

Results of the Configurable SAT Solver Challenge 2013

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In this document, we describe the results of the Configurable SAT Solver Challenge (CSSC) 2013.

1 Executive Results

Tables 1 to 3 provide the final results for the three tracks of CSSC 2013.

Solver	CSSC Results		Solver defaults	
	#(timeouts)	avg. time for solved	#(timeouts)	avg. time for solved
lingeling	115	12.78	136	16.35
riss3g	117	10.18	122	10.80
Solver43	127	13.17	127	14.46
forl-nodrup	128	15.07	152	19.01
simpsat	128	20.27	134	19.59
clasp-cssc	130	9.97	163	11.21
sat4j	176	19.46	184	21.37
gnoelty+GCwa	1090	23.88	1131	7.30
gnoelty+PCL	1099	9.62	1101	14.07
gnoelty+GCa	1104	10.97	1129	14.81
riss3gExt (hors concours)	82	8.25	123	10.53

Table 1: Final results for CSSC track Application

Solver	CSSC Results		Solver defaults	
	#(timeouts)	avg. time for solved	#(timeouts)	avg. time for solved
clasp-cssc	96	13.87	139	7.10
forl-nodrup	98	15.27	135	10.01
lingeling	107	10.75	148	7.51
riss3g	131	7.52	148	7.52
simpsat	149	9.86	149	9.86
Solver43	152	8.79	156	10.75
sat4j	161	7.44	172	9.42
gnoelty+GCwa	334	13.34	375	4.33
gnoelty+GCa	353	7.13	423	4.74
gnoelty+PCL	361	12.02	378	12.02
riss3gExt (hors concours)	44	4.71	148	7.09

Table 2: Final results for CSSC track Hard Combinatorial

Solver	CSSC Results		Solver defaults	
	#(timeouts)	avg. time for solved	#(timeouts)	avg. time for solved
clasp-cssc	250	1.58	261	14.10
lingeling	250	4.20	258	13.24
riss3g	250	7.68	260	11.51
Solver43	253	12.32	256	11.34
simpsat	254	13.85	254	13.95
sat4j	255	14.96	257	16.33
forl-nodrup	258	11.61	289	14.75
gnoelty+GCwa	375	13.40	382	22.64
gnoelty+GCa	378	19.58	537	48.11
gnoelty+PCL	385	44.46	624	0.11
riss3gExt (hors concours)	250	7.20	261	11.00

Table 3: Final results for CSSC track Random

2 Performance Tables for Each Benchmark

Tables 4 to 12 provide detailed performance tables for each benchmark in the CSSC 2013.

Solver	Training performance				Test performance			
	#(timeouts)		avg. time for solved (s)		#(timeouts)		avg. time for solved (s)	
	default	optimized	default	optimized	default	optimized	default	optimized
clasp-2.1-sat-t1.txt	86	84	10.09	7.54	71	71	9.39	6.26
lingeling-params-mixed.pcs	81	80	13.02	13.26	69	69	11.24	8.76
for1-nodrup-params.pcs	83	82	18.19	13.29	69	69	15.90	9.17
gnovelty+GCa-params.pcs	371	371	0.86	0.86	295	295	1.14	1.14
gnovelty+GCwa-params.pcs	371	371	1.09	1.02	295	295	1.43	1.21
gnovelty+PCL-params.pcs	373	371	10.31	2.39	295	294	30.05	34.19
riss3g-params.pcs	82	82	8.94	7.26	70	69	6.63	5.77
riss3gExt-params.pcs	82	67	9.09	15.80	70	46	6.36	14.98
sat4j-params.pcs	98	98	20.88	20.29	77	76	17.88	15.61
simpsat-params.pcs	84	82	14.33	16.53	70	69	12.85	13.54
Solver43-params.pcs	91	90	7.63	8.46	77	77	8.14	5.14

Table 4: Performance of all solvers for benchmark CSSC-IBM-300s-2day

Solver	Training performance				Test performance			
	#(timeouts)		avg. time for solved (s)		#(timeouts)		avg. time for solved (s)	
	default	optimized	default	optimized	default	optimized	default	optimized
clasp-2.1-sat-t1-discrete.txt	250	250	0.00	0.00	250	250	0.00	0.00
lingeling-params.pcs	250	250	0.00	0.00	250	250	0.00	0.00
for1-nodrup-params.pcs	250	250	0.00	0.00	250	250	0.00	0.00
gnovelty+GCa-params.pcs	158	6	128.68	32.05	163	4	117.74	29.58
gnovelty+GCwa-params.pcs	10	0	32.61	22.35	8	1	34.41	20.16
gnovelty+PCL-params.pcs	250	10	0.00	72.06	250	11	0.00	67.82
riss3g-params.pcs	250	250	0.00	0.00	250	250	0.00	0.00
riss3gExt-params.pcs	250	250	0.00	0.00	250	250	0.00	0.00
sat4j-params.pcs	250	250	0.00	0.00	250	250	0.00	0.00
simpsat-params.pcs	250	250	0.00	0.00	250	250	0.00	0.00
Solver43-params.pcs	250	250	0.00	0.00	250	250	0.00	0.00

Table 5: Performance of all solvers for benchmark CSSC-5SAT500-sat-300s-2day

Solver	Training performance				Test performance			
	#(timeouts)		avg. time for solved (s)		#(timeouts)		avg. time for solved (s)	
	default	optimized	default	optimized	default	optimized	default	optimized
clasp-2.1-sat-t1-discrete.txt	23	7	15.13	14.28	26	17	21.38	12.43
lingeling-params-discrete.pcs	36	12	20.41	17.80	39	20	25.12	16.54
for1-nodrup-params.pcs	29	15	17.69	19.86	33	23	20.49	20.45
gnovelty+GCa-params.pcs	297	295	62.81	149.18	300	302	144.06	0.00
gnovelty+GCwa-params.pcs	296	292	252.19	109.81	301	295	178.95	127.30
gnovelty+PCL-params.pcs	299	299	0.00	0.00	302	302	0.00	0.00
riss3g-params.pcs	19	11	15.06	16.47	20	18	19.83	16.21
riss3gExt-params.pcs	19	11	15.40	15.14	21	16	19.35	16.32
sat4j-params.pcs	29	24	20.10	24.44	36	30	26.36	23.88
simpsat-params.pcs	25	21	16.52	19.52	26	24	23.34	23.29
Solver43-params.pcs	19	11	14.16	17.04	20	20	18.18	19.48

Table 6: Performance of all solvers for benchmark CSSC-CircuitFuzz-300s-2day

Solver	Training performance				Test performance			
	#(timeouts)		avg. time for solved (s)		#(timeouts)		avg. time for solved (s)	
	default	optimized	default	optimized	default	optimized	default	optimized
clasp-2.1-sat-t1-discrete.txt	131	33	4.27	13.25	42	6	3.45	14.16
lingeling-params-discrete.pcs	131	32	3.08	10.87	43	10	2.74	9.33
forl-nodrup-params.pcs	115	36	9.35	16.34	40	7	6.97	17.15
gnovelty+GCa-params.pcs	592	578	2.78	2.69	183	180	2.57	2.14
gnovelty+GCwa-params.pcs	578	578	4.36	2.79	180	180	4.39	2.26
gnovelty+PCL-params.pcs	599	582	6.14	9.94	179	178	10.62	9.44
riss3g-params.pcs	143	128	5.80	5.85	51	42	3.76	3.65
riss3gExt-params.pcs	143	2	5.70	0.57	50	2	4.67	0.59
sat4j-params.pcs	182	159	6.77	7.19	62	57	4.48	4.47
simpsat-params.pcs	124	124	6.94	6.94	42	42	7.54	7.54
Solver43-params.pcs	202	194	9.69	4.87	66	65	6.71	3.16

