tide dense

Lucy Score = Throughput x Availability x Acc / 10,000. LPD condenses live-fit vs Acc-champ RAM.
[T]=Tween [S]=Split [FP]=FastProxy [L]=Linear [HP]=HeadProxy
done - epoch 1/1 (1 left, 100% overall) - lr unset - 2026-08-23 13:32:49 -
This epoch 2346 / 2346 cells. Recorded 2346 results. Learning rate unset.
Score 0 usually means the cell finished before a Lucy pulse (Acc never sampled). Score is live-fit: Throughput x Availability x Acc.
SGD that blocks serve dies on Availability. SoftAcc is serve-confidence only.
pi_collection - dense - offline report

Lucy champions (this tide)

Axis	Cell	Score	Soft	Acc	Thru	Avail
hard acc	uint6|none|[T][S]Sparse|single|simd	5773.21	25.3	29.6	40226.2	56.6
throughput	float32|none|step_sgd|single|simd	15385.26	25.0	27.2	143816.2	42.8
availability	fp8e4m3|none|[T][S]Sparse|bicameral|simd	2665.04	25.0	30.1	17416.5	61.2
lucy score	fp4|none|tween_chain|single|simd	16344.00	25.0	25.0	139566.6	46.8
mobile score (trap)	binary|none|Mesh[T]Chain|single|simd	15402.20	25.0	26.9	127017.1	48.5
t->50%	fp8e5m2|none|sgd|single|simd	8201.85	25.0	26.4	92762.0	35.4
acc/sec	ternary|none|step_sgd|single|simd	12531.05	25.1	28.2	126230.6	39.5

Lucy axis champions (this tide)

Axis	Mode	DType	Arch	Value
hard_acc	Mesh[T][S][FP]	complex128	tricameralx3	41.51
throughput	step_sgd	float32	singlex1	143816.18
availability	[T][S]Sparse	fp8e4m3	bicameralx2	61.21
score	tween_chain	fp4	singlex1	16344.00
soft_acc	[T][S]Sparse	uint6	singlex1	25.34
acc_thru	tween	float32	singlex1	39916.72
realtime	tween_chain	fp4	singlex1	65375.99
adapt	[T][S][HP]	binary	singlex1	25.31
keep_learn	sgd	int2	singlex1	13.74
acc_per_sec	step_sgd	ternary	singlex1	12.52
time_to_50	sgd	fp8e5m2	singlex1	1.91
consistency	sgd	float64	singlex1	100.00
stability	sgd	fp4	bicameralx2	100.00
mobile_score	Mesh[T]Chain	binary	singlex1	40375931~
lpd	step_tween_chain	ternary	singlex1	26.72
mspeed	tween_chain	bfloat16	singlex1	1.00
mavail	[T][S]Sparse	fp8e4m3	bicameralx2	1.00
mix	step_tween_chain	ternary	singlex1	0.83
gold_std	[T]Alt	uint3	singlex1	0.02

Best settings per train mode

Mode	DType	Format	Score	Soft	Acc	Avail	n
tween_chain	fp4	none	16344.0	25.0	25.0	46.8	102
[T][S][L]	float32	none	16299.0	25.1	28.2	47.3	102
step_tween	float32	none	16209.6	24.9	26.0	46.9	102
step_tween_chain	float32	none	16021.0	25.0	27.6	46.0	102
tween	fp4	none	15890.3	25.0	25.0	46.1	102
Mesh[T]Chain	fp4	none	15804.1	25.0	24.9	46.8	102
step_sgd	float32	none	15385.3	25.0	27.2	42.8	102
Mesh[T]	int8	none	15374.0	25.0	23.9	47.8	102
Step[T][S]	fp4	none	15280.2	25.0	24.9	46.9	102

MeshBP	ternary	none	14425.2	25.1	26.3	45.6	102
[T][S][FP]	float32	none	13661.9	25.1	25.8	45.7	102
[T]Alt	float32	none	13310.9	25.0	27.8	47.2	102
sgd	uint8	none	12278.3	25.0	25.6	37.5	102
[T][S][L]Cache	fp4	none	12112.0	25.0	24.4	46.6	102
[T][S][HP]Async	float32	none	10507.1	25.0	28.6	46.6	102
[T][S]Sparse	float32	none	10078.4	24.7	27.0	48.7	102
Step[T]Alt	uint8	none	10003.7	25.0	27.2	48.7	102
[T][S]	uint2	none	9947.9	25.2	27.7	46.5	102
[T][S][HP]	float32	none	9376.5	24.9	24.7	45.9	102
Mesh[T][S]	fp4	none	8466.4	25.0	25.4	46.0	102
Mesh[T]Alt	float32	none	7527.8	24.9	27.8	45.9	102
Mesh[T][S][FP]	float32	none	7131.6	24.8	21.5	46.0	102
Mesh[T][S]Sparse	float32	none	6670.2	25.1	26.6	46.6	102

Best dtype per mode

Mode	Winner dtype	Score	Soft	Acc
tween_chain	fp4	16344.0	25.0	25.0
[T][S][L]	float32	16299.0	25.1	28.2
step_tween	float32	16209.6	24.9	26.0
step_tween_chain	float32	16021.0	25.0	27.6
tween	fp4	15890.3	25.0	25.0
Mesh[T]Chain	fp4	15804.1	25.0	24.9
step_sgd	float32	15385.3	25.0	27.2
Mesh[T]	int8	15374.0	25.0	23.9
Step[T][S]	fp4	15280.2	25.0	24.9
MeshBP	ternary	14425.2	25.1	26.3
[T][S][FP]	float32	13661.9	25.1	25.8
[T]Alt	float32	13310.9	25.0	27.8
sgd	uint8	12278.3	25.0	25.6
[T][S][L]Cache	fp4	12112.0	25.0	24.4
[T][S][HP]Async	float32	10507.1	25.0	28.6
[T][S]Sparse	float32	10078.4	24.7	27.0
Step[T]Alt	uint8	10003.7	25.0	27.2
[T][S]	uint2	9947.9	25.2	27.7
[T][S][HP]	float32	9376.5	24.9	24.7
Mesh[T][S]	fp4	8466.4	25.0	25.4
Mesh[T]Alt	float32	7527.8	24.9	27.8
Mesh[T][S][FP]	float32	7131.6	24.8	21.5
Mesh[T][S]Sparse	float32	6670.2	25.1	26.6

Best mode per dtype

DType	Winner mode	Score	Soft	Acc
fp4	tween_chain	16344.0	25.0	25.0
float32	[T][S][L]	16299.0	25.1	28.2
binary	Mesh[T]Chain	15402.2	25.0	26.9
int8	Mesh[T]	15374.0	25.0	23.9
ternary	step_tween_chain	15360.9	25.1	30.0
int2	Mesh[T]	15160.6	25.1	22.6
int4	tween_chain	15150.4	25.1	25.5
uint8	tween	14941.6	25.0	25.5
bfloat16	[T][S][L]	14627.3	24.8	26.2

fp8e5m2	Mesh[T]	14333.1	25.0	28.1
fp8e4m3	tween	14241.2	25.0	22.8
float16	step_tween_chain	14212.3	25.0	25.0
uint32	Mesh[T]	13936.8	25.1	26.5
uint16	tween_chain	13686.9	25.0	25.7
float64	step_tween_chain	13582.3	25.0	27.2
uint64	tween	13544.5	25.0	25.8
uint4	tween	13380.9	25.1	25.5
uintptr	tween_chain	13243.2	25.0	26.3
int32	tween_chain	13156.8	25.0	25.2
uint2	tween	13051.6	25.1	30.7
uint	tween_chain	13034.3	25.0	26.0
int16	Mesh[T]Chain	12885.2	24.9	25.5
int64	tween_chain	12715.0	25.0	27.1
complex128	tween	12638.0	25.1	26.0
complex64	step_tween	12594.4	25.0	27.1
nf4	MeshBP	12085.4	25.0	28.4
int	tween	11834.6	25.0	26.9
uint3	tween_chain	11729.7	24.9	23.7
int3	tween_chain	10798.5	25.0	26.0
uint5	MeshBP	10237.1	25.0	26.3
int5	tween	9581.8	25.0	21.7
uint6	tween	9441.5	25.0	25.9
int6	MeshBP	8954.5	25.0	24.8
fp6	[T][S][L]	8689.3	25.0	31.9

Leaderboard (Lucy Score)

#	Cell	Score	Soft	Acc	Thru	Avail
1	fp4|none|tween_chain|single|simd	16344.0	25.0	25.0	139566.6	46.8
2	float32|none|[T][S][L]|single|simd	16299.0	25.1	28.2	137541.1	47.3
3	float32|none|step_tween|single|simd	16209.6	24.9	26.0	138649.5	46.9
4	float32|none|step_tween_chain|single|simd	16021.0	25.0	27.6	139643.1	46.0
5	fp4|none|tween|single|simd	15890.3	25.0	25.0	137889.4	46.1
6	fp4|none|Mesh[T]Chain|single|simd	15804.1	25.0	24.9	134953.5	46.8
7	float32|none|tween|single|simd	15751.6	25.0	28.4	140631.8	44.8
8	binary|none|Mesh[T]Chain|single|simd	15402.2	25.0	26.9	127017.1	48.5
9	float32|none|step_sgd|single|simd	15385.3	25.0	27.2	143816.2	42.8
10	int8|none|Mesh[T]|single|simd	15374.0	25.0	23.9	128796.2	47.8
11	ternary|none|step_tween_chain|single|simd	15360.9	25.1	30.0	122094.5	50.1
12	fp4|none|Step[T][S]|single|simd	15280.2	25.0	24.9	130294.4	46.9
13	fp4|none|step_tween|single|simd	15244.7	25.0	25.2	131688.1	46.3
14	int8|none|step_tween_chain|single|simd	15244.0	25.0	24.8	127467.3	47.9
15	int8|none|tween|single|simd	15242.3	25.0	26.2	133186.8	45.8
16	int2|none|Mesh[T]|single|simd	15160.6	25.1	22.6	123024.9	49.1
17	int4|none|tween_chain|single|simd	15150.4	25.1	25.5	130934.9	46.2
18	binary|none|tween|single|simd	15134.7	24.8	24.0	130195.3	46.9
19	fp4|none|[T][S][L]|single|simd	15066.3	25.0	23.4	129208.9	46.6
20	int2|none|tween|single|simd	15022.9	25.0	27.3	129925.3	46.2

Leaderboard (SoftAcc)

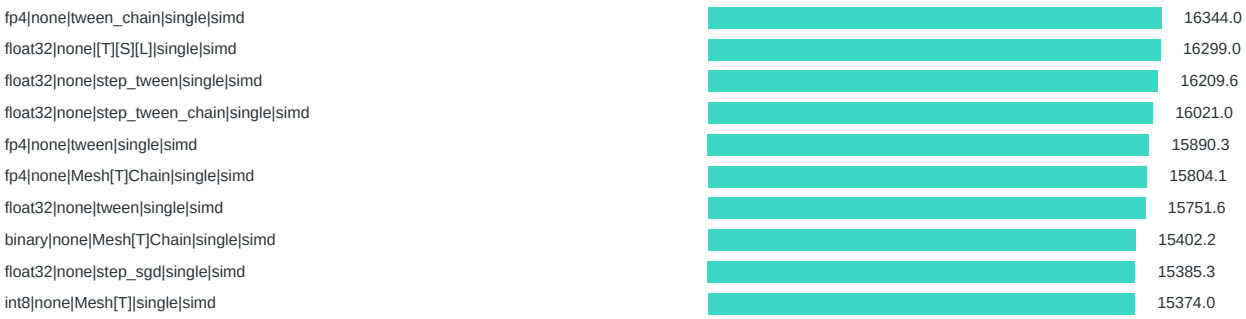
#	Cell	Score	Soft	Acc	Thru	Avail
1	ternary|none|Step[T][S]|single|simd	14851.2	25.2	23.9	122116.3	48.3

2	uint8|none|[T][S][L]|single|simd	14876.8	25.1	25.2	124150.8	47.7
3	binary|none|Step[T][S]|single|simd	14607.8	25.1	24.9	120976.7	48.0
4	ternary|none|Mesh[T]Chain|single|simd	14899.5	25.1	24.4	124709.2	47.6
5	ternary|none|step_tween_chain|single|simd	15360.9	25.1	30.0	122094.5	50.1
6	int2|none|Mesh[T]|single|simd	15160.6	25.1	22.6	123024.9	49.1
7	int4|none|[T][S][L]|single|simd	14469.0	25.1	25.9	123115.3	46.8
8	int4|none|step_tween_chain|single|simd	14488.6	25.1	27.2	120791.4	47.9
9	int4|none|tween_chain|single|simd	15150.4	25.1	25.5	130934.9	46.2
10	float32|none|[T][S][L]|single|simd	16299.0	25.1	28.2	137541.1	47.3
11	int2|none|[T][S][L]|single|simd	14726.0	25.0	25.4	120928.7	48.6
12	int2|none|step_tween_chain|single|simd	14745.2	25.0	26.3	121907.2	48.3
13	int2|none|tween|single|simd	15022.9	25.0	27.3	129925.3	46.2
14	uint8|none|tween|single|simd	14941.6	25.0	25.5	129074.3	46.3
15	binary|none|Mesh[T]Chain|single|simd	15402.2	25.0	26.9	127017.1	48.5
16	uint8|none|step_tween|single|simd	14679.0	25.0	25.8	122207.7	48.0
17	int8|none|tween|single|simd	15242.3	25.0	26.2	133186.8	45.8
18	int4|none|Mesh[T]Chain|single|simd	15015.7	25.0	25.8	128139.5	46.8
19	float32|none|tween|single|simd	15751.6	25.0	28.4	140631.8	44.8
20	fp4|none|tween_chain|single|simd	16344.0	25.0	25.0	139566.6	46.8

