Table 1: $P-values$ of Wilcoxon paired test for multiple comparisons with Bonferroni correction for Test error with RMSE and with Complexity Metrics on Boston dataset.

	RMSE	ϕC	d	θ	nao	$naoc$	no	ϕ	S	$S\theta$
ϕC	1.0000									
d	**0.0264**	1.0000								
θ	0.2258	1.0000	1.0000							
nao	1.0000	1.0000	1.0000	1.0000						
$naoc$	1.0000	0.3056	**0.0207**	0.1506	1.0000					
no	0.2258	1.0000	1.0000	1.0000	1.0000	**0.0478**				
ϕ	1.0000	1.0000	1.0000	1.0000	1.0000	0.3328	1.0000			
S	0.0672	1.0000	1.0000	1.0000	1.0000	0.0161	1.0000	1.0000		
$S\theta$	0.1669	1.0000	1.0000	1.0000	1.0000	**0.0402**	1.0000	1.0000	1.0000	
λ	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.9221	1.0000	0.0777	0.3363

Table 2: $P-values$ of Wilcoxon paired test for multiple comparisons with Bonferroni correction for Test error with RMSE and with Complexity Metrics on ENB Cooling dataset.

	RMSE	ϕC	d	θ	nao	$naoc$	no	ϕ	S	$S\theta$
ϕC	**0.0000**									
d	**0.0000**	1.0000								
θ	**0.0000**	1.0000	1.0000							
nao	1.0000	**0.0000**	**0.0000**	**0.0000**						
$naoc$	1.0000	**0.0000**	**0.0000**	**0.0000**	0.7256					
no	**0.0000**	1.0000	1.0000	1.0000	**0.0000**	**0.0000**				
ϕ	**0.0000**	**0.0398**	**0.0336**	**0.0009**	**0.0000**	**0.0000**	**0.0142**			
S	**0.0000**	1.0000	1.0000	0.7507	**0.0000**	**0.0000**	1.0000	1.0000		
$S\theta$	**0.0000**	1.0000	1.0000	0.0839	**0.0000**	**0.0000**	0.4826	1.0000	1.0000	
λ	**0.0000**	1.0000	1.0000	0.1748	**0.0000**	**0.0000**	0.6160	1.0000	1.0000	1.0000

Table 3: $P-values$ of Wilcoxon paired test for multiple comparisons with Bonferroni correction for Test error with RMSE and with Complexity Metrics on ENB Heating dataset.

	RMSE	ϕC	d	θ	nao	$naoc$	no	ϕ	S	$S\theta$
ϕC	**0.0000**									
d	**0.0000**	1.0000								
θ	**0.0000**	1.0000	1.0000							
nao	1.0000	**0.0000**	**0.0000**	**0.0000**						
$naoc$	1.0000	**0.0000**	**0.0000**	**0.0000**	0.8898					
no	**0.0000**	1.0000	1.0000	1.0000	**0.0000**	**0.0000**				
ϕ	**0.0000**	**0.0079**	**0.0046**	**0.0003**	**0.0000**	**0.0000**	**0.0079**			
S	**0.0000**	1.0000	1.0000	0.3667	**0.0000**	**0.0000**	1.0000	1.0000		
$S\theta$	**0.0000**	1.0000	1.0000	1.0000	**0.0000**	**0.0000**	1.0000	0.3833	1.0000	
λ	**0.0000**	1.0000	1.0000	1.0000	**0.0000**	**0.0000**	1.0000	1.0000	1.0000	1.0000

Table 4: $P-values$ of Wilcoxon paired test for multiple comparisons with Bonferroni correction for Test error with RMSE and with Complexity Metrics on Airfoil dataset.

	RMSE	ϕC	d	θ	nao	$naoc$	no	ϕ	S	$S\theta$
ϕC	1.0000									
d	1.0000	1.0000								
θ	1.0000	1.0000	1.0000							
nao	1.0000	1.0000	1.0000	1.0000						
$naoc$	1.0000	1.0000	1.0000	1.0000	1.0000					
no	**0.0001**	**0.0019**	**0.0005**	**0.0000**	**0.0003**	**0.0001**				
ϕ	0.1042	1.0000	1.0000	0.0987	0.1357	**0.0317**	1.0000			
S	**0.0103**	**0.0492**	0.0987	**0.0125**	**0.0478**	**0.0125**	1.0000	1.0000		
$S\theta$	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	**0.0001**	1.0000	**0.0103**	
λ	**0.0006**	**0.0492**	**0.0103**	**0.0022**	**0.0004**	**0.0002**	1.0000	1.0000	1.0000	**0.0069**

Table 5: $P - values$ of Wilcoxon paired test for multiple comparisons with Bonferroni correction for Test error with RMSE and with Complexity Metrics on RB Cost dataset.