Table 7: Performance of all solvers for benchmark CSSC-GI-300s-2day

Solver	Training performance				Test performance			
	#(timeouts)		avg. time for solved (s)		#(timeouts)		avg. time for solved (s)	
	default	optimized	default	optimized	default	optimized	default	optimized
clasp-2.1-sat-t1.txt	213	191	18.20	20.29	66	42	14.91	22.01
lingeling-params-discrete.pcs	139	137	29.91	31.25	28	26	26.62	26.14
forl-nodrup-params.pcs	187	173	45.69	35.73	50	36	38.65	31.03
gnovelty+GCa-params.pcs	774	763	6.76	17.97	291	290	16.35	5.56
gnovelty+GCwa-params.pcs	768	753	12.96	44.36	291	285	15.44	58.67
gnovelty+PCL-params.pcs	770	755	7.91	31.68	289	288	29.86	36.90
riss3g-params.pcs	156	144	21.31	26.88	32	30	16.33	18.51
riss3gExt-params.pcs	157	51	20.32	5.74	32	20	16.06	2.67
sat4j-params.pcs	257	256	41.34	44.31	70	70	38.53	39.48
simpsat-params.pcs	175	173	40.31	42.92	38	35	38.70	40.32
Solver43-params.pcs	142	142	30.23	30.23	30	30	25.22	25.22

Table 8: Performance of all solvers for benchmark CSSC-BMC08-300s-2day

Solver	Training performance				Test performance			
	#(timeouts)		avg. time for solved (s)		#(timeouts)		avg. time for solved (s)	
	default	optimized	default	optimized	default	optimized	default	optimized
clasp-2.1-sat-t1.txt	90	88	10.54	10.83	97	90	11.53	13.50
lingeling-params-discrete.pcs	95	92	14.29	11.89	105	97	13.49	12.66
forl-nodrup-params.pcs	92	88	12.30	12.11	95	91	13.71	12.79
gnovelty+GCa-params.pcs	242	178	23.44	11.80	240	173	8.02	11.92
gnovelty+GCwa-params.pcs	190	149	12.25	29.67	195	154	4.27	22.96
gnovelty+PCL-params.pcs	197	188	14.39	11.60	199	183	13.61	14.67
riss3g-params.pcs	91	87	8.84	13.30	97	89	11.97	12.08
riss3gExt-params.pcs	89	42	10.78	15.02	98	42	9.96	9.37
sat4j-params.pcs	103	95	19.24	14.70	110	104	15.34	10.98
simpsat-params.pcs	101	101	9.65	9.65	107	107	12.80	12.80
Solver43-params.pcs	85	84	12.81	15.59	90	87	15.15	14.89

Table 9: Performance of all solvers for benchmark CSSC-LABS-300s-2day

Solver	Training performance				Test performance			
	#(timeouts)		avg. time for solved (s)		#(timeouts)		avg. time for solved (s)	
	default	optimized	default	optimized	default	optimized	default	optimized
clasp-2.1-sat-t1.txt	25	0	31.35	4.23	11	0	27.33	2.79
lingeling-params-mixed.pcs	20	0	28.30	9.51	8	0	25.26	7.86
forl-nodrup-params.pcs	57	15	32.26	30.05	39	8	27.20	22.31
gnovelty+GCa-params.pcs	162	162	0.02	0.02	124	124	0.04	0.04
gnovelty+GCwa-params.pcs	162	162	0.04	0.02	124	124	0.04	0.04
gnovelty+PCL-params.pcs	162	162	0.09	0.05	124	124	0.11	0.15
riss3g-params.pcs	15	0	26.64	17.65	10	0	22.51	14.76
riss3gExt-params.pcs	15	0	27.34	19.74	11	0	21.52	13.86
sat4j-params.pcs	19	11	33.45	34.52	7	5	28.20	25.72
simpsat-params.pcs	12	10	28.68	30.53	4	4	25.48	25.30
Solver43-params.pcs	15	8	24.88	29.82	6	3	22.11	24.06

Table 10: Performance of all solvers for benchmark CSSC-K3-300s-2day

Solver	Training performance				Test performance			
	#(timeouts)		avg. time for solved (s)		#(timeouts)		avg. time for solved (s)	
	default	optimized	default	optimized	default	optimized	default	optimized
clasp-2.1-sat-t1-discrete.txt	0	0	1.45	0.37	0	0	1.44	0.37
lingeling-params-mixed.pcs	0	0	1.60	0.54	0	0	1.61	0.54
forl-nodrup-params.pcs	0	0	4.32	1.25	0	0	4.24	1.24
gnoelty+GCa-params.pcs	300	300	0.00	0.00	250	250	0.00	0.00
gnoelty+GCwa-params.pcs	300	300	0.00	0.00	250	250	0.00	0.00
gnoelty+PCL-params.pcs	300	300	0.00	0.00	250	250	0.00	0.00
riss3g-params.pcs	0	0	0.95	0.60	0	0	0.94	0.60
riss3gExt-params.pcs	0	0	0.96	0.53	0	0	0.95	0.53
sat4j-params.pcs	0	0	4.87	4.31	0	0	4.80	4.40
simpsat-params.pcs	0	0	2.62	2.61	0	0	2.59	2.59
Solver43-params.pcs	0	0	0.84	0.73	0	0	0.82	0.72

Table 11: Performance of all solvers for benchmark CSSC-unsat-unif-k5-300s-2day

Solver	Training performance				Test performance			
	#(timeouts)		avg. time for solved (s)		#(timeouts)		avg. time for solved (s)	
	default	optimized	default	optimized	default	optimized	default	optimized
clasp-2.1-sat-t1.txt	0	0	0.52	0.12	0	0	0.44	0.11
lingeling-params-discrete.pcs	1	0	5.16	0.16	0	0	3.32	0.16
forl-nodrup-params.pcs	0	0	4.56	0.66	0	0	3.71	0.59
gnoelty+GCa-params.pcs	251	235	7.98	20.32	243	217	11.76	12.54
gnoelty+GCwa-params.pcs	250	235	3.56	5.76	244	215	3.51	10.59
gnoelty+PCL-params.pcs	235	234	4.30	5.14	215	215	10.42	2.97
riss3g-params.pcs	0	0	0.71	0.42	0	0	0.61	0.40
riss3gExt-params.pcs	0	0	0.65	0.12	0	0	0.57	0.11
sat4j-params.pcs	1	0	5.30	3.11	1	0	6.35	2.99
simpsat-params.pcs	0	0	6.32	5.27	0	0	4.64	4.97
Solver43-params.pcs	0	0	6.27	2.60	0	0	6.00	2.39

Table 12: Performance of all solvers for benchmark CSSC-SWV-300s-2days

3 Scatter Plots Default vs. Configured Performance for Each Benchmark

Figures 1 to 9 provide scatter plots of the performance of each solver with its default parameter settings vs. its configured parameter settings, for each benchmark in the CSSC 2013.