Leaderboard (hard Acc)

#	Cell	Score	Soft	Acc	Thru	Avail
1	ternary|none|step_tween_chain|single|simd	15360.9	25.1	30.0	122094.5	50.1
2	float32|none|tween|single|simd	15751.6	25.0	28.4	140631.8	44.8
3	float32|none|[T][S][L]|single|simd	16299.0	25.1	28.2	137541.1	47.3
4	float32|none|step_tween_chain|single|simd	16021.0	25.0	27.6	139643.1	46.0
5	int2|none|tween|single|simd	15022.9	25.0	27.3	129925.3	46.2
6	int4|none|step_tween_chain|single|simd	14488.6	25.1	27.2	120791.4	47.9
7	float32|none|step_sgd|single|simd	15385.3	25.0	27.2	143816.2	42.8
8	binary|none|Mesh[T]Chain|single|simd	15402.2	25.0	26.9	127017.1	48.5
9	int2|none|step_tween_chain|single|simd	14745.2	25.0	26.3	121907.2	48.3
10	bfloat16|none|[T][S][L]|single|simd	14627.3	24.8	26.2	121830.2	48.4
11	int8|none|tween|single|simd	15242.3	25.0	26.2	133186.8	45.8
12	float32|none|step_tween|single|simd	16209.6	24.9	26.0	138649.5	46.9
13	int4|none|[T][S][L]|single|simd	14469.0	25.1	25.9	123115.3	46.8
14	uint8|none|step_tween|single|simd	14679.0	25.0	25.8	122207.7	48.0
15	int4|none|Mesh[T]Chain|single|simd	15015.7	25.0	25.8	128139.5	46.8
16	uint8|none|tween|single|simd	14941.6	25.0	25.5	129074.3	46.3
17	int4|none|tween_chain|single|simd	15150.4	25.1	25.5	130934.9	46.2
18	int2|none|[T][S][L]|single|simd	14726.0	25.0	25.4	120928.7	48.6
19	int8|none|tween_chain|single|simd	14630.4	25.0	25.4	130928.0	44.7
20	uint8|none|[T][S][L]|single|simd	14876.8	25.1	25.2	124150.8	47.7

