

CSG GPU Boolean Evaluation in BRL-CAD

All scenes rendered with the view: azimuth 35, elevation 25 (az35, el25).

1. Time efficiency (seconds)

- a) 'rt' command
- b) 'rt -z1' command
- c) 'rt -z1 -l5' over trunk code:
 - count_hits kernel
 - store_segs kernel
- d) 'rt -z1 -l5' over trunk code:
 - count_hits kernel
 - store_segs kernel
 - shade_segs kernel
- e) 'rt -z1 -l5' over opengl branch code:
 - count_hits kernel
 - store_segs kernel
 - rt_boolweave kernel
- f) 'rt -z1 -l5' over opengl branch code:
 - count_hits kernel
 - store_segs kernel
 - rt_boolweave kernel
 - rt_boolfinal kernel
- g) 'rt -z1 -l5' over opengl branch code:
 - count_hits kernel
 - store_segs kernel
 - rt_boolweave kernel
 - rt_boolfinal kernel
 - shade_segs kernel

	a)	b)	c)	d)	e)	f)	g)
operators.g	0,055	0,012	0,021	0,021	0,027	0,032	0,029
boolean-ops.g	0,045	0,016	0,016	0,019	0,025	0,027	0,029
truck.g	0,052	0,012	0,031	0,033	0,044	0,083	0,078
tank_car.g	0,101	0,013	0,036	0,038	0,046	0,254	0,242
goliath.g	0,248	0,022	0,076	0,102	0,129	1,859	1,764
havoc.g	0,535	0,041	0,121	0,121	0,146	8,544	7,334

2. Memory (KBs)

512x512 grid

	operators.g	boolean-ops.g	truck.g	tank_car.g	goliath.g	havoc.g
clt_rand_half tab	64,59	64,59	64,59	64,59	64,59	64,59
clt_db_ids	0,03	0,00	0,18	0,77	3,83	2,37
clt_db_indexes	0,13	0,02	0,71	3,08	15,31	9,49
clt_db_prims	8,31	0,69	40,20	177,20	1018,44	642,40
clt_db_bvh	3,45	0,27	12,74	47,09	184,57	128,68
clt_db_regions	1,25	0,12	7,11	30,78	153,05	94,88
clt_db_rtree	0,41	0,02	2,78	14,30	60,12	125,56
clt_db_bool_regions	0,39	0,06	2,85	3,54	28,26	6,05
ppixels	768	768	768	768	768	768
pcounts	1024	1024	1024	1024	1024	1024
ph	1024	1024	1024	1024	1024	1024
psegs	35499	26801,72	68134,22	25337,81	85965,47	59883,75
ipartitions	1024	1024	1024	1024	1024	1024
ppartitions	70998,75	53603,44	136268,44	50675,62	171930,94	119767,50
segs_bv	986,09	744,49	1892,62	703,83	4775,86	4990,31
regiontable_bv	1024	1024	5120	6144	47104	10240
Total (KBs)	112426,4	86079,42	215386,44	87042,61	315144,44	199795,58
Total (MBs)	109,8	84,1	210,3	85	307,8	195,1

3. Other metrics

	Primitives	Regions	Segs	Partitions	Max Segs in Partition	Max regions involved in partition
operators.g	32	20	126220	82263/252440	2	2
boolean-ops.g	3	3	95295	54412/190590	3	3
truck.g	182	146	60528	14135/121170	6	9
tank-car.g	787	180	40893	57482/81786	10	44
goliath.g	3918	1447	258904	326044/517808	17	23
havoc.g	2427	308	212920	290797/425840	20	23