) 61.61(1) forest 99.01(3) 683.72(6) 1.02E+03(7) 97.88(1) 99.58(5) 98.25(2) 99.27(4) servo 62.34(1) 201.26(6) 206.49(7) 62.68(2) 62.83(3) 63.52(4) 64.34(5) slump 86.55(5) 2.97E+08(6) 4.80E+08(7) 85.70(4) 85.41(2) 85.61(3) 76.88(1) traffic 39.51(2) 3.08E+07(6) 3.51E+09(7) 39.53(3) 39.94(4) 36.86(1) 47.18(5) wine_white 72.66(5) 6.95E+03(7) 763.03(6) 72.42(3) 72.42(2) 72.40(1) 72.47(4) Avg. Rank (3.22) (6.22) (6.78) (2.89) (3.22) (2.11) (3.56) Lasso Best LR LRX SWR SWRX SWRSC SWRSCX SWRSCX	flow	84.49(1)	98.01(5)	107.90(7)	89.06(3)	88.33(2)	97.01(4)	102.39(6)
Slump	forest	102.02(6)	98.68(1)	102.05(7)	99.82(3)	99.96(4)	99.42(2)	101.45(5)
traffic wine_red	servo	46.06(4)	44.33(1)	46.39(5)	46.48(7)	46.42(6)	44.86(2)	45.83(3)
wine_red 85.30(7) 79.89(3) 77.78(1) 84.52(6) 84.51(5) 80.84(4) 79.36(2) wine,white 84.91(7) 77.94(1) 77.96(2) 84.67(5) 84.74(6) 80.04(3) 80.53(4) Avg. Rank (3.89) (2.44) (5.44) (4.00) (4.33) (3.67) (4.22) Ridge Best LR LRX SWR SWRX SWRSC SWRSCX automobile 20.05(4) 3.16E+07(6) 8.84E+07(7) 19.57(3) 19.55(2) 18.57(1) 22.09(5) fertility 102.36(3) 2.05E+03(7) 1.19E+03(6) 102.96(4) 418.86(5) 97.07(1) 102.18(2) flow 66.07(5) 1.30E+07(6) 1.52E+08(7) 65.25(4) 63.56(5) 98.25(2) 99.27(4) servo 62.34(1) 201.26(6) 206.49(7) 65.26(2) 62.83(3) 63.52(4) 64.34(5) slump 86.55(5) 2.9TE+08(6) 4.80E+08(7) 85.70(4) 85.41(2) 86.61(3) 76.88(1) traffic	slump	92.55(1)	105.58(5)	110.62(7)	94.28(2)	105.71(6)	104.05(4)	100.73(3)
wine_white 84.91(7) 77.94(1) 77.96(2) 84.67(5) 84.74(6) 80.04(3) 80.53(4) Avg. Rank (3.89) (2.44) (5.44) (4.00) (4.33) (3.67) (4.22) Ridge Best LR LRX SWR SWRX SWRSC SWRSCX automobile 20.05(4) 3.16E+07(6) 8.84E+07(7) 19.57(3) 19.55(2) 18.57(1) 22.09(5) fertility 102.36(3) 2.05E+03(7) 1.19E+03(6) 102.96(4) 118.86(5) 97.07(1) 102.18(2) flow 66.07(5) 1.30E+07(6) 1.02E+03(7) 97.88(1) 99.58(5) 98.25(2) 99.27(4) servo 62.34(1) 201.26(6) 206.49(7) 62.68(2) 62.83(3) 63.52(2) 92.71(4) sump 86.55(5) 2.97E+08(6) 4.80E+08(7) 85.70(4) 85.41(2) 85.61(3) 76.88(1) traffic 39.51(2) 30.8E+07(6) 35.1E+09(7) 39.53(3) 39.94(4) 36.86(1) 47.18(5) wine_red	traffic	37.30(4)	36.22(3)	46.04(7)	35.29 (1)	35.47(2)	37.60(5)	44.99(6)
Ray	wine_red	85.30(7)	79.89(3)	77.78(1)	84.52(6)	84.51(5)	80.84(4)	79.36(2)
Ridge	wine_white	84.91(7)	77.94(1)	77.96(2)	84.67(5)	84.74(6)	80.04(3)	80.53(4)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Avg. Rank	(3.89)	(2.44)	(5.44)	(4.00)	(4.33)	(3.67)	(4.22)
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	Ridge	Best	LR	LRX	SWR	SWRX	SWRSC	SWRSCX
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	automobile	20.05(4)	3.16E+07(6)	8.84E + 07(7)	19.57(3)	19.55(2)	18.57(1)	22.09(5)