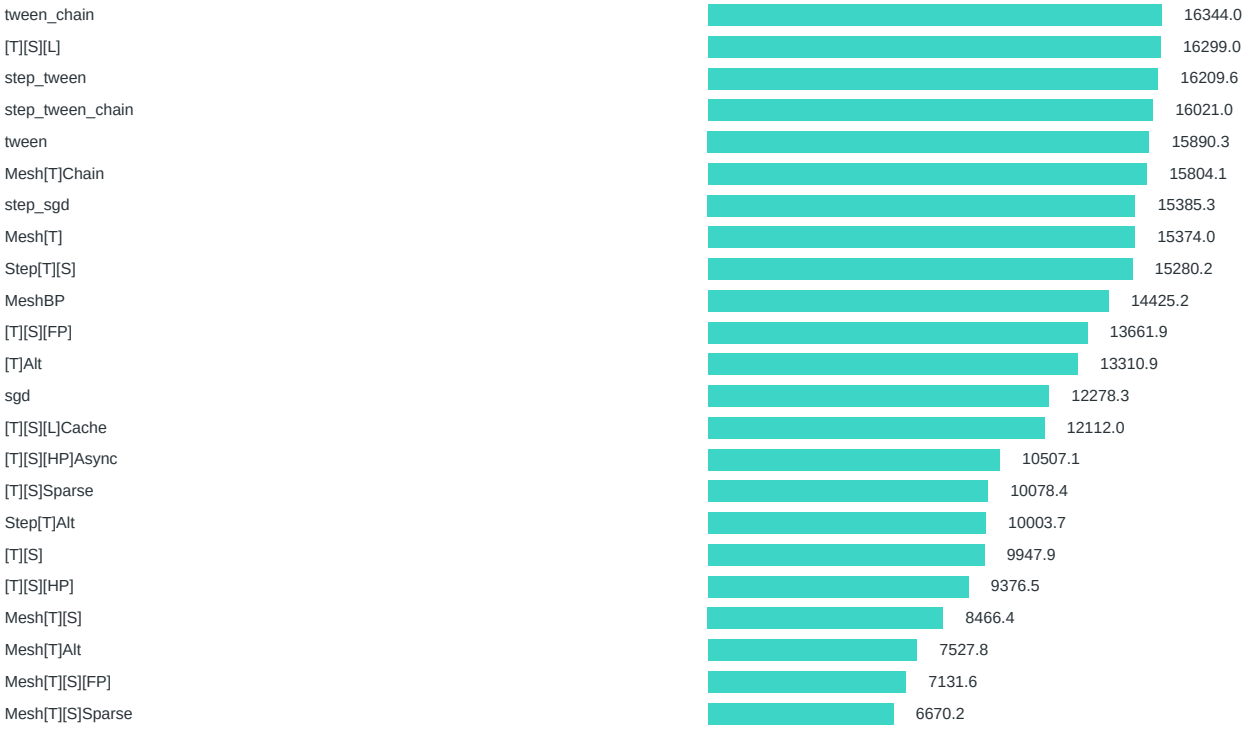
Top scores



ternary|none|step_tween_chain|single|simd



Best settings per mode



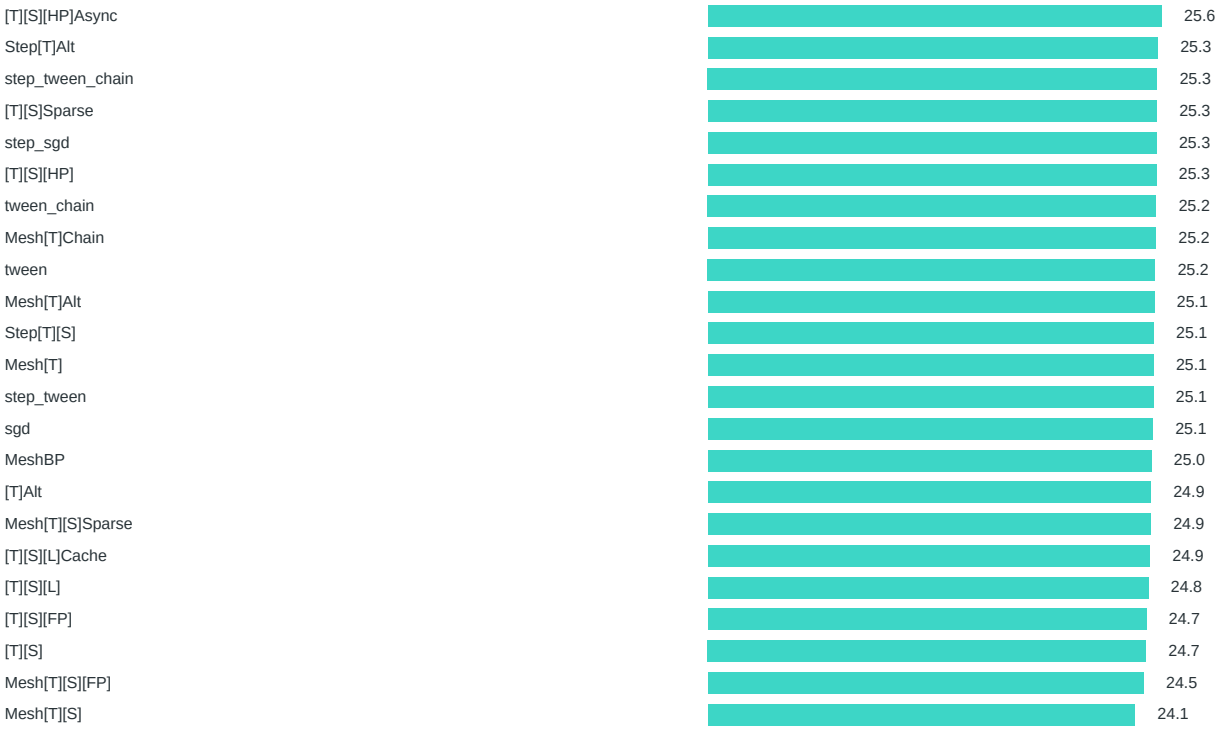
Mean Score by train mode



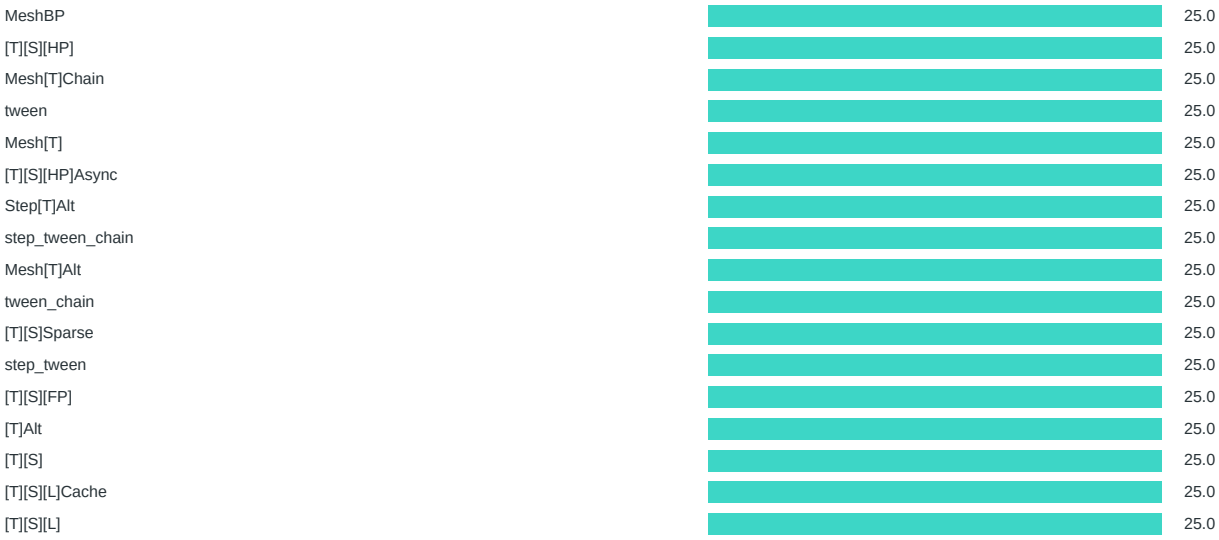




Mean hard Acc by train mode



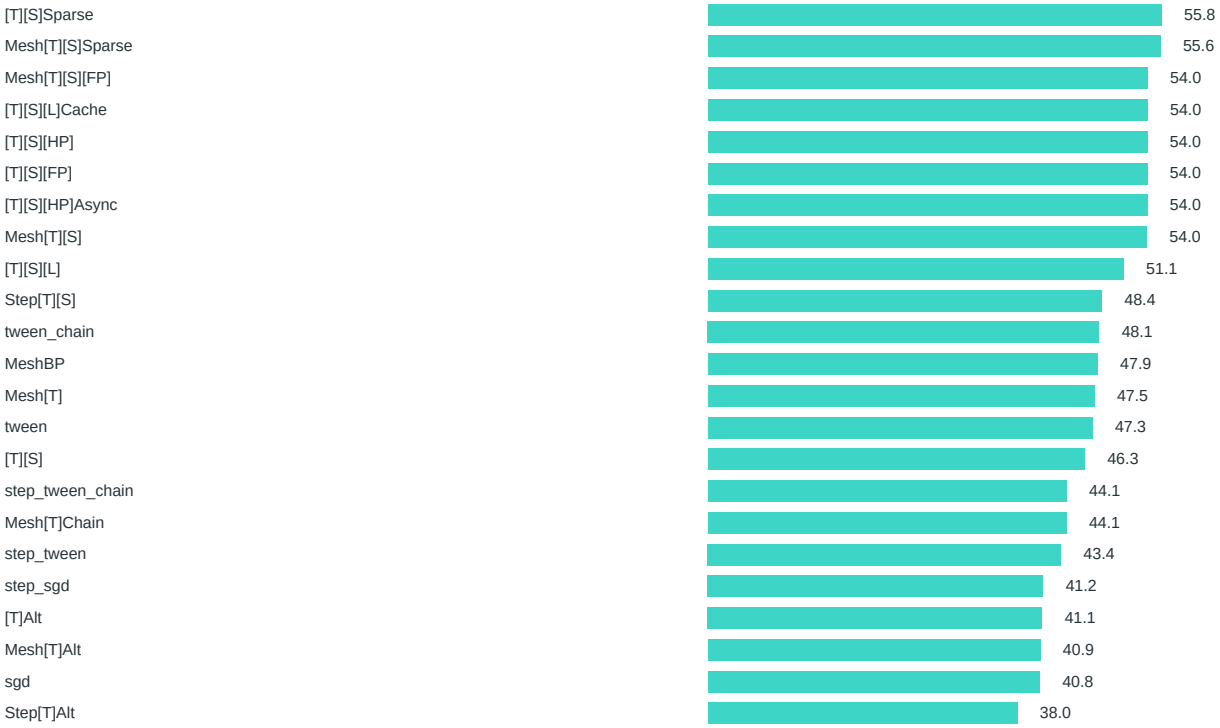
Mean SoftAcc by train mode



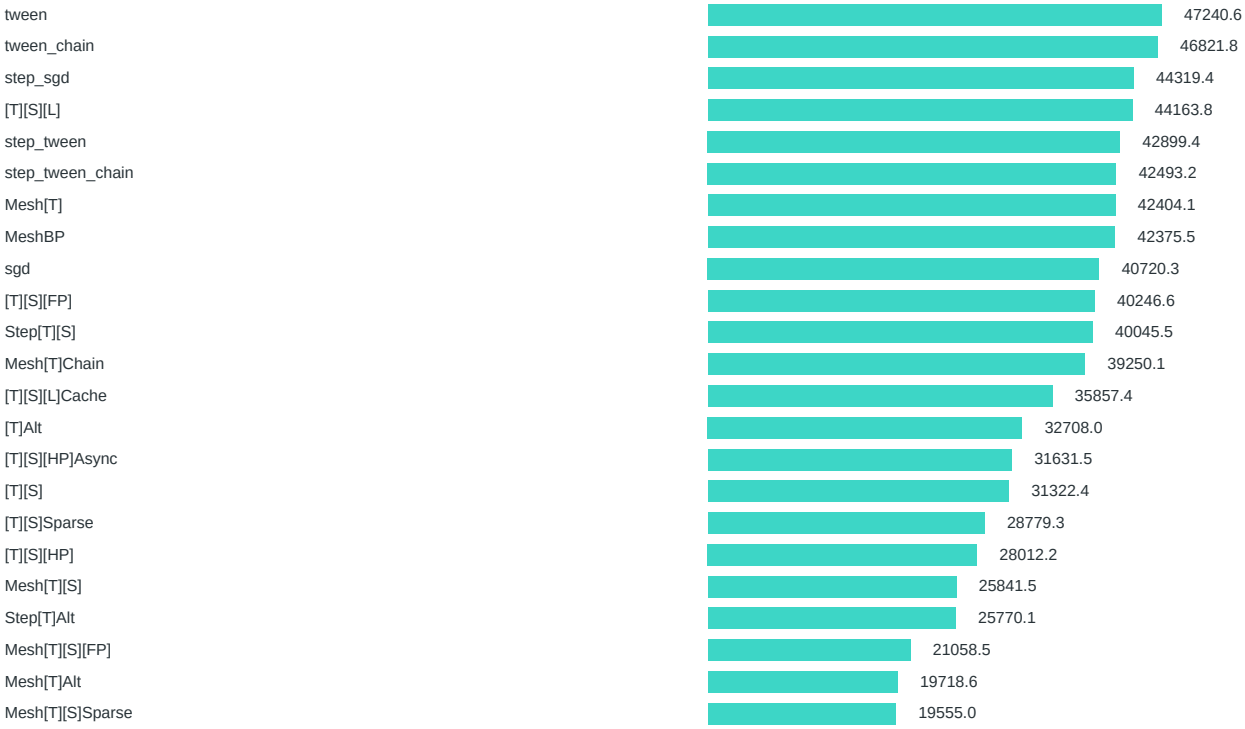
Step[T][S]



Mean Availability by train mode



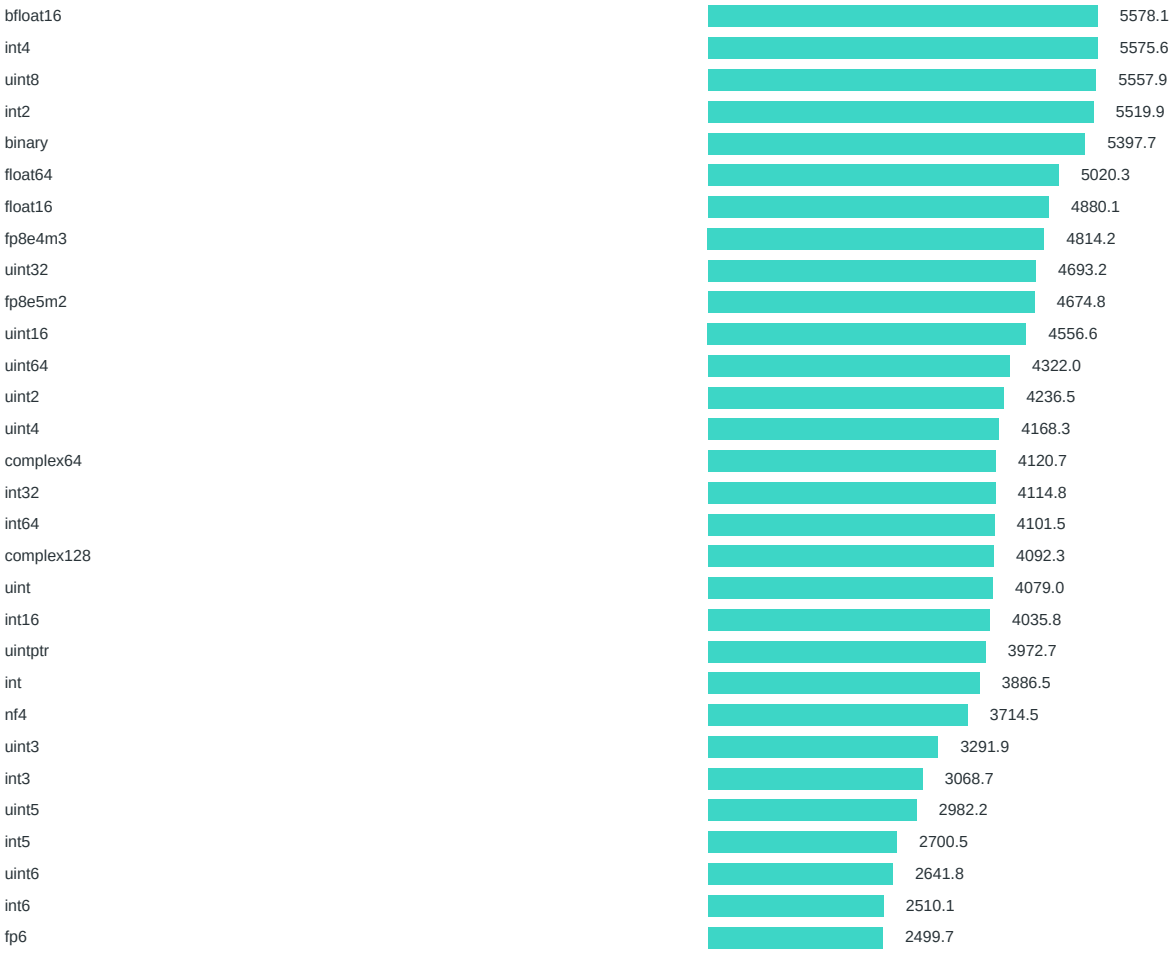
Mean Throughput by train mode



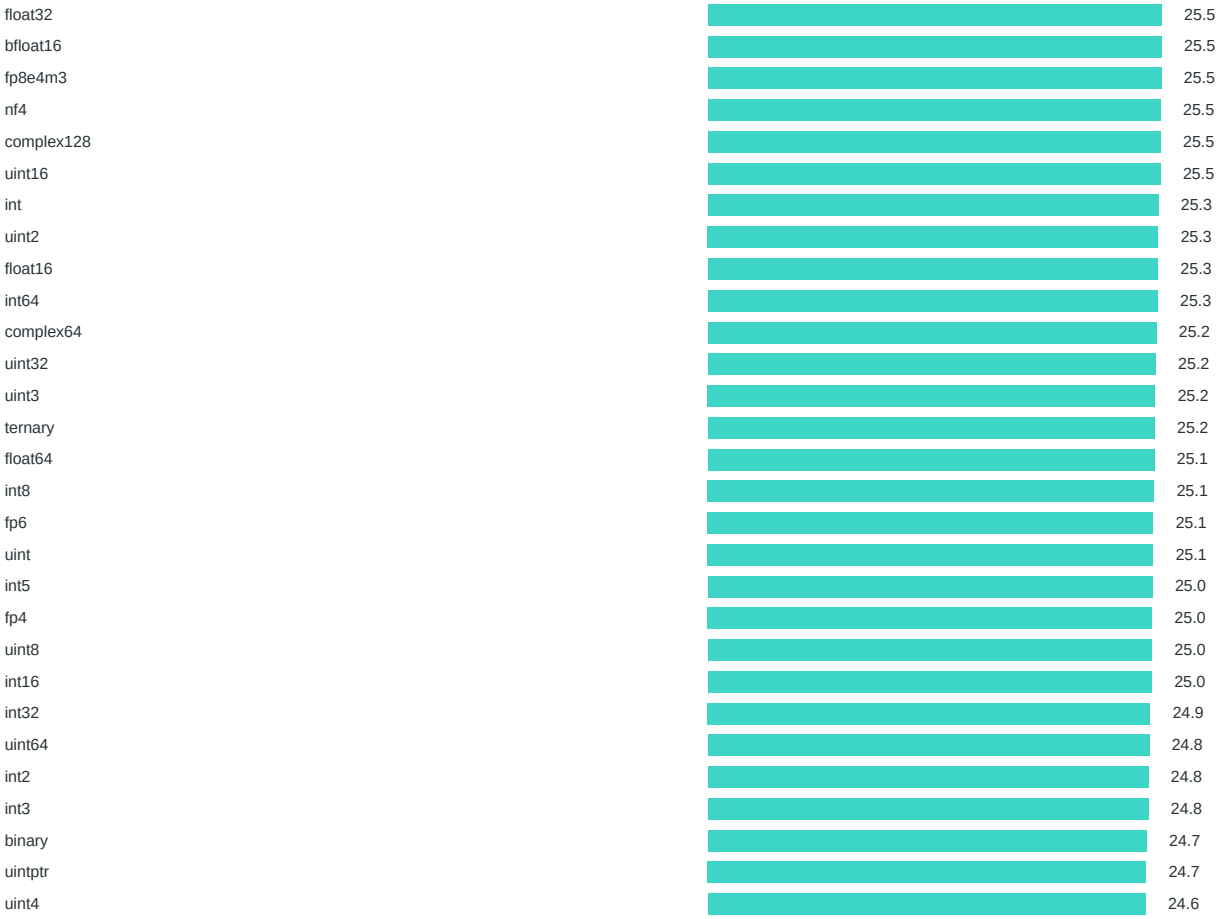
Mean Score by dtype



Mean Score by dtype



Mean hard Acc by dtype



Mean hard Acc by dtype



Mean Score by arch



Honesty - mean Score, every mode x dtype (cols 1-12)

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	7512	6200	5375	4921	6282	7762	6631	6644	2846	5844	5659	4286
Mesh[T]	6709	7665	4689	5205	6440	6646	5687	6963	2709	6347	7146	4503
Mesh[T]Alt	3183	3082	2152	2005	2323	3836	2951	2990	1336	3010	2136	2366
Mesh[T]Chain	5985	6880	5313	4677	5286	6709	5384	6159	2879	4680	4887	4433
Mesh[T][S]	4195	3549	2640	3191	3824	4632	3485	4341	2031	3425	3650	2807
Mesh[T][S][FP]	3183	3210	2516	2638	2865	3372	2536	3742	1135	2998	3434	2261
Mesh[T][S]Sparse	3137	2827	2569	2320	3318	4232	3100	3378	1331	2616	3011	1904
Step[T]Alt	4154	4452	2762	2963	3094	3773	3869	3721	1635	3913	2486	2591
Step[T][S]	5049	6908	5295	4950	4220	6785	4790	7436	3027	4876	5431	4736
[T]Alt	4844	3915	3593	3953	4746	6900	5271	5030	1793	3965	4685	3145
[T][S]	4240	4048	3874	3392	3525	5171	3726	3600	1786	3509	3368	3069
[T][S][FP]	7902	6772	3951	5232	5784	7797	4990	6467	3361	5425	5179	5406
[T][S][HP]	4220	6337	3601	3605	4203	5259	4708	4634	2255	3758	3782	3391
[T][S][HP]Async	5939	5590	3830	3695	4372	6667	4310	5319	2290	4582	3648	3635
[T][S][L]	7518	6375	5877	4871	6413	8606	7357	7432	4249	6898	5180	5135
[T][S][L]Cache	4678	4894	3793	3543	5080	6918	6311	6224	2493	5897	6022	4211
[T][S]Sparse	5426	3575	3342	3400	4289	6243	3602	5186	2555	4560	3446	3496
sgd	5083	4721	4100	3798	4368	6160	5110	4715	2533	3669	4307	3542
step_sgd	6534	6129	4536	4601	5382	8123	5798	6495	2812	5183	5684	4472
step_tween	6393	5559	4919	5151	6149	8542	5836	6953	3173	6673	5240	4783
step_tween_chain	7069	6460	4361	5109	6144	8595	6449	6788	2807	5870	6159	4317
tween	7379	7646	5347	5553	7042	9293	6735	7581	3300	6266	6200	5289
tween_chain	7965	7353	5688	6004	7093	7480	6831	7773	3157	6764	6781	5611

Honesty - mean Score, every mode x dtype (cols 13-24)

Honesty - mean Score, every mode x dtype (cols 13-24)