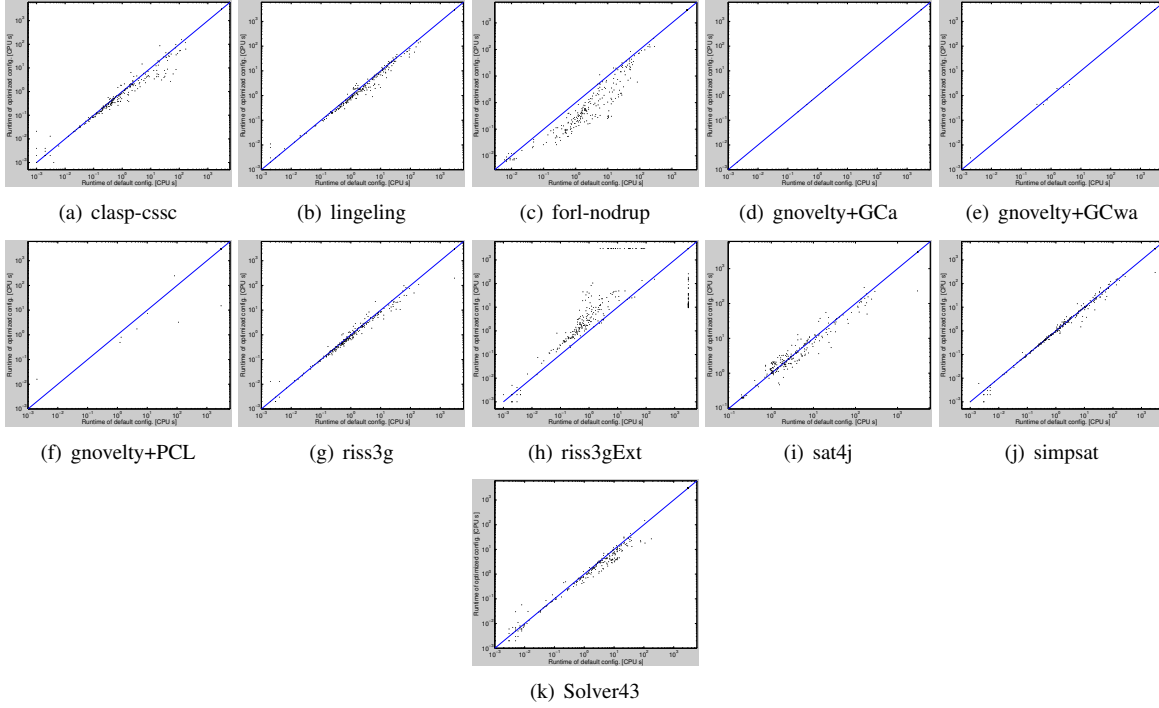


Figure 1: Default vs. optimized configurations of all solvers for benchmark CSSC-IBM-300s-2day.

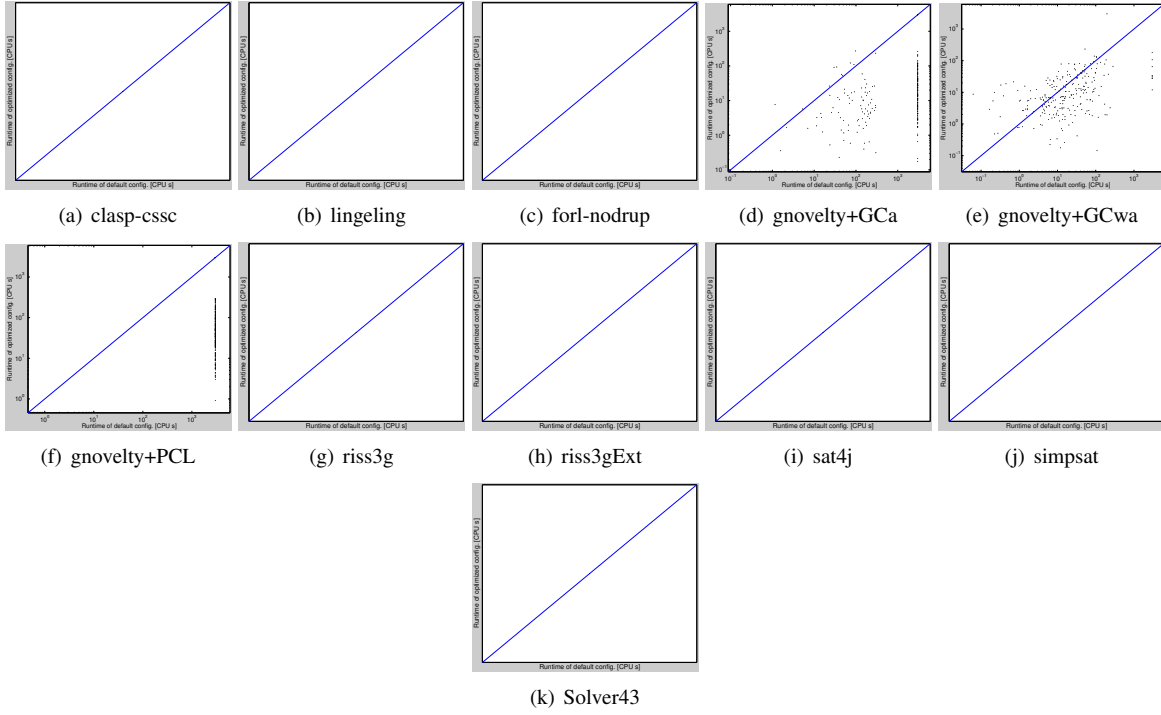


Figure 2: Default vs. optimized configurations of all solvers for benchmark CSSC-5SAT500-sat-300s-2day.

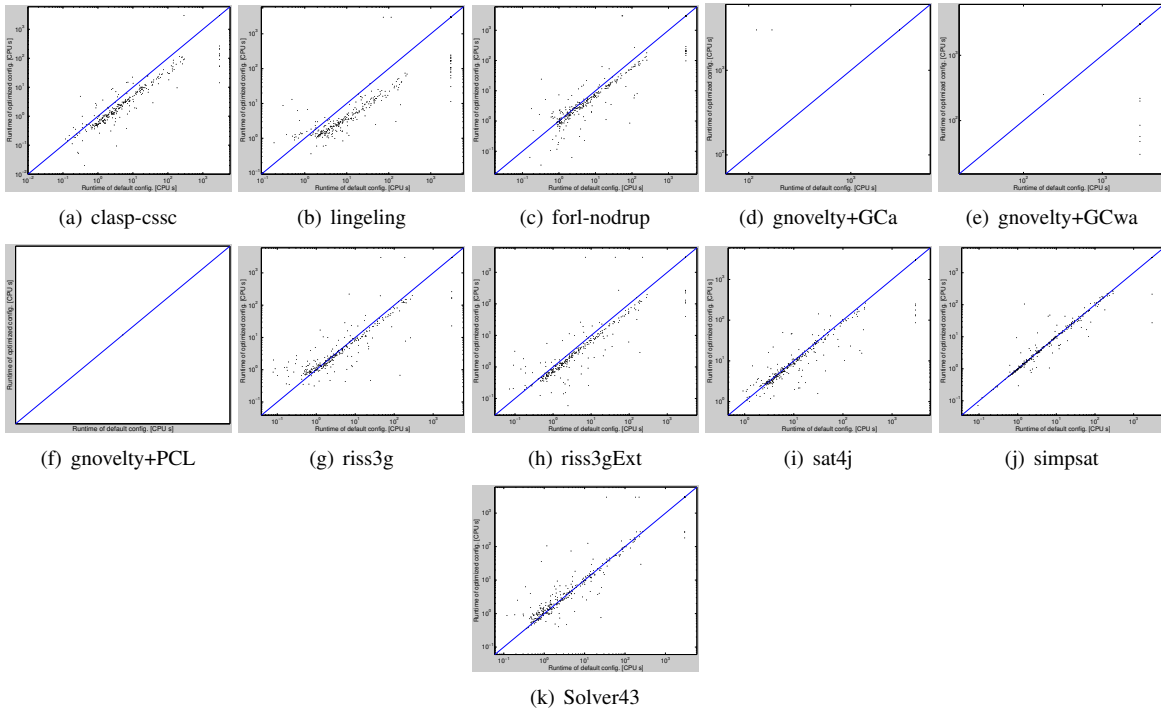


Figure 3: Default vs. optimized configurations of all solvers for benchmark CSSC-CircuitFuzz-300s-2day.