	RMSE	ϕC	d	θ	nao	$naoc$	no	ϕ	S	$S\theta$
ϕC	0.0635									
d	1.0000	**0.0353**								
θ	1.0000	1.0000	1.0000							
nao	1.0000	**0.0006**	1.0000	0.0549						
$naoc$	1.0000	0.1848	1.0000	1.0000	1.0000					
no	1.0000	0.1074	1.0000	1.0000	1.0000	1.0000				
ϕ	1.0000	0.0878	1.0000	1.0000	1.0000	1.0000	1.0000			
S	1.0000	0.0753	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000		
$S\theta$	1.0000	1.0000	0.3432	1.0000	**0.0196**	1.0000	1.0000	1.0000	0.6563	
λ	1.0000	1.0000	1.0000	1.0000	0.0927	1.0000	1.0000	1.0000	1.0000	1.0000

Table 6: $P - values$ of Wilcoxon paired test for multiple comparisons with Bonferroni correction for Test error with RMSE and with Complexity Metrics on RB Sales dataset.

	RMSE	ϕC	d	θ	nao	$naoc$	no	ϕ	S	$S\theta$
ϕC	0.6886									
d	1.0000	**0.0057**								
θ	1.0000	1.0000	**0.0110**							
nao	0.8177	**0.0001**	1.0000	**0.0002**						
$naoc$	1.0000	**0.0021**	1.0000	**0.0133**	1.0000					
no	1.0000	**0.0123**	1.0000	0.0547	1.0000	1.0000				
ϕ	1.0000	1.0000	1.0000	1.0000	0.2549	1.0000	1.0000			
S	1.0000	**0.0472**	1.0000	0.0976	1.0000	1.0000	1.0000	1.0000		
$S\theta$	1.0000	0.7002	0.0769	1.0000	**0.0207**	0.4377	1.0000	1.0000	1.0000	
λ	1.0000	**0.0057**	1.0000	**0.0184**	1.0000	1.0000	1.0000	1.0000	1.0000	0.5077

Table 7: $P - values$ of Wilcoxon test for the differences between Test and Train RMSE for each dataset. Bonferroni corrected $p - value = 0.00076$.

	Boston	ENB Cooling	ENB Heating	Airfoil	RB Cost	RB Sales
RMSE	**0.000000**	0.004530	**0.000426**	**0.000000**	**0.000000**	0.000002
ϕC	**0.000000**	**0.000000**	**0.000000**	0.001677	**0.000000**	**0.000007**
d	**0.000000**	**0.000000**	**0.000006**	**0.000083**	**0.000000**	**0.000000**
θ	**0.000000**	**0.000000**	**0.000000**	0.042996	**0.000000**	**0.000000**
nao	**0.000000**	**0.000247**	**0.000000**	0.000820	**0.000000**	**0.000000**
$naoc$	**0.000000**	**0.000576**	**0.000028**	**0.000001**	**0.000083**	0.000001
no	**0.000000**	**0.000143**	**0.000000**	0.662726	**0.000000**	**0.000000**
ϕ	**0.000000**	0.044579	0.041460	0.138126	**0.000000**	**0.000000**
S	**0.000000**	**0.000044**	**0.000125**	0.150416	**0.000000**	**0.000000**
$S\theta$	**0.000000**	0.009181	0.005242	**0.000000**	**0.000000**	**0.000000**
λ	**0.000000**	0.026032	0.003360	0.522879	**0.000000**	**0.000000**

Table 8: Best train error solutions analysed with regard to the interpretability of the model. The *s(n)* gives the size of the solutions that were not analysed. The $\emptyset$ indicate the solutions that did not contain any features, the † indicates the solutions with the test error larger than the train error and the $\star$ indicates the solutions that were considered the best for that dataset.