	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	4808	6392	3595	5419	6051	3064	3346	5960	6771	5446	7319	4763
Mesh[T]	5382	6538	3444	5543	7305	2579	2692	4791	7244	3887	6971	4846
Mesh[T]Alt	2036	2871	1502	2484	2996	1627	1330	2432	2907	1625	2577	2134
Mesh[T]Chain	5482	4835	4132	4305	6312	2998	3094	4386	6377	4416	5849	5036
Mesh[T][S]	2735	3226	2432	2342	3894	2362	1765	2547	4009	3078	3385	2627
Mesh[T][S][FP]	3354	3678	1743	2523	2799	1627	1806	2583	3722	2428	3566	3036
Mesh[T][S]Sparse	2464	3343	2018	2069	3277	1509	1249	2560	3180	2416	3135	1999
Step[T]Alt	3035	4402	1753	3054	3359	1469	1443	2994	3927	2047	4316	2478
Step[T][S]	3434	5751	4157	4296	7179	3203	2704	3256	4787	5323	7429	4595
[T]Alt	3481	5663	2054	3770	4644	2265	2111	3488	4899	3023	5859	3316
[T][S]	2845	4251	3099	2828	4924	2866	3061	3499	3842	2859	4969	3679
[T][S][FP]	5638	5999	3685	6092	7771	3456	2939	4328	7683	3975	5451	4320
[T][S][HP]	3422	4471	2729	3448	4633	2551	2355	3301	5599	2927	4445	3521
[T][S][HP]Async	4818	5772	3326	3706	4766	3807	2228	3633	5827	3003	4734	5213
[T][S][L]	4282	8326	3662	4683	7105	3363	3476	5951	7353	3784	6646	5195
[T][S][L]Cache	4365	6201	3596	3879	6183	2849	2887	5482	6729	4199	5508	4279
[T][S]Sparse	4295	4682	2774	3507	4694	1910	2074	3871	5309	3963	6285	4231
sgd	1630	5168	3019	3700	5338	3250	2485	3839	3067	4277	4791	4092
step_sgd	4350	6416	3269	4734	5512	2818	2533	4775	5178	3404	6718	4212
step_tween	5112	6645	3510	5317	7425	3317	2855	4124	7511	4532	6429	4335
step_tween_chain	5077	7329	3108	5587	7079	2478	2891	5323	7350	4168	8058	4769
tween	5454	8252	3609	5652	7340	3280	2942	5306	8025	5640	7572	5464
tween_chain	5324	6746	4365	5703	7653	3462	3463	5906	7879	5012	7468	5674

Honesty - mean Score, every mode x dtype (cols 25-34)

Honesty - mean Score, every mode x dtype (cols 25-34)

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	5688	4225	3845	5630	4975	3993	3346	5974	6738	5099
Mesh[T]	5777	4638	3614	6117	5494	4321	3126	5032	7155	5122
Mesh[T]Alt	1909	2774	1713	2502	2927	1450	1193	2480	3566	2198
Mesh[T]Chain	5569	5820	3843	5473	5038	3469	3209	4166	5897	5019
Mesh[T][S]	3571	3336	2823	4098	2635	2440	2243	3197	3757	2884
Mesh[T][S][FP]	3226	2571	2064	2504	2128	1874	1643	2388	3473	2277
Mesh[T][S]Sparse	2706	2903	2043	2270	2271	1433	1949	2798	2703	2493
Step[T]Alt	3237	2892	2085	3397	2715	1836	1645	3360	4529	2920
Step[T][S]	5555	5854	3695	5996	4655	3540	3094	2921	6269	3913
[T]Alt	3024	2821	3776	3956	4021	2189	2543	4259	6061	3652
[T][S]	3389	4938	2912	4452	2622	2443	2022	3297	3889	3004
[T][S][FP]	5827	4851	3530	4702	5471	3837	3252	6345	5192	4009
[T][S][HP]	3630	3049	2879	4100	3357	2510	2072	3824	5398	3302
[T][S][HP]Async	4235	4932	3626	5067	4098	3180	1650	3949	5243	3798
[T][S][L]	6379	4536	3709	7035	5020	3294	2769	5966	7131	5867
[T][S][L]Cache	5162	4764	3566	4223	5122	3038	2701	4351	5505	4070
[T][S]Sparse	3969	3788	3100	4142	3441	2886	2722	3159	3615	2967
sgd	4934	3061	3238	5226	3148	3252	3083	4103	6188	3486
step_sgd	4554	4305	2754	5064	4939	3206	2934	4730	6391	4485
step_tween	5670	4925	4087	4787	5690	3554	2816	5047	7069	4451
step_tween_chain	4682	4681	3657	5584	4913	3419	3188	5728	7377	4960
tween	5879	6685	4715	5528	5806	3856	3738	6033	7541	5512
tween_chain	6233	5092	4442	6090	5384	3571	3824	6298	7143	5886

Honesty - mean hard Acc, every mode x dtype (cols 1-12)

Honesty - mean hard Acc, every mode x dtype (cols 1-12)

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	25	25	27	25	26	25	26	25	23	25	25	23
Mesh[T]	24	26	29	27	25	24	26	25	23	28	28	23
Mesh[T]Alt	28	25	23	24	24	26	25	25	23	30	21	28
Mesh[T]Chain	25	27	26	26	25	25	23	25	25	24	26	28
Mesh[T][S]	27	24	20	21	26	25	27	24	25	24	26	26
Mesh[T][S][FP]	21	26	29	25	23	21	21	26	22	26	29	22
Mesh[T][S]Sparse	24	24	27	26	28	28	28	24	26	24	26	23
Step[T]Alt	27	27	25	25	23	25	24	25	25	27	24	25
Step[T][S]	26	23	27	24	25	26	25	25	26	25	25	26
[T]Alt	25	21	27	27	25	28	26	25	21	23	24	24
[T][S]	26	22	26	24	26	24	26	25	26	25	26	26
[T][S][FP]	29	26	25	28	25	26	24	24	27	24	22	28
[T][S][HP]	24	31	22	26	25	26	27	25	25	22	23	27
[T][S][HP]Async	27	25	24	25	24	28	21	24	26	25	21	23
[T][S][L]	26	25	25	23	28	23	27	26	28	26	21	25
[T][S][L]Cache	20	24	28	23	26	24	27	26	24	28	25	25
[T][S]Sparse	28	20	22	26	22	27	22	25	29	28	21	25
sgd	26	24	29	27	26	26	26	25	26	24	24	26
step_sgd	27	25	25	27	25	25	26	25	27	26	27	26
step_tween	23	23	26	26	26	27	26	25	28	27	23	26
step_tween_chain	27	24	25	26	26	26	25	25	25	25	28	25
tween	25	26	23	24	27	27	25	25	24	26	25	25
tween_chain	27	24	25	27	27	25	24	25	23	26	26	28

Honesty - mean hard Acc, every mode x dtype (cols 13-24)

Honesty - mean hard Acc, every mode x dtype (cols 13-24)

	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	23	25	26	27	23	23	24	27	24	27	26	24
Mesh[T]	25	23	23	27	26	24	26	24	24	26	25	24
Mesh[T]Alt	23	22	28	24	23	25	27	26	25	25	25	23
Mesh[T]Chain	26	23	27	26	25	24	26	25	25	26	24	24
Mesh[T][S]	24	20	25	18	24	27	23	20	23	28	23	21
Mesh[T][S][FP]	28	27	25	22	23	23	26	25	23	25	25	27
Mesh[T][S]Sparse	24	25	25	23	26	26	21	24	25	25	25	21
Step[T]Alt	26	27	24	26	24	22	25	26	25	27	27	25
Step[T][S]	25	22	26	26	25	25	24	27	25	27	27	26
[T]Alt	23	26	23	26	26	24	23	24	25	27	28	24
[T][S]	24	26	21	25	23	26	26	26	21	22	27	24
[T][S][FP]	24	23	27	29	30	24	21	25	26	22	22	20
[T][S][HP]	23	26	24	25	25	26	27	25	29	24	24	28
[T][S][HP]Async	29	24	27	28	22	34	23	25	30	23	24	31
[T][S][L]	23	31	22	22	24	25	24	27	25	25	22	28
[T][S][L]Cache	27	25	23	22	24	25	24	28	27	26	26	25
[T][S]Sparse	28	24	31	25	23	23	22	26	26	28	31	31
sgd	23	27	22	25	25	25	22	26	24	27	25	24
step_sgd	25	27	24	28	24	25	25	26	22	23	25	25
step_tween	26	22	25	23	25	25	24	24	26	26	24	24
step_tween_chain	25	25	24	27	26	24	25	26	25	26	26	26
tween	25	27	24	26	25	25	24	24	26	27	24	25
tween_chain	24	23	24	24	24	25	25	25	26	26	25	26

Honesty - mean hard Acc, every mode x dtype (cols 25-34)

Honesty - mean hard Acc, every mode x dtype (cols 25-34)

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	26	23	24	25	24	24	27	26	26	27
Mesh[T]	27	24	23	25	25	27	22	23	26	25
Mesh[T]Alt	20	31	27	27	26	23	25	24	27	26
Mesh[T]Chain	25	27	29	22	25	25	25	24	25	24
Mesh[T][S]	28	26	23	29	22	23	24	22	25	25
Mesh[T][S][FP]	29	25	26	24	21	25	23	22	24	23
Mesh[T][S]Sparse	23	25	25	25	24	21	27	29	25	28
Step[T]Alt	25	26	27	25	25	26	24	26	28	23
Step[T][S]	26	24	26	26	25	25	24	23	23	24
[T]Alt	23	23	29	25	24	24	23	27	27	27
[T][S]	24	29	24	24	23	24	23	23	26	24
[T][S][FP]	24	22	24	24	26	23	21	28	22	24
[T][S][HP]	26	26	25	27	23	25	23	26	26	24
[T][S][HP]Async	24	29	24	28	26	25	22	25	25	25
[T][S][L]	27	20	23	28	23	25	22	24	23	29
[T][S][L]Cache	28	25	25	23	29	22	25	23	24	22
[T][S]Sparse	27	27	24	26	23	27	24	27	22	18
sgd	26	22	24	27	23	26	24	26	25	24
step_sgd	25	24	24	26	26	23	24	25	25	26
step_tween	27	26	27	23	26	26	23	25	25	24
step_tween_chain	25	25	24	24	26	25	26	25	26	26
tween	25	28	25	24	25	27	25	24	24	23
tween_chain	25	25	25	25	26	26	27	25	24	26

Honesty - mean SoftAcc, every mode x dtype (cols 1-12)

Honesty - mean SoftAcc, every mode x dtype (cols 1-12)

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T]	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T]Alt	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T]Chain	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T][S]	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T][S][FP]	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T][S]Sparse	25	25	25	25	25	25	25	25	25	25	25	25
Step[T]Alt	25	25	25	25	25	25	25	25	25	25	25	25
Step[T][S]	25	25	25	25	25	25	25	25	25	25	25	25
[T]Alt	25	25	25	25	25	25	25	25	25	25	25	25
[T][S]	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][FP]	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][HP]	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][HP]Async	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][L]	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][L]Cache	25	25	25	25	25	25	25	25	25	25	25	25
[T][S]Sparse	25	25	25	25	25	25	25	25	25	25	25	25
sgd	25	24	25	25	25	24	25	25	25	24	25	24
step_sgd	25	25	25	25	25	25	25	25	25	25	25	25
step_tween	25	25	25	25	25	25	25	25	25	25	25	25
step_tween_chain	25	25	25	25	25	25	25	25	25	25	25	25
tween	25	25	25	25	25	25	25	25	25	25	25	25
tween_chain	25	25	25	25	25	25	25	25	25	25	25	25

Honesty - mean SoftAcc, every mode x dtype (cols 13-24)

Honesty - mean SoftAcc, every mode x dtype (cols 13-24)

	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T]	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T]Alt	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T]Chain	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T][S]	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T][S][FP]	25	25	25	25	25	25	25	25	25	25	25	25
Mesh[T][S]Sparse	25	25	25	25	25	25	25	25	25	25	25	25
Step[T]Alt	25	25	25	25	25	25	25	25	25	25	25	25
Step[T][S]	25	25	25	25	25	25	25	25	25	25	25	25
[T]Alt	25	25	25	25	25	25	25	25	25	25	25	25
[T][S]	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][FP]	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][HP]	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][HP]Async	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][L]	25	25	25	25	25	25	25	25	25	25	25	25
[T][S][L]Cache	25	25	25	25	25	25	25	25	25	25	25	25
[T][S]Sparse	25	25	25	25	25	25	25	25	25	25	25	25
sgd	24	25	25	25	25	25	25	25	24	25	24	25
step_sgd	25	25	25	25	25	25	25	25	25	25	25	25
step_tween	25	25	25	25	25	25	25	25	25	25	25	25
step_tween_chain	25	25	25	25	25	25	25	25	25	25	25	25
tween	25	25	25	25	25	25	25	25	25	25	25	25
tween_chain	25	25	25	25	25	25	25	25	25	25	25	25

Honesty - mean SoftAcc, every mode x dtype (cols 25-34)

Honesty - mean SoftAcc, every mode x dtype (cols 25-34)

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	25	25	25	25	25	25	25	25	25	25
Mesh[T]	25	25	25	25	25	25	25	25	25	25
Mesh[T]Alt	25	25	25	25	25	25	25	25	25	25
Mesh[T]Chain	25	25	25	25	25	25	25	25	25	25
Mesh[T][S]	25	25	25	25	25	25	25	25	25	25
Mesh[T][S][FP]	25	25	25	25	25	25	25	25	25	25
Mesh[T][S]Sparse	25	25	25	25	25	25	25	25	25	25
Step[T]Alt	25	25	25	25	25	25	25	25	25	25
Step[T][S]	25	25	25	25	25	25	25	25	25	25
[T]Alt	25	25	25	25	25	25	25	25	25	25
[T][S]	25	25	25	25	25	25	25	25	25	25
[T][S][FP]	25	25	25	25	25	25	25	25	25	25
[T][S][HP]	25	25	25	25	25	25	25	25	25	25
[T][S][HP]Async	25	25	25	25	25	25	25	25	25	25
[T][S][L]	25	25	25	25	25	25	25	25	25	25
[T][S][L]Cache	25	25	25	25	25	25	25	25	25	25
[T][S]Sparse	25	25	25	25	25	25	25	25	25	25
sgd	25	25	25	25	24	25	25	25	25	25
step_sgd	25	25	25	25	25	25	25	25	25	25
step_tween	25	25	25	25	25	25	25	25	25	25
step_tween_chain	25	25	25	25	25	25	25	25	25	25
tween	25	25	25	25	25	25	25	25	25	25
tween_chain	25	25	25	25	25	25	25	25	25	25