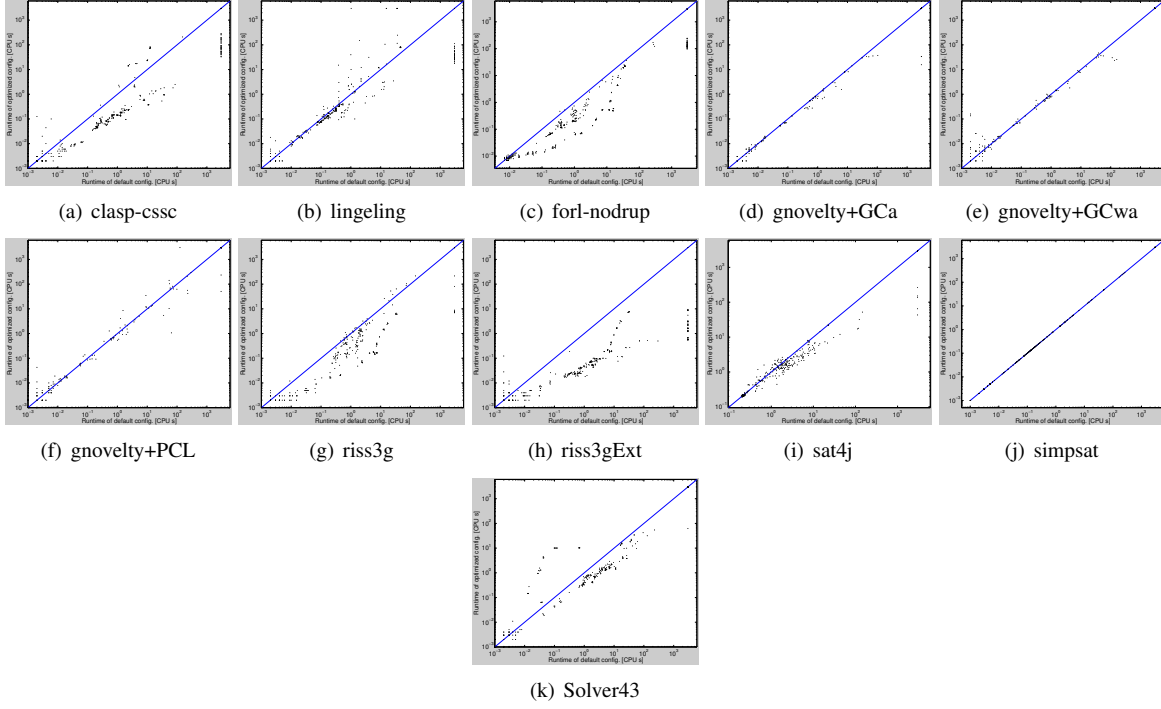


Figure 4: Default vs. optimized configurations of all solvers for benchmark CSSC-GI-300s-2day.

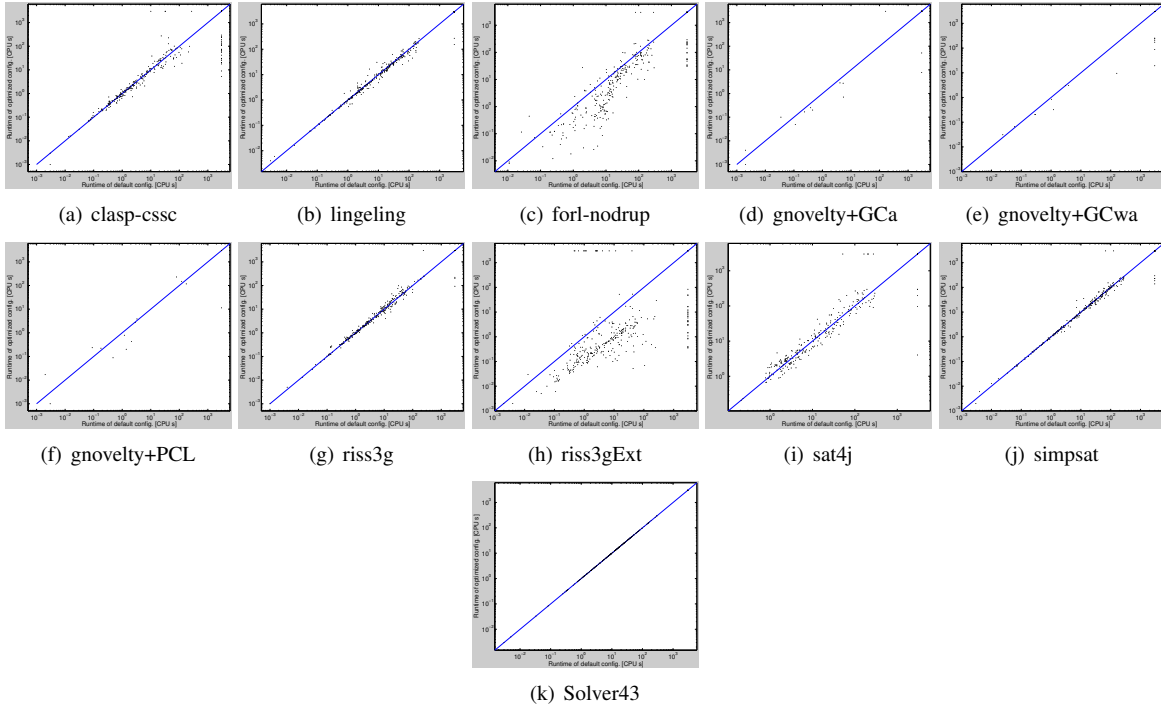


Figure 5: Default vs. optimized configurations of all solvers for benchmark CSSC-BMC08-300s-2day.

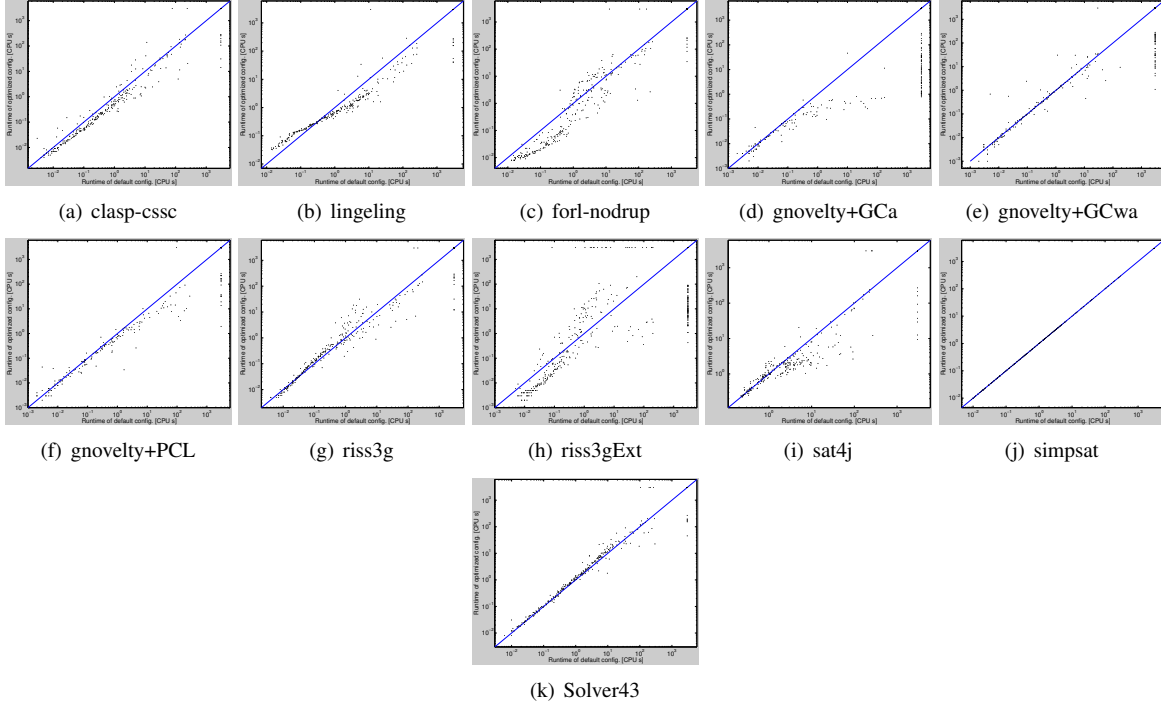


Figure 6: Default vs. optimized configurations of all solvers for benchmark CSSC-LABS-300s-2day.