	Boston	e_{train}	e_{test}	ENB Cooling	e_{train}	e_{test}
RMSE	s(131)	2.91	8.99†	s(68)	1.41	2.13†
ϕC	s(44)	3.65	12.63†	$(f_4 + (-0.27))\,/0.23$	4.94	5.96†
d	$(0.76 - (f_5 - cos(0.49 + 0.28)))^2$	3.65	12.26†	$\left(\left((\sqrt{0.79})^2 \times \sqrt{f_1}\right) - (-0.83)\right) \times \left(sin(f_4) + \sqrt{(-0.46) + (-0.26)}\right)$	4.10	5.87†
θ	$[(0.94 + sin((0.75 + 0.69 - 0.86^2)^2)) - s(\sqrt{cos(-0.31)}) - (0.86 - f_5)]^2$	3.63	12.44†	s(48)	4.32	6.00†
nao	s(83)	2.79	12.45†	s(105)	1.48	1.52†
$naoc$	s(78)	2.77	15.67†	s(99)	1.41	2.67†
no	$\star\ \left((-0.76 - 0.44)^2 - f_5\right)^2$	3.63	12.41†	$\star\ \frac{f_4}{f_3} \times f_1$	4.43	5.00†
ϕ	$\left(\sqrt{\left((sin(0.94) \times \frac{f_5}{0.81} + sin(sin(-0.65))) - sin(cos(sin(-0.37)))\right)^2}\right)^2$	3.69	12.76†	s(51)	4.45	6.08†
S	$\left(\left(f_5 - \sqrt{cos((-0.67) - 0.07}\right) + .sin(-0.68)\right)^2$	3.66	12.22†	s(23)	4.60	6.12†
$S\theta$	$\star\ \left(\sqrt{0.23} - (f_5 + (-0.96))\right)^2$	3.63	12.46†	s(32), $\emptyset$	4.66	5.66†
λ	f_{10}	4.20	12.73†	$f_4/0.25$	4.60	6.20†
	ENB Heating			Airfoil		
RMSE	s(104)	1.35	1.56†	s(124)	3.73	5.78†
ϕC	$\star\ \frac{f_1}{f_3} \times (f_4 - (-0.16))$	4.44	5.25†	$\star\ \left(\left(\frac{-0.83}{0.01} - \frac{-0.59}{(f_1 - (-0.28))}\right) - f_2\right) - f_2$	6.63	6.26
d	s(94)	4.30	6.51†	s(69)	6.33	6.06
θ	s(22)	4.20	5.64†	s(88)	6.01	6.16†
nao	s(89)	2.09	4.06†	s(161)	4.01	7.40†
$naoc$	s(136)	1.48	1.64†	s(127)	3.77	5.91†
no	$(sin\,(f_4 \times (-0.86)))^2 \times f_1$	4.41	5.44†	$\left(\left(sin(-0.58) - \left(0.42 - \frac{0.23}{(-0.08)}\right)^2\right) + (f_4 \times 0.42)\right)^2$	6.74	6.57
ϕ	s(6), $\emptyset$	4.59	5.06†	s(27)	6.69	6.30
S	$\left(\frac{\sqrt{f_4} - 0.17}{0.46}\right)^2$	4.46	6.07†	s(6), $\emptyset$	6.75	6.39
$S\theta$	s(15), $\emptyset$	4.34	5.68†	s(13), $\emptyset$	6.74	6.38
λ	$\star\ (-0.63) + \left(\frac{f_4}{0.24}\right)$	4.54	6.30†	s(7), $\emptyset$	6.76	6.50
	RB Cost			RB Sales		
RMSE	s(58)	126.77	61.27	s(98)	155.27	180.06†
ϕC	$\star\ \frac{f_1/\left(\frac{f_{32}}{f_{103}}\right)}{f_{91}} + f_{11}$	251.33	86.69	$\star\ f_{11} + \left(\left(\frac{f_{11}}{f_{91}} - \frac{f_{54}}{f_{12}}\right) + f_4 + f_4 + f_{91} + f_{91} + f_4\right)$	243.44	136.28
d	$f_{11} + \sqrt{f_{11} \times f_{95}}$	334.99	182.08	$\sqrt{f_{11} \times \left(sin(\frac{f_{73}}{f_{106}} - \sqrt{f_{61}}) \times f_{19}\right)} + (f_{78} + f_{11})$	292.57	115.00
θ	s(106)	258.85	142.97	s(34)	291.75	122.02
nao	s(119)	115.30	76.36	s(106)	119.75	95.03
$naoc$	s(92)	124.16	127.17†	s(80)	126.20	105.32
no	$\left(\frac{f_{11}}{f_{92}}\right) \times f_{16}$	257.69	62.33	$\star f_{11}/\left(\frac{f_{75}}{f_{13}}\right)$	258.69	103.93
ϕ	$\left(\left(\frac{cos(f_{61})}{sin(((f_{12} + f_{46}) - f_{11}) - f_{16})}\right) \times f_{11}\right)/f_{92}$	257.69	62.33	$\frac{f_{11}}{\sqrt{cos(cos(sin(cos(f_{62}/f_{36}))))}}$	266.14	82.09
S	$f_{11} + \left(\frac{f_{11}}{f_{72}}\right)$	281.01	88.14	f_{11}	279.44	106.09
$S\theta$	$\left(\sqrt{f_{11} + \left((0.97 + 0.97)^2 + (0.97 + 0.97)\right)}\right)^2$	297.51	135.34	s(31)	285.23	128.63
λ	$(f_{38} + f_{11}) + \sqrt{f_{11} + f_{53}}$	358.16	140.78	f_{11}	279.44	106.09