Honesty - mean Avail, every mode x dtype (cols 1-12)

Honesty - mean Avail, every mode x dtype (cols 1-12)

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	50	48	49	49	48	49	50	48	45	49	48	48
Mesh[T]	50	49	47	47	49	50	50	48	44	48	49	47
Mesh[T]Alt	42	43	41	40	40	45	44	40	37	41	41	42
Mesh[T]Chain	47	44	44	44	47	46	49	42	40	47	47	43
Mesh[T][S]	54	53	55	56	54	53	52	52	53	54	54	55
Mesh[T][S][FP]	53	53	55	56	54	53	54	53	53	55	54	55
Mesh[T][S]Sparse	55	53	56	56	55	54	56	55	55	57	56	56
Step[T]Alt	38	39	38	39	40	42	41	37	33	39	38	40
Step[T][S]	49	51	49	50	46	49	49	51	46	49	50	49
[T]Alt	42	43	40	41	41	46	45	40	36	41	42	41
[T][S]	46	46	47	47	44	46	47	39	46	46	45	46
[T][S][FP]	54	53	52	56	54	53	53	52	53	55	53	55
[T][S][HP]	54	53	55	55	54	53	54	53	53	51	53	55
[T][S][HP]Async	53	54	56	56	54	53	54	53	53	54	54	55
[T][S][L]	51	50	53	52	52	51	52	52	48	51	52	52
[T][S][L]Cache	53	54	55	55	54	53	54	53	54	54	53	55
[T][S]Sparse	55	54	56	57	57	56	55	55	55	56	56	57
sgd	40	41	41	41	40	41	42	40	40	40	41	41
step_sgd	42	43	40	40	41	44	43	42	39	42	42	39
step_tween	46	45	42	41	45	48	47	45	40	45	44	41
step_tween_chain	45	47	43	43	45	48	47	45	41	46	45	42
tween	48	49	48	48	48	49	49	47	44	49	48	47
tween_chain	49	49	49	49	49	48	50	48	45	49	48	48

Honesty - mean Avail, every mode x dtype (cols 13-24)

Honesty - mean Avail, every mode x dtype (cols 13-24)

	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	49	49	44	49	48	45	45	49	50	47	48	48
Mesh[T]	48	50	45	49	49	44	43	47	50	45	49	47
Mesh[T]Alt	40	43	40	41	43	39	37	40	43	39	43	41
Mesh[T]Chain	47	43	42	46	44	43	41	46	47	41	42	43
Mesh[T][S]	54	53	55	55	53	54	54	54	53	54	51	56
Mesh[T][S][FP]	55	54	54	55	53	53	53	55	53	53	53	56
Mesh[T][S]Sparse	56	55	57	56	55	55	54	56	55	57	53	57
Step[T]Alt	39	40	35	38	39	34	32	39	42	37	39	38
Step[T][S]	46	51	46	48	51	46	46	46	48	48	51	49
[T]Alt	41	43	41	40	43	39	37	40	45	40	43	39
[T][S]	48	45	48	49	45	48	47	47	45	44	45	47
[T][S][FP]	55	52	55	56	53	54	52	52	53	54	54	55
[T][S][HP]	55	53	54	55	52	53	53	54	53	54	54	56
[T][S][HP]Async	55	53	55	53	50	53	52	55	53	54	53	56
[T][S][L]	52	51	51	51	50	49	47	51	51	51	51	52
[T][S][L]Cache	55	54	55	55	53	53	53	55	53	54	53	56
[T][S]Sparse	57	56	54	57	54	56	56	56	55	56	54	57
sgd	35	39	42	41	41	41	40	41	37	41	39	43
step_sgd	41	43	39	41	43	41	39	41	42	39	43	39
step_tween	43	47	41	44	46	41	39	42	47	41	47	42
step_tween_chain	45	47	40	44	46	41	41	44	48	41	48	42
tween	48	49	44	47	47	44	45	48	49	46	49	47
tween_chain	49	48	46	49	49	46	44	49	49	47	48	48

Honesty - mean Avail, every mode x dtype (cols 25-34)

Honesty - mean Avail, every mode x dtype (cols 25-34)

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	49	48	45	50	48	45	45	49	50	48
Mesh[T]	48	47	45	49	48	45	46	47	49	47
Mesh[T]Alt	41	40	40	40	41	39	37	40	44	41
Mesh[T]Chain	45	44	41	43	45	43	41	45	44	45
Mesh[T][S]	55	55	55	55	55	55	54	55	53	53
Mesh[T][S][FP]	54	55	54	54	55	54	53	55	53	55
Mesh[T][S]Sparse	56	57	58	55	56	57	56	56	53	57
Step[T]Alt	39	37	36	39	38	34	33	39	42	38
Step[T][S]	50	50	47	50	49	46	45	46	51	48
[T]Alt	40	40	40	41	40	39	38	41	44	41
[T][S]	45	47	48	48	46	48	47	46	46	48
[T][S][FP]	56	55	56	55	55	54	53	55	53	55
[T][S][HP]	54	55	54	55	54	55	53	55	52	56
[T][S][HP]Async	55	55	55	55	55	54	52	55	53	56
[T][S][L]	53	52	52	53	52	49	48	52	52	52
[T][S][L]Cache	56	55	55	55	54	54	54	55	51	56
[T][S]Sparse	56	57	58	56	56	56	55	54	54	57
sgd	42	40	41	44	40	41	41	43	42	42
step_sgd	41	41	39	41	41	42	41	40	43	40
step_tween	43	43	41	43	43	42	40	43	47	42
step_tween_chain	43	43	41	45	43	43	41	44	47	43
tween	45	48	45	48	48	45	44	48	50	48
tween_chain	50	49	46	49	49	46	45	49	50	48

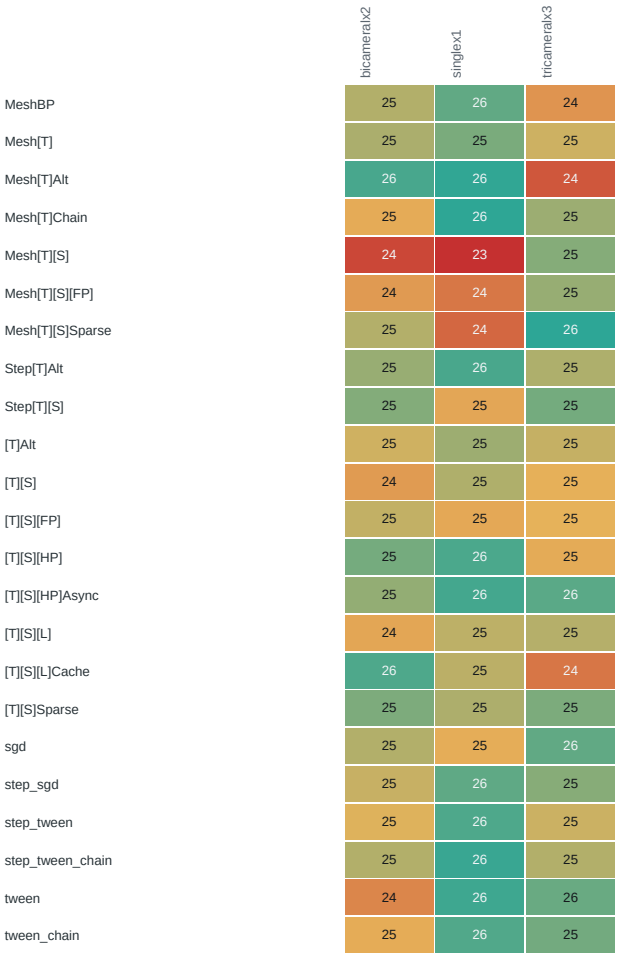
Mean Score, every mode x arch

Mean Score, every mode x arch

	bicameralx2	singlex1	tricameralx3
MeshBP	2516	11986	1593
Mesh[T]	2311	12268	1508
Mesh[T]Alt	831	5831	451
Mesh[T]Chain	1745	12152	927
Mesh[T][S]	1732	6314	1408
Mesh[T][S][FP]	1451	5459	1111
Mesh[T][S]Sparse	1504	4936	1195
Step[T]Alt	870	7612	545
Step[T][S]	2513	10267	1789
[T]Alt	1309	9643	758
[T][S]	1979	6861	1659
[T][S][FP]	2819	10670	2094
[T][S][HP]	2007	7642	1582
[T][S][HP]Async	2268	8794	1687
[T][S][L]	2780	12178	1933
[T][S][L]Cache	2638	9556	1811
[T][S]Sparse	2245	7569	1701
sgd	2338	7882	1822
step_sgd	2157	10762	1467
step_tween	2032	12414	1311
step_tween_chain	2062	12617	1339
tween	2563	13233	1979
tween_chain	2665	13133	1948

Mean hard Acc, every mode x arch

Mean hard Acc, every mode x arch

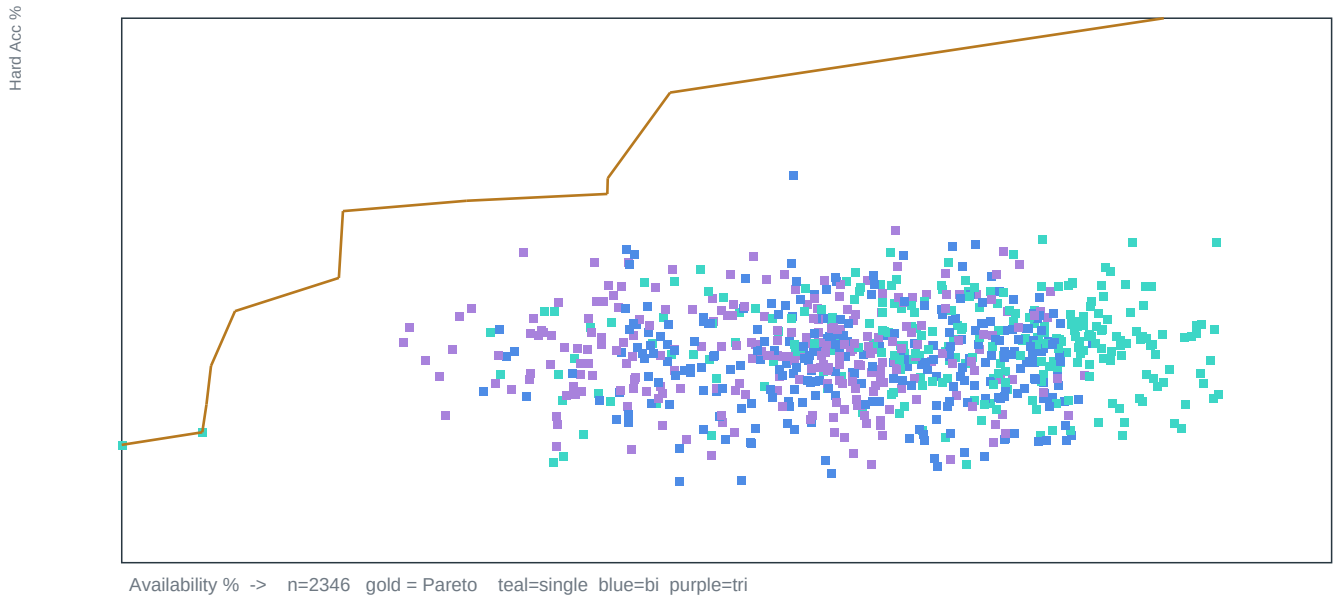


Mean Avail, every mode x arch

Mean Avail, every mode x arch

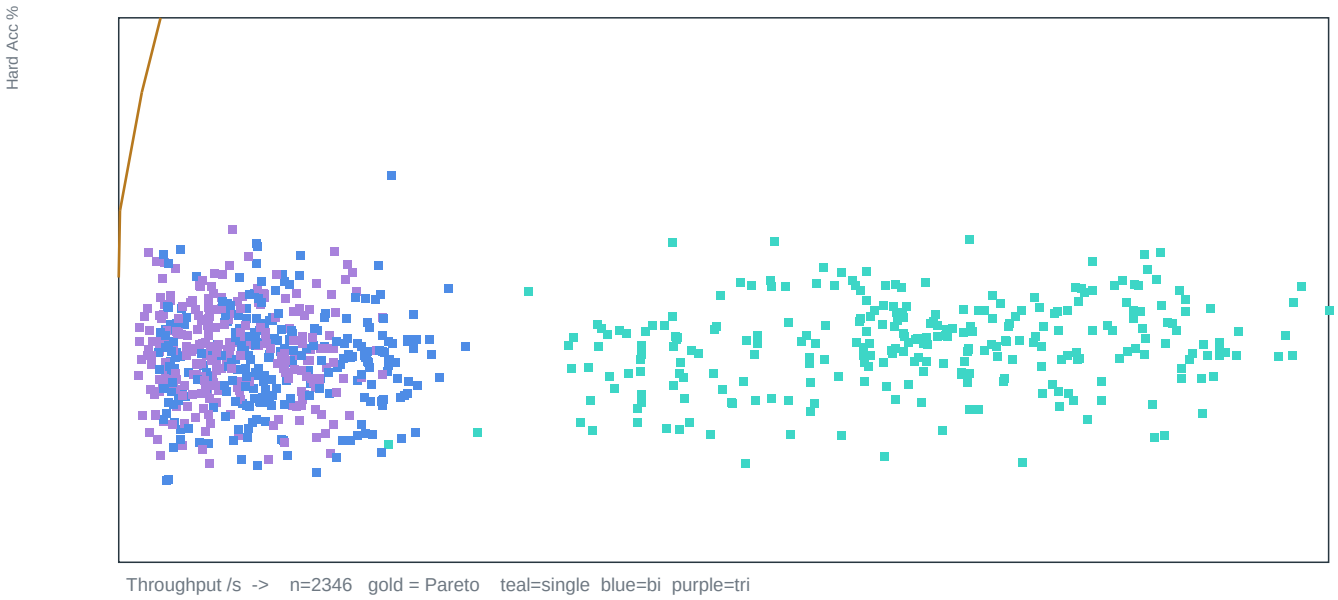
	bicamerarx2	singlex1	tricamerarx3
MeshBP	47	51	45
Mesh[T]	47	51	44
Mesh[T]Alt	38	50	34
Mesh[T]Chain	43	51	38
Mesh[T][S]	56	51	55
Mesh[T][S][FP]	56	52	54
Mesh[T][S]Sparse	58	52	57
Step[T]Alt	34	48	32
Step[T][S]	49	49	47
[T]Alt	39	50	34
[T][S]	48	44	47
[T][S][FP]	56	52	54
[T][S][HP]	56	51	54
[T][S][HP]Async	56	52	54
[T][S][L]	52	52	49
[T][S][L]Cache	56	51	55
[T][S]Sparse	58	52	57
sgd	42	38	42
step_sgd	42	43	39
step_tween	42	50	38
step_tween_chain	43	51	38
tween	47	50	45
tween_chain	48	51	45