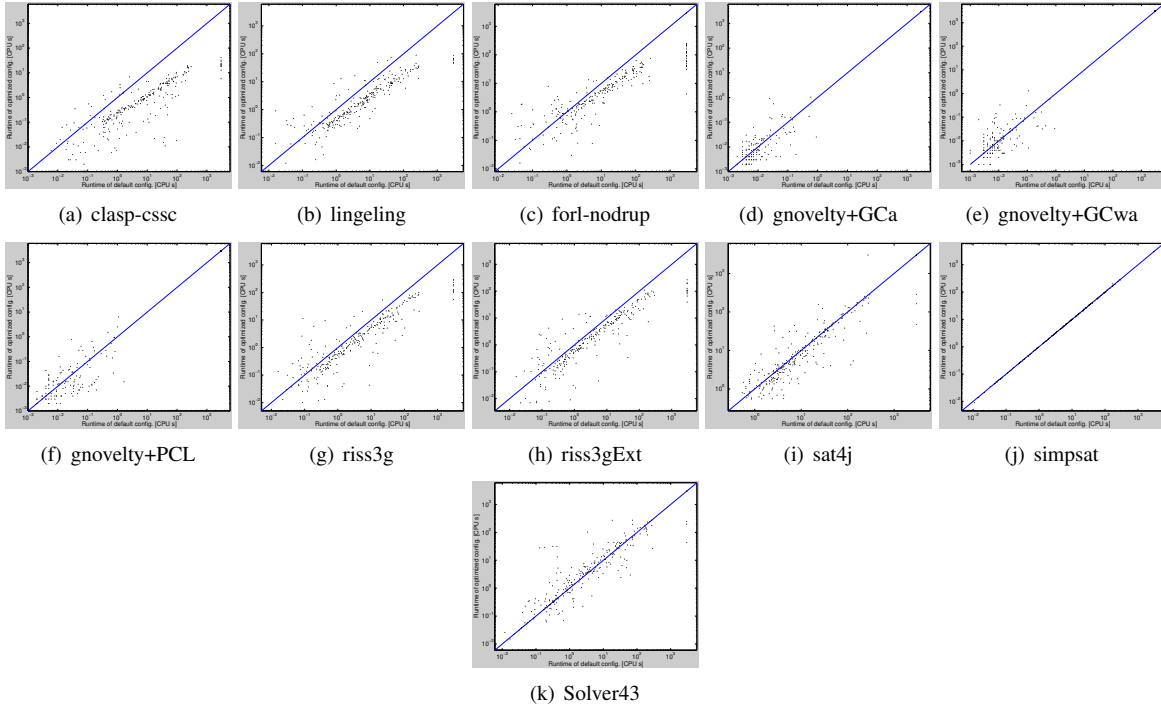


Figure 7: Default vs. optimized configurations of all solvers for benchmark CSSC-K3-300s-2day.

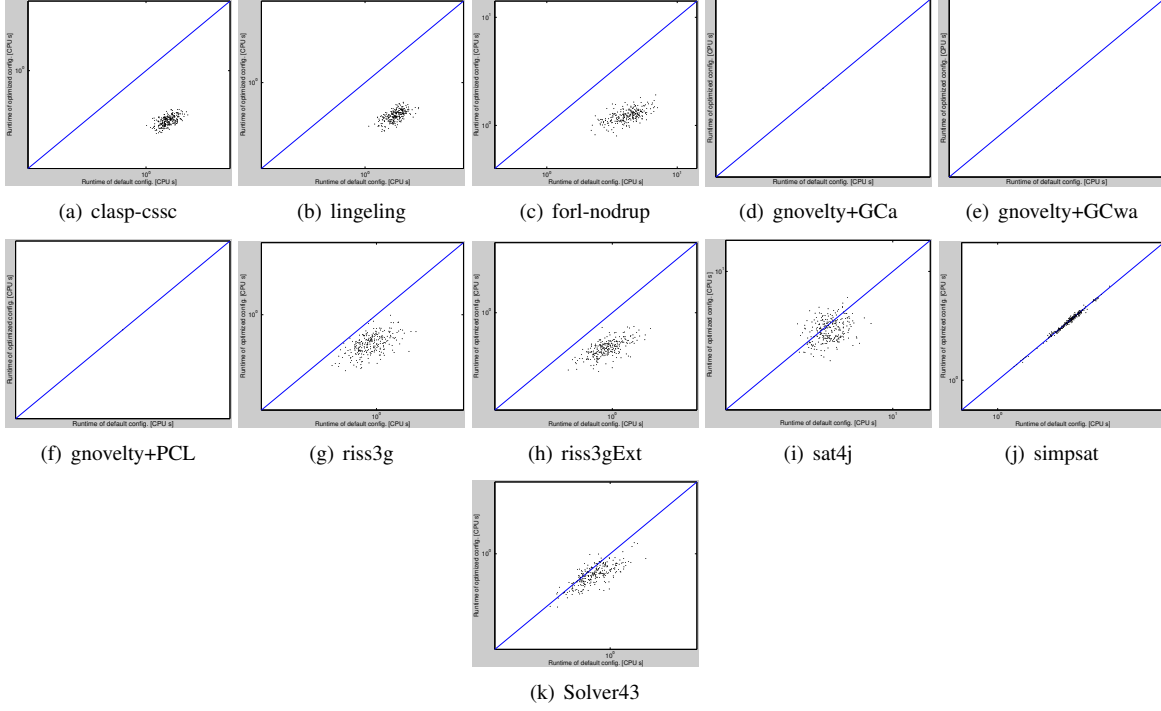


Figure 8: Default vs. optimized configurations of all solvers for benchmark CSSC-unsat-unif-k5-300s-2day.

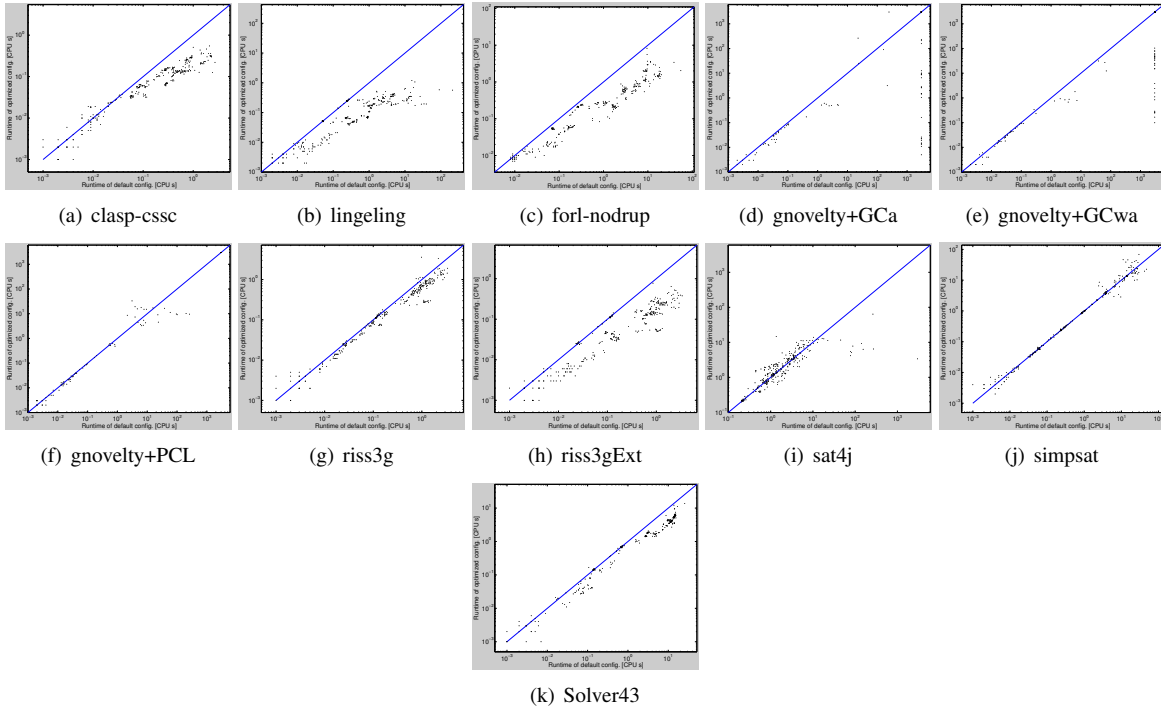


Figure 9: Default vs. optimized configurations of all solvers for benchmark CSSC-SWV-300s-2days.