forest 99.01(3) 683.72(6) 1.02E+03(7) 97.88(1) 99.58(5) 98.25(2) 99.27(4) servo 62.34(1) 201.26(6) 206.49(7) 62.68(2) 62.83(3) 63.52(4) 64.34(5) slump 86.55(5) 2.97E+08(6) 4.80E+08(7) 85.70(4) 85.41(2) 85.61(3) 76.88(1) traffic 39.51(2) 3.08E+07(6) 3.51E+09(7) 39.53(3) 39.94(4) 36.86(1) 47.18(5) wine.red 64.89(1) 1.79E+07(6) 2.05E+07(7) 64.91(2) 65.04(4) 64.96(3) 65.67(5) wine.white 72.66(5) 6.95E+03(7) 763.03(6) 72.42(2) 72.40(1) 72.47(4) Avg. Rank (3.22) (6.22) (6.78) (2.89) (3.22) (2.11) (3.56) Lasso Best LR LRX SWR SWRX SWRSC SWRSCX automobile 18.45(4) 31.43(6) 58.25(7) 18.31(3) 18.31(2) 18.19(1) 20.63(5) fertility 95.55(1)	fertility	102.36(3)	2.05E+03(7)	1.19E + 03(6)	102.96(4)	118.86(5)	97.07(1)	102.18(2)
servo 62.34(1) 201.26(6) 206.49(7) 62.68(2) 62.83(3) 63.52(4) 64.34(5) slump 86.55(5) 2.9TE+08(6) 4.80E+08(7) 85.70(4) 85.41(2) 85.61(3) 76.88(1) traffic 39.51(2) 3.08E+07(6) 3.51E+09(7) 39.53(3) 39.94(4) 36.86(1) 47.18(5) wine_white 64.89(1) 1.79E+07(6) 2.05E+07(7) 64.91(2) 65.04(4) 64.96(3) 65.67(5) wine_white 72.66(5) 6.95E+03(7) 763.03(6) 72.42(3) 72.42(2) 72.40(1) 72.47(4) Avg. Rank (3.22) (6.22) (6.78) (2.89) (3.22) 72.40(1) 72.47(4) Lasso Best LR LRX SWR SWRX SWRSC SWRSCX automobile 18.45(4) 31.43(6) 58.25(7) 18.31(3) 18.31(2) 18.19(1) 20.63(5) fertility 95.55(1) 206.10(6) 270.66(7) 96.09(2) 96.29(3) 96.66(4) 102.64(5) flow	flow	66.07(5)	1.30E + 07(6)	1.52E + 08(7)	65.25(4)	63.56(2)	64.71(3)	61.61(1)
slump 86.55(5) 2.97E+08(6) 4.80E+08(7) 85.70(4) 85.41(2) 85.61(3) 76.88(1) traffic 39.51(2) 3.08E+07(6) 3.51E+09(7) 39.53(3) 39.94(4) 36.86(1) 47.18(5) wine_red 64.89(1) 1.79E+07(6) 2.05E+07(7) 64.91(2) 65.04(4) 64.96(3) 65.67(5) wine_white 72.66(5) 6.95E+03(7) 763.03(6) 72.42(2) 72.42(1) 72.47(4) Avg. Rank (3.22) (6.22) (6.78) (2.89) (3.22) (2.11) (3.56) Lasso Best LR LRX SWR SWRX SWRSC SWRSCX automobile 18.45(4) 31.43(6) 58.25(7) 18.31(3) 18.31(2) 18.19(1) 20.63(5) fertility 95.55(1) 206.10(6) 270.66(7) 96.09(2) 96.29(3) 96.66(4) 102.64(5) flow 66.82(5) 199.26(6) 200.90(7) 66.50(4) 64.56(2) 65.61(3) 61.68(1) selmp 8.75(5)	forest	99.01(3)	683.72(6)	1.02E + 03(7)	97.88(1)	99.58(5)	98.25(2)	99.27(4)
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	servo	62.34 (1)	201.26(6)	206.49(7)	62.68(2)	62.83(3)	63.52(4)	64.34(5)
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	slump	86.55(5)	2.97E+08(6)	4.80E + 08(7)	85.70(4)	85.41(2)	85.61(3)	76.88(1)
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	traffic	39.51(2)	3.08E+07(6)	3.51E+09(7)	39.53(3)	39.94(4)	36.86(1)	47.18(5)
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	wine_red	64.89(1)	1.79E+07(6)	2.05E+07(7)	64.91(2)	65.04(4)	64.96(3)	65.67(5)
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	wine_white	72.66(5)	6.95E + 03(7)	763.03(6)	72.42(3)	72.42(2)	72.40(1)	72.47(4)
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Avg. Rank	(3.22)	(6.22)	(6.78)	(2.89)	(3.22)	(2.11)	(3.56)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Lasso	Best	LR	LRX	SWR	SWRX	SWRSC	SWRSCX