Pillars - Availability vs hard Acc

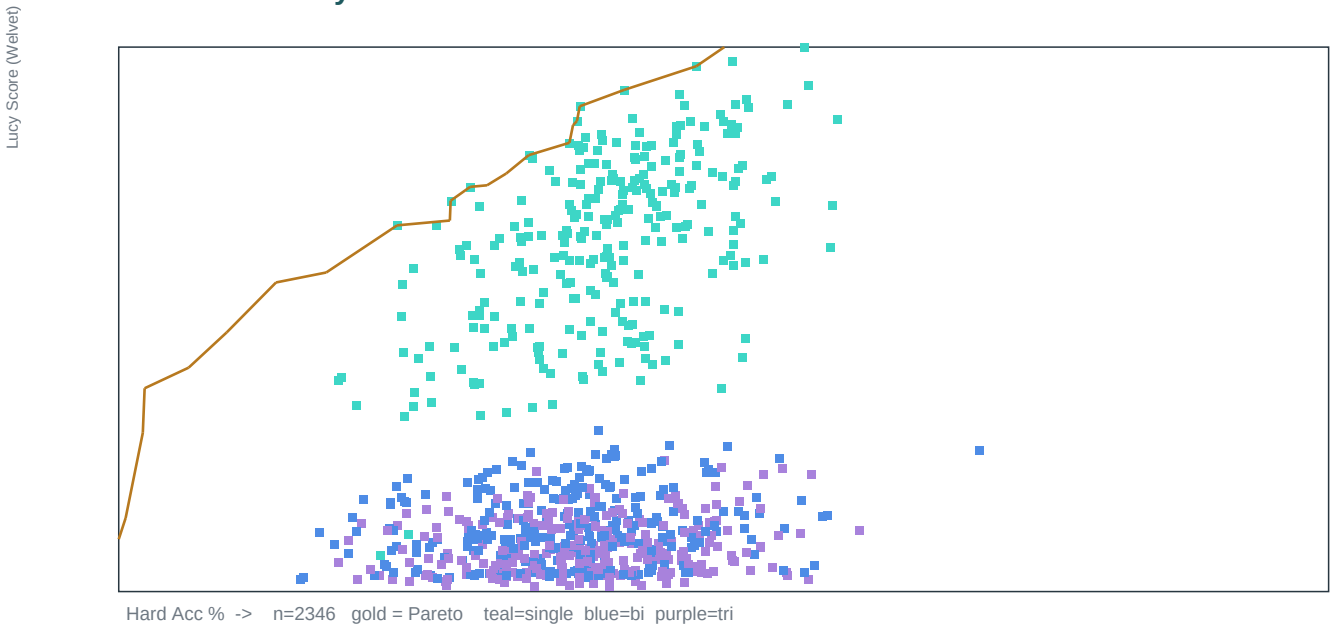


Pillars - Throughput vs hard Acc

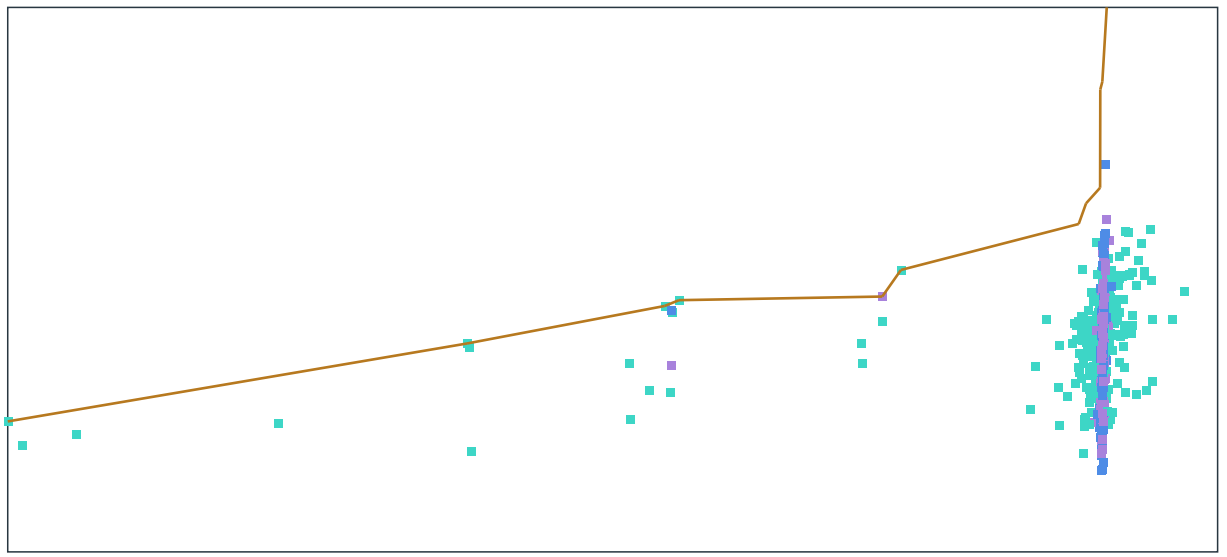
Pillars - Throughput vs hard Acc



Pareto - hard Acc vs Lucy Score

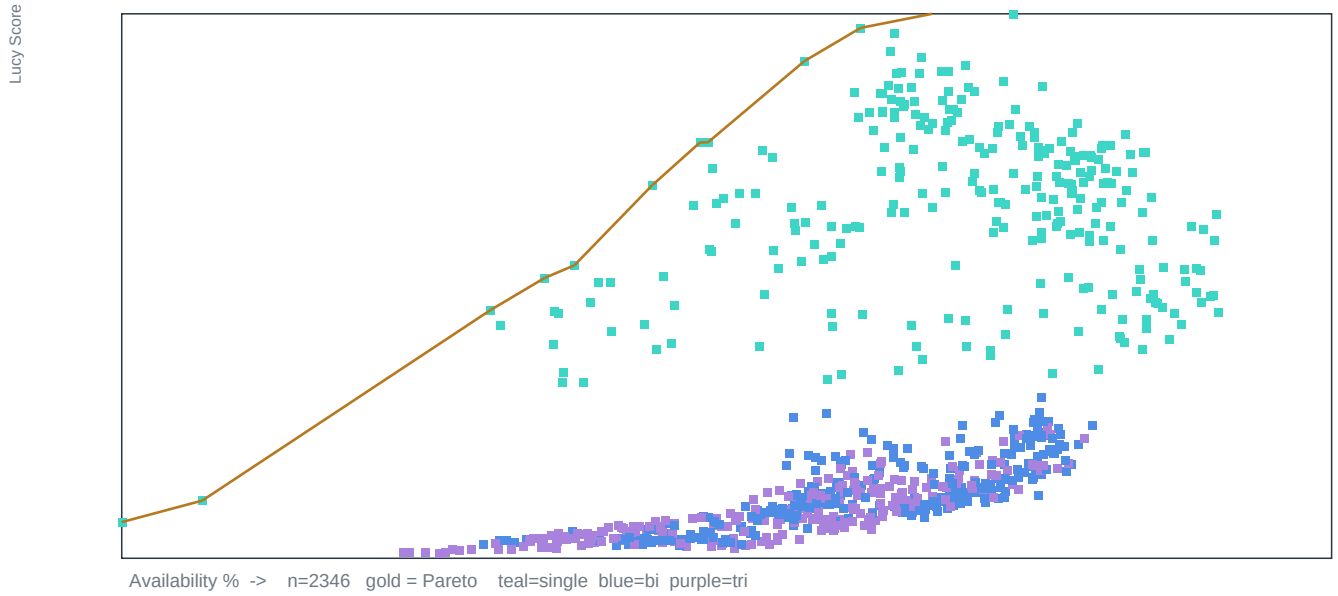


SoftAcc (serve-confidence) vs hard Acc

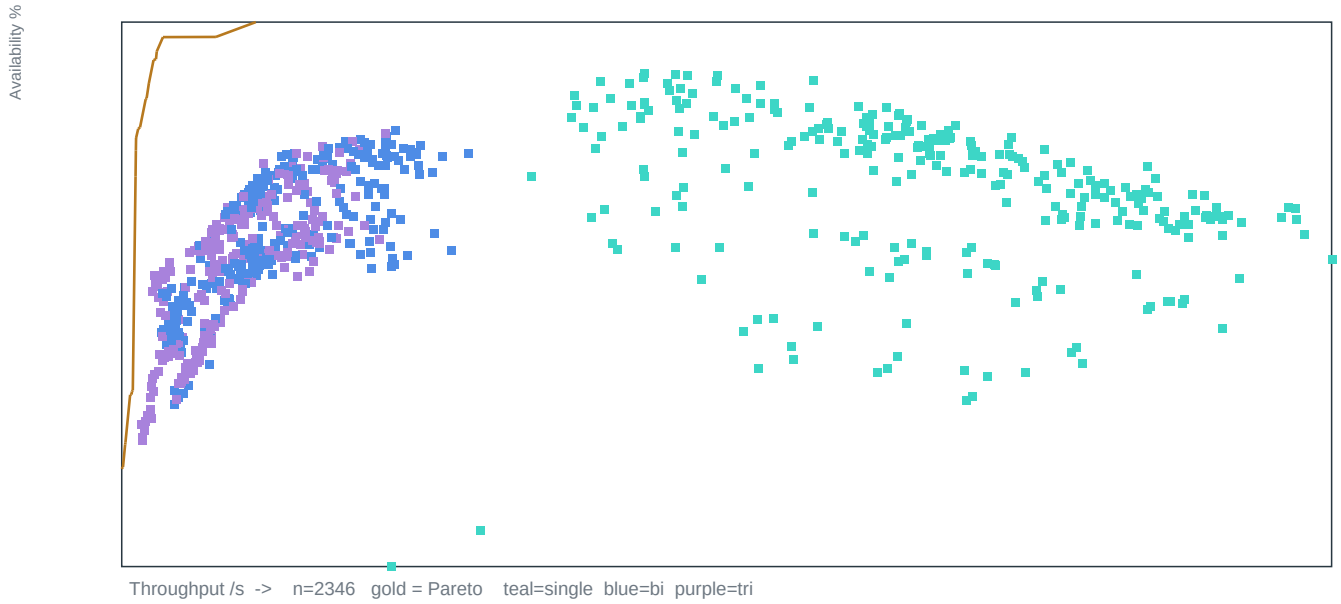



SoftAcc % -> n=2346 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

Avail vs Lucy Score (duty clock)



Pillars - Throughput vs Availability



AdaptPct vs hard Acc



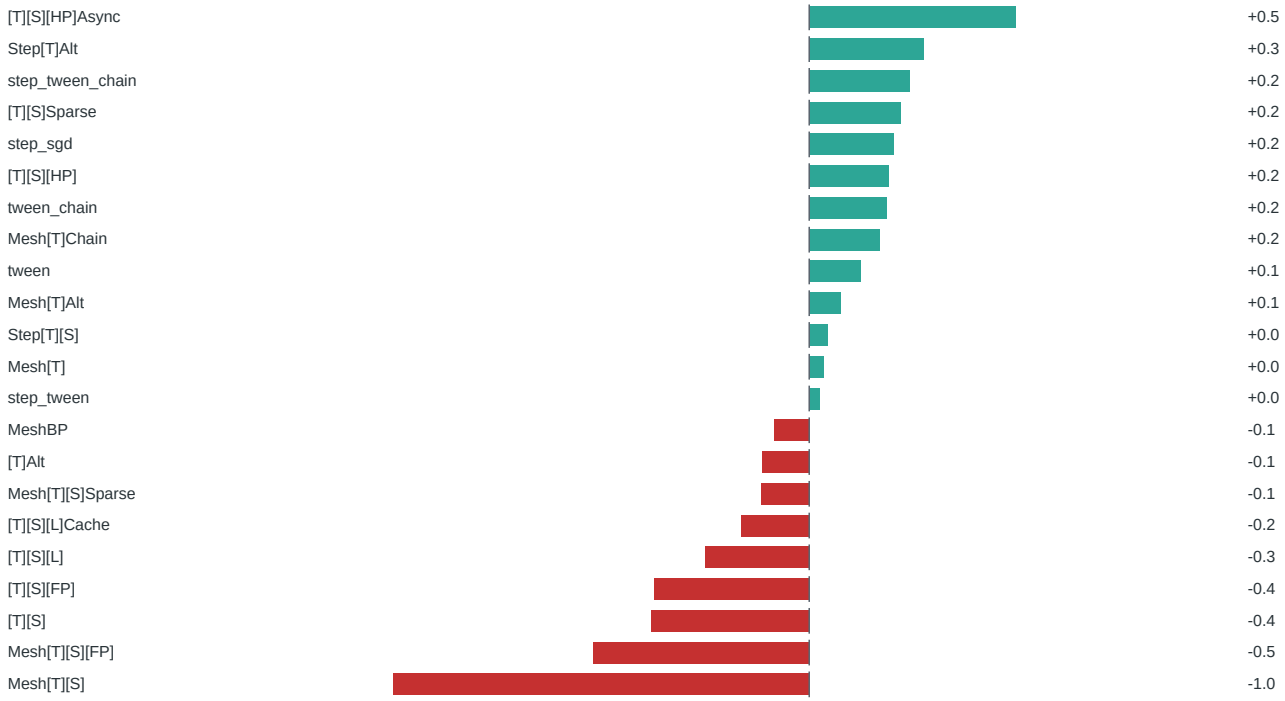

AdaptPct % -> n=2346 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

vs sgd - matched dtype x format x arch

AccDelta is the honest column. ScoreDelta is usually Availability (duty clock), not a better chain rule. Acc win = AccDelta > 0.5. Score win = ScoreDelta > 1. Baseline is discovered from the board, not a frozen StepBP list.