4 Scatter Plots Default vs. Configured Performance for Each Solver

Figures 10 to 20 provide scatter plots of the performance of each solver with its default parameter settings vs. its configured parameter settings, for each solver in the CSSC 2013.

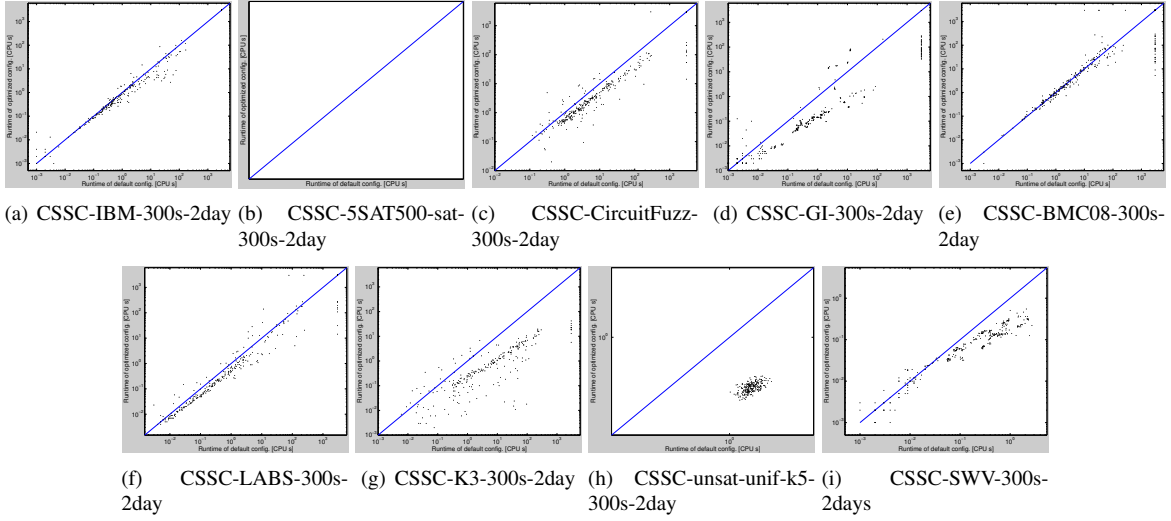


Figure 10: Default vs. optimized configurations for algorithm clasp-cssc on all benchmarks.

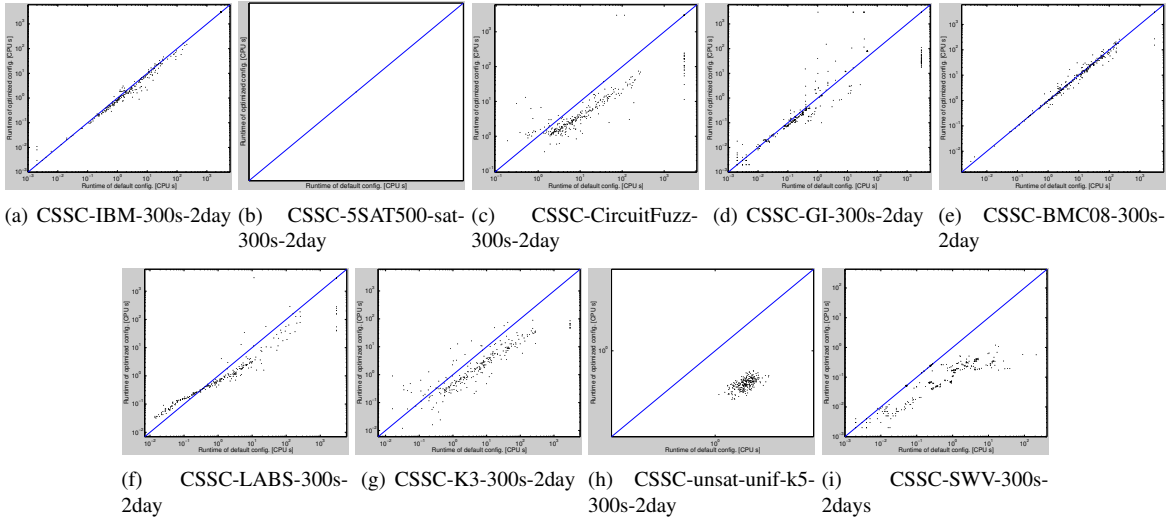


Figure 11: Default vs. optimized configurations for algorithm lingeling on all benchmarks.

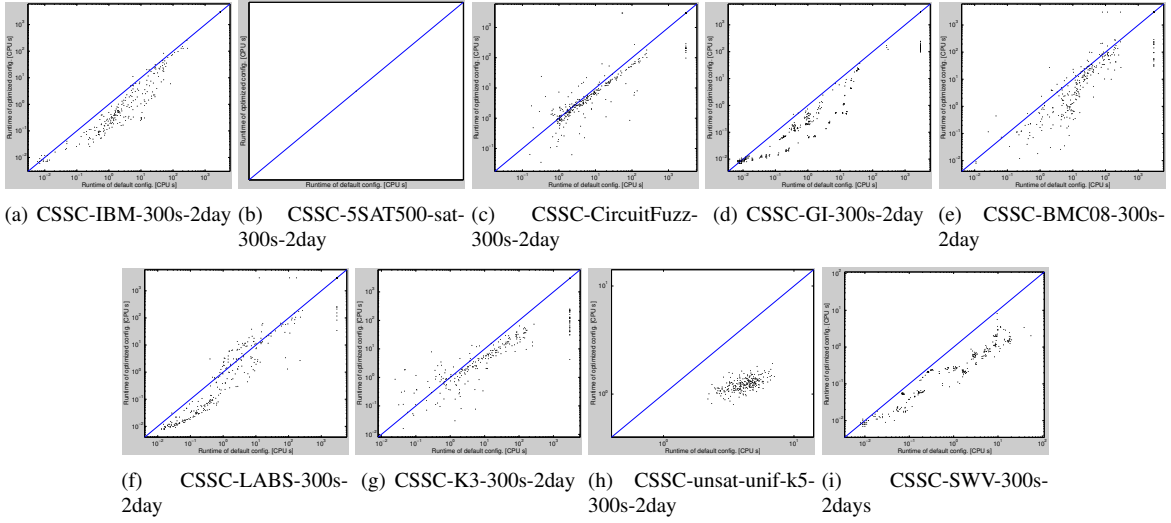


Figure 12: Default vs. optimized configurations for algorithm forl-nodrup on all benchmarks.

