

Rethinking AIG Resynthesis in Parallel

UPDATED RESULTS

The ABC experiments in the original paper were executed on the ABC patch mode CULS¹, which by default does not have the optimization flag enabled for the ABC code. Here, we re-run the main experiments of the paper on ABC built via the original method (i.e., using the Makefile) with the other experimental settings unchanged. The updated results are shown in Tables IV and V.

Comparing with Tables I and II in the original paper, the differences lie in the “Time” column of ABC *balance*, *drf*, *rf_resyn* and *resyn2*. The result quality of ABC and the GPU implementations, as well as the runtime of the GPU implementations are the same as those reported in the original paper.

TABLE IV: Updated results of single optimization algorithms.

Benchmarks	Statistics	ABC <i>balance</i>		GPU <i>b</i>		ABC <i>drf</i>		GPU <i>rf</i> (×2)	
	#Nodes / Levels	#Nodes / Levels	Time	#Nodes / Levels	Time	#Nodes / Levels	Time	#Nodes / Levels	Time
twentythree	23339737 / 176	17518692 / 104	38.7	17513406 / 104	1.8	18126777 / 117	381.3	18397973 / 103	10.7
twenty	20732893 / 162	15646118 / 94	37.8	15641552 / 94	1.6	16138461 / 110	338.0	16421342 / 95	9.2
sixteen	16216836 / 140	12250387 / 99	18.5	12246434 / 99	1.4	12617619 / 104	257.6	12911473 / 101	7.6
div_10xd	58620928 / 4372	58612736 / 4372	71.1	58598400 / 4372	20.1	57035776 / 4374	255.2	48779264 / 4422	20.5
hyp_8xd	54869760 / 24801	54869760 / 24801	66.6	54869760 / 24801	86.6	54539008 / 24801	227.9	54539008 / 24790	32.7
mem_ctrl_10xd	47960064 / 114	47959040 / 114	71.9	47959040 / 114	9.2	47592448 / 114	412.0	47444992 / 109	16.9
log2_10xd	32829440 / 444	32706560 / 410	30.3	32697344 / 410	5.0	31441920 / 425	175.4	31552512 / 396	7.9
multiplier_10xd	27711488 / 274	27599872 / 266	25.0	27599872 / 266	5.9	26664960 / 272	125.5	26565632 / 265	5.5
sqrt_10xd	25208832 / 5058	25204736 / 5058	23.0	25204736 / 5058	9.3	24033280 / 5063	117.6	24862720 / 5365	12.4
square_10xd	18927616 / 250	18748416 / 250	22.3	18740224 / 250	3.6	18142208 / 250	81.3	18081792 / 250	3.7
voter_10xd	14088192 / 70	13907968 / 70	13.4	13748224 / 70	3.4	11744256 / 62	56.4	11480064 / 66	2.5
sin_10xd	5545984 / 225	5521408 / 186	6.8	5516288 / 186	0.9	5342208 / 224	27.4	5357568 / 213	1.5
ac97_ctrl_10xd	14610432 / 12	14597120 / 11	26.8	14597120 / 11	2.8	11825152 / 12	90.5	11144192 / 12	3.4
vga_lcd_5xd	4054752 / 24	4053696 / 19	5.7	4053696 / 19	1.1	3236384 / 24	24.9	2952480 / 26	1.2
Geomean Ratio vs. ABC		1.000 / 1.000		0.999 / 1.000	6.0× accel.	1.000 / 1.000		0.983 / 0.980	20.4× accel.

TABLE V: Updated results of optimization sequences.

Benchmarks	ABC <i>rf_resyn</i>		GPU <i>rf_resyn</i>		ABC <i>resyn2</i>		GPU <i>resyn2</i> (rwz ×2)	
	#Nodes / Levels	Time	#Nodes / Levels	Time	#Nodes / Levels	Time	#Nodes / Levels	Time
twentythree	17396577 / 104	698.6	17348255 / 98	17.3	16931332 / 72	2615.8	16915942 / 68	55.2
twenty	15514368 / 94	631.9	15480873 / 90	15.2	15095643 / 65	2254.3	15079948 / 65	49.1
sixteen	12147445 / 99	470.8	12118520 / 99	13.2	11765351 / 68	1699.1	11757432 / 64	40.4
div_10xd	56788992 / 4404	1123.3	48652485 / 4373	104.7	41665780 / 4388	4160.0	41689305 / 4422	239.8
hyp_8xd	54539008 / 24785	1089.4	54539008 / 24787	345.2	54193719 / 24785	6258.9	54205696 / 24671	653.8
mem_ctrl_10xd	46615552 / 105	1530.5	47312818 / 108	54.7	43777052 / 92	4044.7	44821695 / 94	132.9
log2_10xd	31011840 / 366	703.2	31371816 / 390	34.3	29946093 / 358	2943.3	29966717 / 358	91.5
multiplier_10xd	26471424 / 265	451.1	26469376 / 265	33.0	24957961 / 262	2056.1	24949760 / 262	77.5
sqrt_10xd	23618560 / 5182	1255.7	23014400 / 5174	54.8	18884491 / 6020	2598.4	18800640 / 5928	131.5
square_10xd	17935360 / 250	316.2	17888256 / 250	22.9	17091593 / 248	1438.9	17052614 / 249	58.0
voter_10xd	9951232 / 59	181.1	10874377 / 63	14.6	8845336 / 66	823.1	8961831 / 60	33.2
sin_10xd	5285888 / 179	113.9	5319346 / 187	6.2	5156077 / 163	484.8	5158131 / 161	16.2
ac97_ctrl_10xd	10956800 / 11	315.7	11020147 / 9	13.5	10490213 / 10	794.2	10660403 / 10	32.0
vga_lcd_5xd	2918528 / 18	78.5	2946898 / 20	5.2	2903540 / 24	235.9	2903968 / 23	10.7
Geomean Ratio vs. ABC	1.000 / 1.000		0.996 / 1.000	18.1× accel.	1.000 / 1.000		1.003 / 0.982	26.4× accel.

¹<https://github.com/cuhk-eda/CULS>