mode	n	AccD	Acc win%	SoftD	AvailD	ThruD	ScoreD	Score win%
[T][S][HP]Async	102	+0.5	50	+0.3	+13.2	-9089	+235.5	49
Step[T]Alt	102	+0.3	47	+0.3	-2.8	-14950	-1005.2	16
step_tween_chain	102	+0.2	51	+0.3	+3.3	+1773	+1325.1	40
[T][S]Sparse	102	+0.2	49	+0.3	+15.0	-11941	-175.8	37
step_sgd	102	+0.2	48	+0.2	+0.4	+3599	+780.9	38
[T][S][HP]	102	+0.2	49	+0.3	+13.2	-12708	-270.7	24
tween_chain	102	+0.2	45	+0.3	+7.3	+6102	+1901.1	81
Mesh[T]Chain	102	+0.2	43	+0.3	+3.3	-1470	+927.0	41
tween	102	+0.1	47	+0.3	+6.5	+6520	+1911.0	76
Mesh[T]Alt	102	+0.1	48	+0.3	+0.1	-21002	-1643.5	5
Step[T][S]	102	+0.0	41	+0.3	+7.6	-675	+842.0	62
Mesh[T]	102	+0.0	43	+0.3	+6.7	+1684	+1348.3	47
step_tween	102	+0.0	41	+0.3	+2.6	+2179	+1238.2	38
MeshBP	102	-0.1	47	+0.3	+7.1	+1655	+1350.8	58
[T]Alt	102	-0.1	41	+0.3	+0.3	-8012	-110.8	24
Mesh[T][S]Sparse	102	-0.1	45	+0.3	+14.8	-21165	-1469.1	5
[T][S][L]Cache	102	-0.2	45	+0.3	+13.2	-4863	+654.2	63
[T][S][L]	102	-0.3	44	+0.3	+10.3	+3444	+1616.5	78
[T][S][FP]	102	-0.4	47	+0.3	+13.2	-474	+1180.5	81
[T][S]	102	-0.4	41	+0.3	+5.5	-9398	-514.2	28
Mesh[T][S][FP]	102	-0.5	38	+0.3	+13.2	-19662	-1340.5	4
Mesh[T][S]	102	-1.0	36	+0.3	+13.2	-14879	-862.6	13

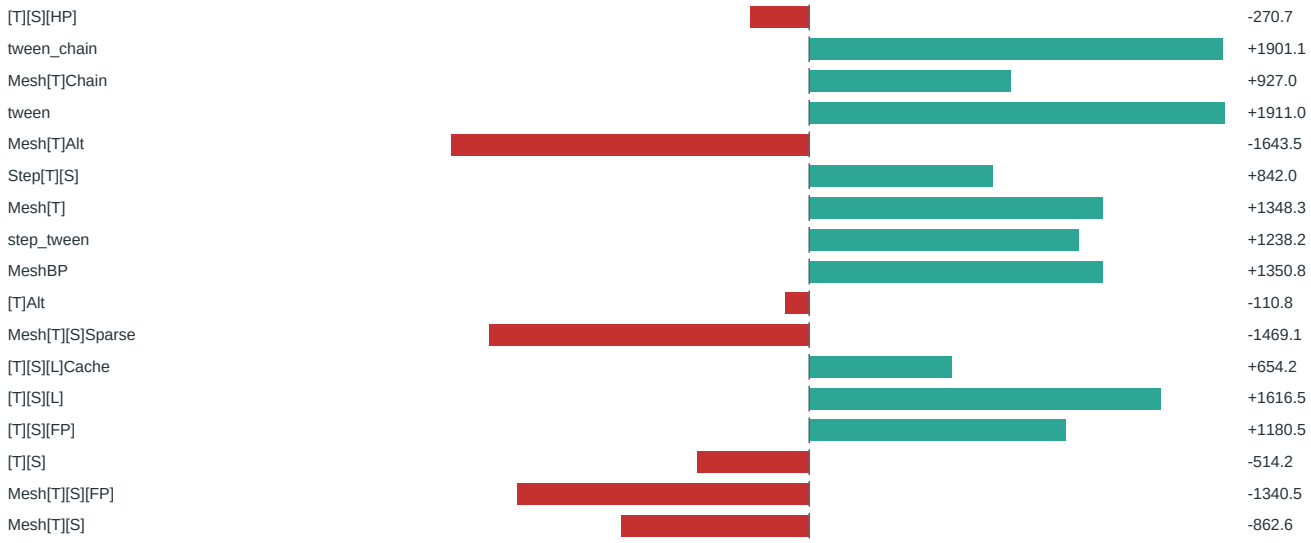
mean AccD vs sgd



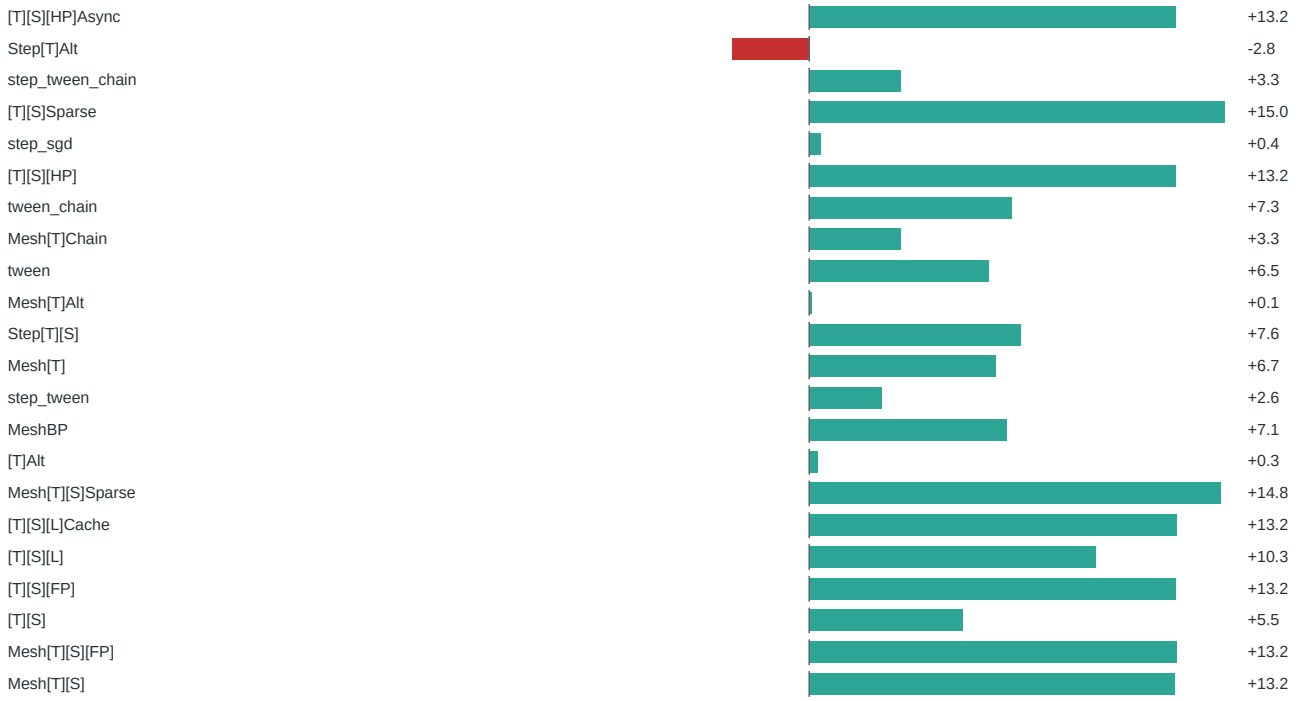
mean ScoreD vs sgd (duty clock)



mean ScoreD vs sgd (duty clock)



mean AvailD vs sgd



AccD vs sgd, every mode x dtype (cols 1-12)

AccD vs sgd, every mode x dtype (cols 1-12)

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	-1	+1	-2	-2	-1	-1	-0	+0	-3	+1	+1	-3
Mesh[T]	-2	+2	+0	+0	-2	-2	-1	+0	-3	+4	+4	-3
Mesh[T]Alt	+1	+2	-6	-3	-3	+0	-1	+1	-3	+6	-3	+2
Mesh[T]Chain	-1	+3	-2	-1	-1	-1	-3	+0	-1	-0	+2	+2
Mesh[T][S]	+1	-0	-8	-5	-0	-1	+1	-0	-1	-0	+2	-0
Mesh[T][S][FP]	-5	+2	+0	-1	-4	-6	-6	+1	-3	+2	+5	-4
Mesh[T][S]Sparse	-2	+1	-2	-1	+1	+2	+1	-0	-0	-0	+2	-3
Step[T]Alt	+1	+3	-3	-1	-3	-1	-2	+0	-1	+3	-0	-1
Step[T][S]	+0	-1	-2	-3	-1	-0	-1	+1	-0	+2	+1	-0
[T]Alt	-1	-3	-1	+1	-1	+2	-0	-0	-5	-1	-0	-2
[T][S]	-0	-2	-3	-3	-1	-2	-1	+1	-0	+1	+2	+0
[T][S][FP]	+3	+2	-3	+2	-1	-1	-3	-0	+1	-0	-2	+2
[T][S][HP]	-2	+8	-7	-0	-2	-0	+1	+1	-1	-2	-1	+1
[T][S][HP]Async	+1	+2	-5	-2	-2	+2	-6	-1	+0	+1	-3	-3
[T][S][L]	-0	+1	-3	-3	+1	-3	+1	+1	+2	+2	-3	-1
[T][S][L]Cache	-6	+0	-1	-4	-1	-2	+1	+1	-2	+4	+1	-1
[T][S]Sparse	+2	-4	-6	-1	-4	+1	-4	+1	+3	+4	-3	-1
step_sgd	+1	+1	-3	+0	-1	-1	-0	+0	+1	+2	+3	+0
step_tween	-3	-1	-3	-1	-0	+1	-0	+0	+2	+3	-1	-0
step_tween_chain	+1	+0	-4	-0	-0	-0	-1	+0	-1	+1	+4	-1
tween	-1	+3	-5	-2	+1	+1	-2	+0	-2	+2	+1	-1
tween_chain	+1	+0	-4	+0	+0	-1	-2	+0	-2	+2	+2	+2

AccD vs sgd, every mode x dtype (cols 13-24)

AccD vs sgd, every mode x dtype (cols 13-24)

	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	+0	-3	+3	+2	-2	-3	+2	+1	-0	+0	+1	+0
Mesh[T]	+2	-4	+1	+2	+1	-1	+4	-2	+0	-1	-0	+0
Mesh[T]Alt	-1	-5	+5	-1	-2	-0	+5	-0	+1	-2	-0	-1
Mesh[T]Chain	+3	-4	+4	+1	+1	-2	+4	-0	+1	-1	-1	-0
Mesh[T][S]	+0	-8	+2	-7	-0	+2	+1	-5	-1	+1	-2	-4
Mesh[T][S][FP]	+5	-1	+3	-3	-2	-2	+4	-1	-1	-2	-0	+3
Mesh[T][S]Sparse	+0	-3	+2	-2	+1	+0	-1	-2	+1	-2	+0	-3
Step[T]Alt	+2	-0	+2	+1	-1	-3	+3	+1	+1	+0	+2	+0
Step[T][S]	+2	-5	+4	+1	+1	-0	+3	+1	+0	+0	+2	+2
[T]Alt	-0	-1	+0	+1	+1	-1	+2	-2	+1	-0	+3	-0
[T][S]	+1	-1	-1	-0	-1	+1	+4	+0	-3	-5	+2	-0
[T][S][FP]	+1	-5	+5	+4	+5	-1	-1	-1	+2	-4	-3	-5
[T][S][HP]	-0	-1	+2	-0	+0	+1	+5	-1	+5	-3	-1	+4
[T][S][HP]Async	+6	-4	+5	+3	-2	+9	+1	-1	+5	-3	-1	+7
[T][S][L]	-0	+3	+0	-3	-1	-1	+2	+1	+1	-2	-3	+4
[T][S][L]Cache	+3	-3	+1	-3	-1	-0	+2	+2	+3	-1	+1	+1
[T][S]Sparse	+5	-4	+9	-0	-2	-2	+0	+0	+2	+1	+6	+6
step_sgd	+1	-1	+2	+3	-1	-1	+3	-0	-2	-4	-0	+1
step_tween	+2	-5	+2	-2	+0	+0	+2	-2	+2	-0	-1	-0
step_tween_chain	+1	-2	+1	+2	+1	-2	+3	-0	+0	-1	+1	+1
tween	+2	-0	+2	+1	+0	-1	+2	-2	+1	+1	-1	+1
tween_chain	+1	-4	+1	-1	-0	-1	+3	-1	+1	-0	+0	+1