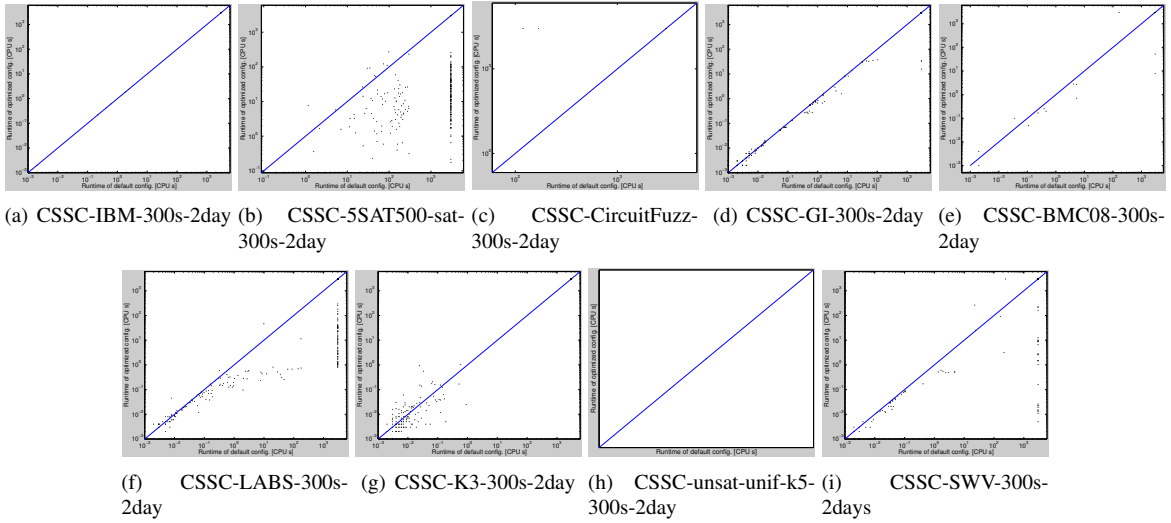


Figure 13: Default vs. optimized configurations for algorithm gnovelty+GCa on all benchmarks.

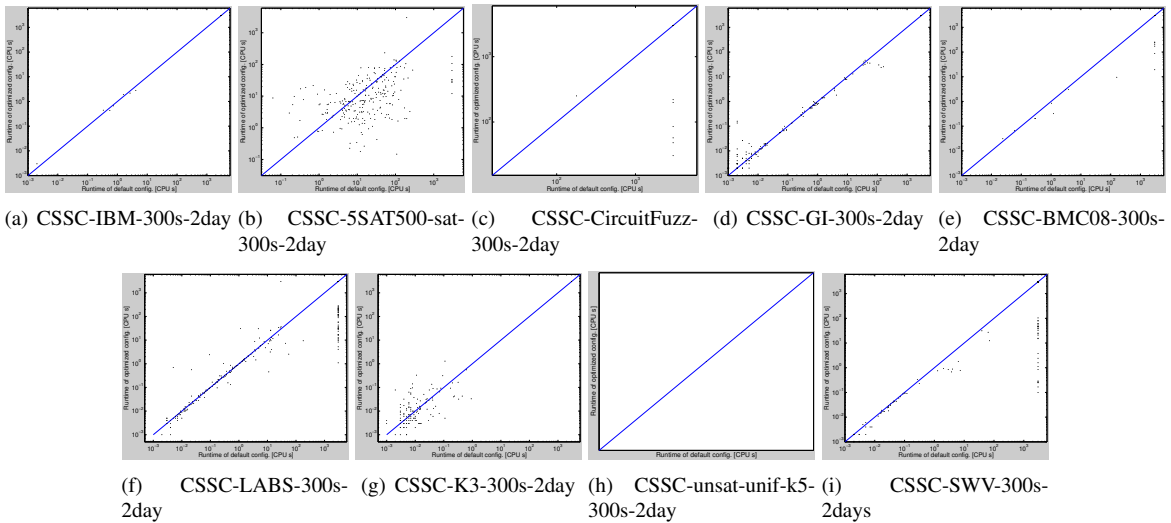


Figure 14: Default vs. optimized configurations for algorithm gnovelty+GCwa on all benchmarks.

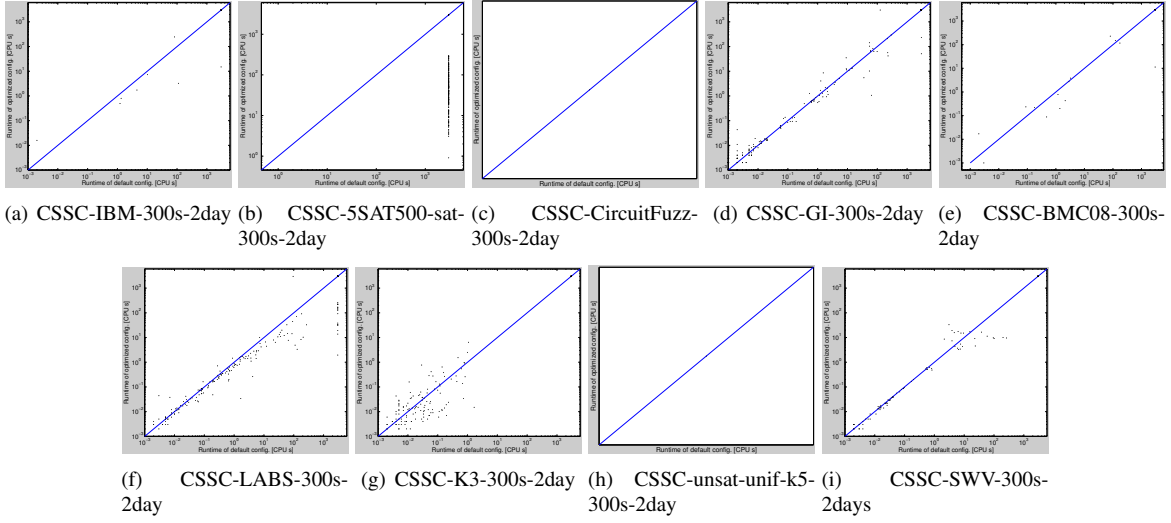


Figure 15: Default vs. optimized configurations for algorithm novelty+PCL on all benchmarks.

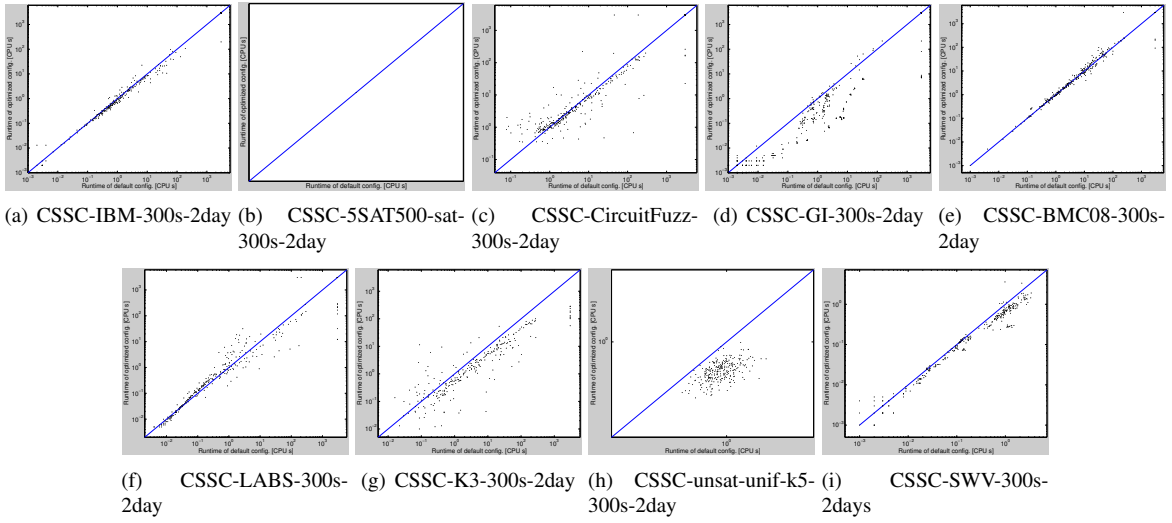


Figure 16: Default vs. optimized configurations for algorithm riss3g on all benchmarks.