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	automobile	18.45(4)	31.43(6)	58.25(7)	18.31(3)	18.31(2)	18.19(1)	20.63(5)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	fertility	95.55 (1)	206.10(6)	270.66(7)	96.09(2)	96.29(3)	96.66(4)	102.64(5)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	flow	66.82(5)	199.26(6)	200.90(7)	66.50(4)	64.56(2)	65.61(3)	61.68(1)
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	forest	100.14(5)	105.79(6)	106.76(7)	98.79(2)	99.57(3)	98.34(1)	99.61(4)
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	servo	63.17(3)	51.57(2)	51.35 (1)	63.23(4)	63.88(6)	63.77(5)	64.69(7)
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	slump	87.59(5)	96.34(7)	88.76(6)	86.74(4)	86.12(3)	86.06(2)	77.06(1)
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	traffic	38.64(2)	1.09E+07(6)	1.12E+09(7)	39.13(4)	39.03(3)	37.39 (1)	52.42(5)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	wine_red	69.24(4)	105.45(6)	107.94(7)	69.23(3)	69.34(5)	68.94(2)	68.34 (1)
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	wine_white	78.40(5)	78.21(2)	78.73(6)	78.33(4)	78.20 (1)	78.31(3)	78.87(7)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Avg. Rank	(3.78)	(5.22)	(6.11)	(3.33)	(3.11)	(2.44)	(4.00)
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	SVR	Best	LR	LRX	SWR	SWRX	SWRSC	SWRSCX
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	automobile	20.60(1)	273375.72(7)	95129.58(6)	21.48(2)	21.59(3)	21.89(4)	27.68(5)
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	fertility	98.43(4)	181.23(6)	227.20(7)	96.19 (1)	96.83(2)	97.97(3)	100.75(5)
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	flow	70.32(3)	3.69E+06(6)	9.66E + 06(7)	65.44(2)	63.31 (1)	72.94(4)	76.29(5)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	forest	98.14(1)	122.45(6)	128.73(7)	101.39(3)	101.70(4)	100.46(2)	102.05(5)
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	servo	21.53(5)	74.73(6)	119.47(7)	20.16(2)	20.42(3)	19.53(1)	20.53(4)
$ \begin{array}{llllllllllllllllllllllllllllllllllll$	slump	80.17(3)	8.55E+14(7)	2.25E+13(6)	79.01 (1)	79.30(2)	134.35(5)	
wine_white $78.04(5)$ $289.12(6)$ $337.95(7)$ $70.84(4)$ $70.80(3)$ $56.87(1)$ $56.91(2)$	traffic	41.89(1)	425.97(7)	323.31(6)		51.73(5)	43.97(2)	
	wine_red	66.87(5)	58.91(2)	59.78(4)	68.81(6)	69.00(7)	58.78 (1)	59.35(3)
	wine_white	78.04(5)	289.12(6)	337.95(7)	70.84(4)	70.80(3)	56.87 (1)	56.91(2)
11vg. Italia (5.11) (5.55) (2.56) (2.56) (4.66)	Avg. Rank	(3.11)	(5.89)	(6.33)	(2.78)	(3.33)	(2.56)	(4.00)

Table 5: The 3-fold cross validation relative mean squared error and Friedman ranks for all datasets when the best hyperparameter configuration trial (Best), linear regression via least squared with the option of adding features (LRX) or not (LR), non-hyperparametric stepwise regression adding features (SWRX) or not (SWR) and non-hyperparametric stepwise regression adaptation with stop criterion adding features (SWRSCX) or not (SWRSC), all taking into account several baseline systems (kNNR, Ridge, Lasso and SVR) and the HB sampling strategy.