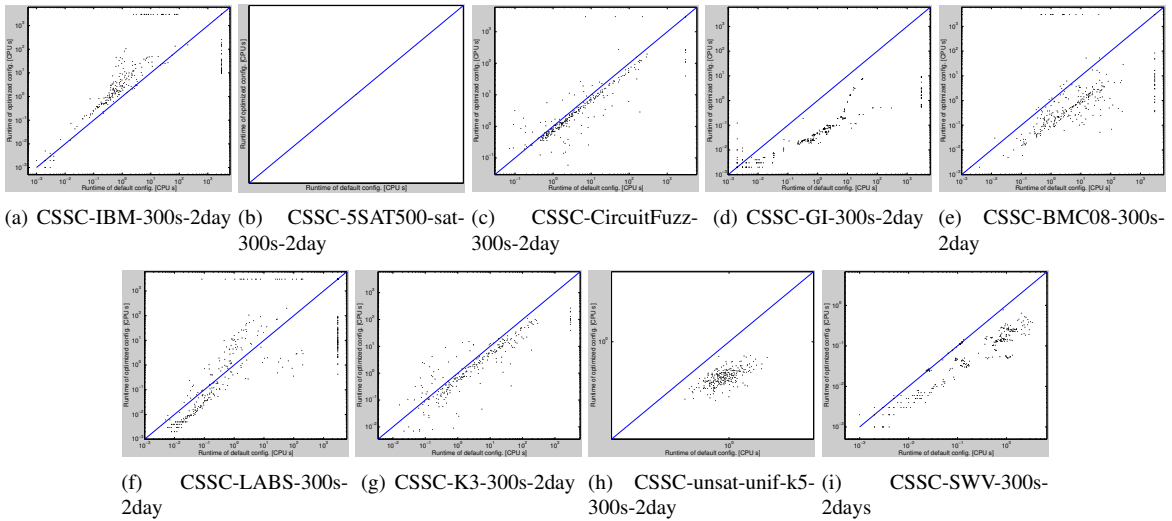
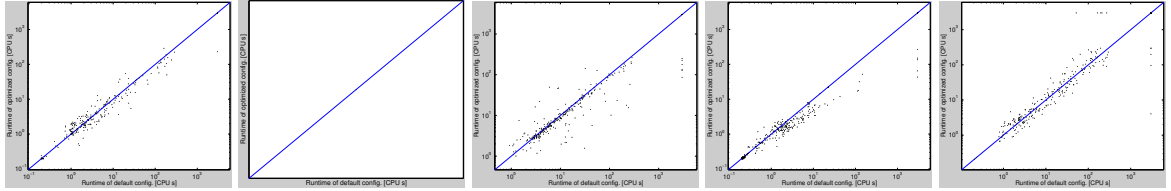
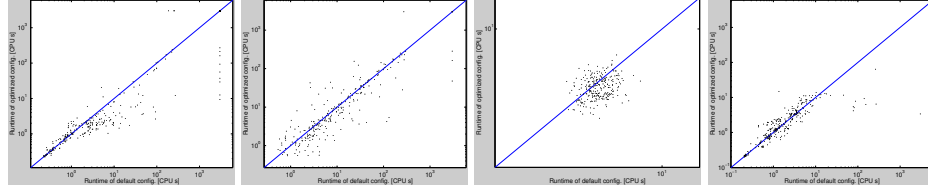


Figure 17: Default vs. optimized configurations for algorithm riss3gExt on all benchmarks.

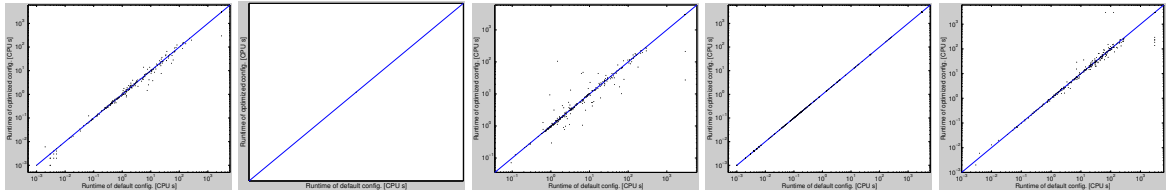


(a) CSSC-IBM-300s-2day (b) CSSC-5SAT500-sat-300s-2day (c) CSSC-CircuitFuzz-300s-2day (d) CSSC-GI-300s-2day (e) CSSC-BMC08-300s-2day

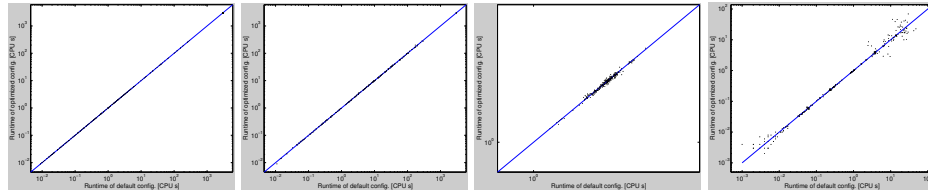


(f) CSSC-LABS-300s-2day (g) CSSC-K3-300s-2day (h) CSSC-unsat-unif-k5-300s-2day (i) CSSC-SWV-300s-2days

Figure 18: Default vs. optimized configurations for algorithm sat4j on all benchmarks.

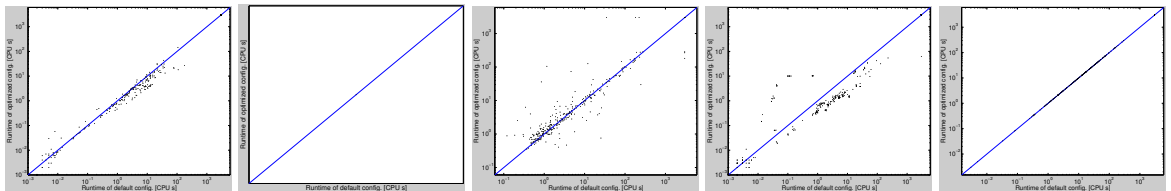


(a) CSSC-IBM-300s-2day (b) CSSC-5SAT500-sat-300s-2day (c) CSSC-CircuitFuzz-300s-2day (d) CSSC-GI-300s-2day (e) CSSC-BMC08-300s-2day

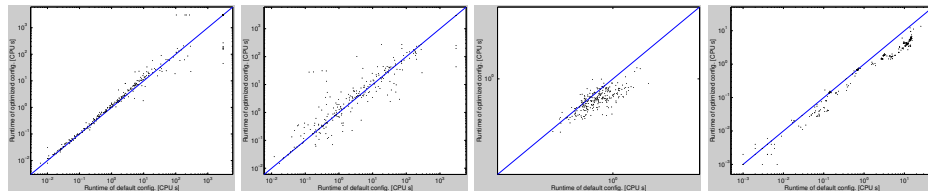


(f) CSSC-LABS-300s-2day (g) CSSC-K3-300s-2day (h) CSSC-unsat-unif-k5-300s-2day (i) CSSC-SWV-300s-2days

Figure 19: Default vs. optimized configurations for algorithm simpsat on all benchmarks.



(a) CSSC-IBM-300s-2day (b) CSSC-5SAT500-sat-300s-2day (c) CSSC-CircuitFuzz-300s-2day (d) CSSC-GI-300s-2day (e) CSSC-BMC08-300s-2day



(f) CSSC-LABS-300s-2day (g) CSSC-K3-300s-2day (h) CSSC-unsat-unif-k5-300s-2day (i) CSSC-SWV-300s-2days

Figure 20: Default vs. optimized configurations for algorithm Solver43 on all benchmarks.