AccD vs sgd, every mode x dtype (cols 25-34)

AccD vs sgd, every mode x dtype (cols 25-34)

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	+0	+1	-0	-2	+1	-2	+3	+0	+1	+2
Mesh[T]	+1	+2	-1	-2	+2	+1	-2	-3	+1	+1
Mesh[T]Alt	-6	+9	+3	-0	+3	-4	+1	-2	+2	+2
Mesh[T]Chain	-1	+4	+5	-4	+2	-1	+1	-2	+0	-0
Mesh[T][S]	+2	+4	-1	+3	-1	-3	-0	-4	+0	+0
Mesh[T][S][FP]	+3	+3	+2	-2	-2	-1	-0	-4	-1	-1
Mesh[T][S]Sparse	-3	+3	+1	-2	+1	-6	+3	+3	+0	+4
Step[T]Alt	-1	+4	+2	-2	+2	+0	+0	-0	+3	-1
Step[T][S]	-1	+1	+2	-1	+2	-1	+0	-3	-2	-1
[T]Alt	-3	+1	+5	-2	+1	-2	-1	+1	+2	+3
[T][S]	-2	+6	+0	-3	-0	-2	-1	-3	+1	-1
[T][S][FP]	-2	+0	+0	-3	+3	-3	-3	+2	-3	-1
[T][S][HP]	+0	+3	+1	+0	-0	-2	-1	-0	+2	-0
[T][S][HP]Async	-2	+7	+0	+1	+3	-1	-2	-1	+0	+0
[T][S][L]	+1	-2	-1	+1	-0	-1	-2	-2	-2	+5
[T][S][L]Cache	+2	+3	+1	-4	+6	-4	+1	-3	-0	-3
[T][S]Sparse	+1	+5	-0	-1	+0	+1	+0	+1	-3	-6
step_sgd	-1	+2	-0	-1	+3	-3	+0	-1	+1	+2
step_tween	+1	+4	+2	-4	+3	-0	-1	-1	+0	+0
step_tween_chain	-1	+2	-0	-2	+3	-1	+2	-1	+1	+2
tween	-1	+5	+1	-3	+2	+1	+2	-2	-0	-1
tween_chain	-1	+2	+1	-2	+3	-0	+3	-1	-1	+2

ScoreD vs sgd, every mode x dtype (cols 1-12)

ScoreD vs sgd, every mode x dtype (cols 1-12)

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	+2429	+1479	+1275	+1123	+1914	+1602	+1521	+1929	+313	+2176	+1352	+744
Mesh[T]	+1626	+2945	+589	+1407	+2072	+486	+576	+2248	+176	+2678	+2839	+961
Mesh[T]Alt	-1900	-1639	-1948	-1793	-2045	-2323	-2160	-1725	-1198	-658	-2172	-1175
Mesh[T]Chain	+901	+2160	+1213	+879	+918	+549	+273	+1444	+346	+1012	+580	+891
Mesh[T][S]	-889	-1172	-1460	-607	-544	-1528	-1626	-375	-503	-244	-658	-735
Mesh[T][S][FP]	-1900	-1511	-1584	-1160	-1502	-2787	-2575	-974	-1398	-671	-874	-1281
Mesh[T][S]Sparse	-1947	-1893	-1531	-1478	-1050	-1928	-2011	-1337	-1203	-1053	-1296	-1637
Step[T]Alt	-930	-269	-1338	-835	-1274	-2387	-1241	-995	-898	+245	-1821	-950
Step[T][S]	-34	+2187	+1195	+1152	-148	+625	-320	+2721	+494	+1207	+1124	+1194
[T]Alt	-240	-806	-506	+155	+378	+741	+161	+315	-741	+296	+378	-396
[T][S]	-844	-673	-226	-406	-843	-989	-1385	-1115	-747	-159	-939	-472
[T][S][FP]	+2818	+2052	-149	+1434	+1416	+1637	-121	+1751	+828	+1756	+872	+1865
[T][S][HP]	-864	+1616	-499	-193	-164	-900	-402	-82	-278	+90	-525	-151
[T][S][HP]Async	+855	+870	-269	-103	+5	+507	-800	+603	-243	+913	-660	+93
[T][S][L]	+2435	+1655	+1777	+1073	+2045	+2446	+2247	+2717	+1716	+3229	+873	+1594
[T][S][L]Cache	-405	+173	-307	-255	+712	+758	+1201	+1509	-40	+2228	+1715	+670
[T][S]Sparse	+342	-1146	-757	-398	-78	+83	-1508	+471	+22	+892	-861	-46
step_sgd	+1450	+1408	+436	+803	+1015	+1963	+688	+1779	+279	+1514	+1377	+931
step_tween	+1310	+838	+819	+1353	+1782	+2383	+726	+2238	+640	+3004	+933	+1241
step_tween_chain	+1986	+1739	+261	+1311	+1777	+2435	+1339	+2072	+274	+2201	+1852	+776
tween	+2296	+2925	+1247	+1755	+2674	+3133	+1625	+2866	+767	+2597	+1892	+1747
tween_chain	+2882	+2633	+1588	+2206	+2725	+1320	+1721	+3058	+624	+3095	+2474	+2069

ScoreD vs sgd, every mode x dtype (cols 13-24)

ScoreD vs sgd, every mode x dtype (cols 13-24)

	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	+3178	+1224	+576	+1719	+713	-186	+861	+2122	+3704	+1169	+2528	+671
Mesh[T]	+3752	+1370	+426	+1843	+1967	-671	+207	+952	+4176	-390	+2179	+755
Mesh[T]Alt	+405	-2298	-1516	-1217	-2342	-1624	-1155	-1406	-160	-2652	-2214	-1958
Mesh[T]Chain	+3852	-333	+1114	+605	+974	-252	+609	+547	+3310	+139	+1058	+944
Mesh[T][S]	+1105	-1943	-587	-1358	-1445	-889	-720	-1292	+942	-1199	-1406	-1464
Mesh[T][S][FP]	+1724	-1491	-1275	-1178	-2539	-1623	-679	-1256	+655	-1849	-1225	-1056
Mesh[T][S]Sparse	+834	-1825	-1001	-1631	-2062	-1741	-1236	-1278	+113	-1861	-1656	-2092
Step[T]Alt	+1405	-766	-1266	-646	-1979	-1781	-1041	-844	+860	-2230	-475	-1614
Step[T][S]	+1803	+583	+1139	+596	+1840	-47	+219	-583	+1720	+1046	+2638	+503
[T]Alt	+1850	+494	-964	+70	-694	-985	-373	-351	+1832	-1254	+1067	-776
[T][S]	+1215	-918	+80	-872	-414	-384	+577	-340	+775	-1418	+177	-413
[T][S][FP]	+4008	+830	+666	+2392	+2433	+206	+454	+489	+4616	-302	+660	+229
[T][S][HP]	+1792	-698	-289	-253	-705	-699	-130	-538	+2532	-1350	-346	-571
[T][S][HP]Async	+3187	+604	+308	+6	-573	+557	-257	-205	+2760	-1274	-58	+1121
[T][S][L]	+2652	+3157	+644	+983	+1767	+113	+991	+2113	+4286	-493	+1855	+1103
[T][S][L]Cache	+2735	+1033	+578	+179	+844	-401	+402	+1643	+3662	-78	+716	+187
[T][S]Sparse	+2664	-487	-245	-194	-645	-1340	-411	+33	+2242	-314	+1494	+140
step_sgd	+2720	+1248	+251	+1034	+174	-432	+48	+937	+2111	-873	+1926	+121
step_tween	+3481	+1477	+491	+1617	+2087	+67	+370	+285	+4444	+255	+1637	+243
step_tween_chain	+3446	+2161	+89	+1887	+1741	-773	+406	+1484	+4283	-109	+3267	+677
tween	+3823	+3083	+590	+1952	+2002	+29	+457	+1467	+4958	+1363	+2781	+1373
tween_chain	+3694	+1578	+1346	+2002	+2315	+212	+979	+2067	+4812	+735	+2677	+1582

ScoreD vs sgd, every mode x dtype (cols 25-34)

ScoreD vs sgd, every mode x dtype (cols 25-34)

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	+754	+1164	+607	+404	+1827	+741	+262	+1871	+550	+1613
Mesh[T]	+843	+1577	+376	+891	+2346	+1068	+42	+928	+967	+1636
Mesh[T]Alt	-3024	-287	-1524	-2724	-221	-1802	-1891	-1624	-2622	-1288
Mesh[T]Chain	+635	+2759	+605	+247	+1890	+216	+126	+63	-291	+1533
Mesh[T][S]	-1363	+275	-414	-1128	-513	-813	-841	-906	-2431	-602
Mesh[T][S][FP]	-1707	-490	-1173	-2722	-1020	-1379	-1441	-1715	-2715	-1209
Mesh[T][S]Sparse	-2228	-158	-1195	-2956	-877	-1819	-1134	-1305	-3485	-993
Step[T]Alt	-1697	-169	-1153	-1829	-433	-1416	-1438	-744	-1659	-566
Step[T][S]	+621	+2793	+458	+770	+1507	+287	+11	-1182	+81	+427
[T]Alt	-1910	-240	+538	-1270	+873	-1064	-540	+156	-127	+166
[T][S]	-1544	+1877	-325	-774	-526	-809	-1061	-806	-2299	-482
[T][S][FP]	+893	+1790	+292	-524	+2323	+585	+168	+2242	-996	+523
[T][S][HP]	-1304	-12	-359	-1126	+209	-743	-1011	-279	-790	-184
[T][S][HP]Async	-699	+1871	+388	-159	+950	-73	-1433	-154	-945	+312
[T][S][L]	+1445	+1475	+471	+1809	+1872	+42	-314	+1863	+943	+2381
[T][S][L]Cache	+228	+1703	+328	-1003	+1974	-214	-383	+247	-683	+584
[T][S]Sparse	-965	+727	-137	-1084	+293	-366	-361	-944	-2573	-518
step_sgd	-380	+1244	-484	-162	+1792	-47	-149	+627	+203	+1000
step_tween	+736	+1864	+849	-440	+2542	+302	-267	+943	+881	+965
step_tween_chain	-252	+1620	+419	+358	+1765	+166	+105	+1625	+1189	+1474
tween	+945	+3624	+1477	+302	+2658	+603	+655	+1929	+1353	+2026
tween_chain	+1299	+2031	+1204	+864	+2236	+318	+741	+2194	+955	+2400

AvailD vs sgd, every mode x dtype (cols 1-12)

AvailD vs sgd, every mode x dtype (cols 1-12)

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	+10	+7	+7	+7	+8	+8	+8	+8	+5	+9	+7	+6
Mesh[T]	+10	+8	+5	+6	+8	+9	+8	+8	+4	+8	+8	+6
Mesh[T]Alt	+2	+2	-0	-1	-0	+4	+2	+0	-3	+1	+1	+1
Mesh[T]Chain	+7	+3	+3	+3	+7	+5	+7	+2	-1	+7	+6	+2
Mesh[T][S]	+14	+12	+14	+15	+13	+12	+10	+12	+13	+14	+13	+14
Mesh[T][S][FP]	+13	+12	+14	+15	+14	+12	+12	+13	+13	+15	+14	+14
Mesh[T][S]Sparse	+15	+11	+14	+15	+14	+13	+14	+16	+15	+17	+15	+15
Step[T]Alt	-2	-2	-3	-3	-1	+1	-1	-3	-7	-2	-3	-1
Step[T][S]	+9	+10	+8	+9	+6	+8	+7	+11	+6	+9	+9	+8
[T]Alt	+2	+1	-1	+0	+0	+5	+3	+1	-4	+1	+1	+0
[T][S]	+6	+5	+6	+6	+4	+5	+5	-0	+6	+6	+4	+5
[T][S][FP]	+14	+12	+11	+15	+13	+12	+11	+12	+13	+15	+13	+14
[T][S][HP]	+14	+12	+14	+14	+14	+12	+12	+13	+13	+11	+13	+14
[T][S][HP]Async	+13	+13	+14	+14	+14	+12	+12	+13	+13	+14	+13	+14
[T][S][L]	+11	+9	+12	+10	+12	+10	+10	+12	+7	+10	+11	+11
[T][S][L]Cache	+13	+13	+14	+14	+14	+12	+12	+13	+14	+14	+12	+14
[T][S]Sparse	+15	+13	+15	+16	+16	+15	+13	+15	+15	+16	+15	+15
step_sgd	+2	+2	-1	-1	+1	+3	+1	+3	-1	+1	+1	-2
step_tween	+6	+4	+1	-0	+4	+7	+5	+5	-0	+5	+3	+0
step_tween_chain	+5	+6	+2	+2	+5	+7	+5	+6	+0	+5	+4	+1
tween	+8	+8	+7	+7	+8	+8	+7	+8	+3	+9	+7	+6
tween_chain	+8	+8	+8	+7	+8	+7	+8	+9	+5	+9	+7	+7

AvailD vs sgd, every mode x dtype (cols 13-24)

AvailD vs sgd, every mode x dtype (cols 13-24)

	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	+14	+9	+2	+7	+7	+3	+5	+8	+13	+6	+9	+5
Mesh[T]	+13	+10	+3	+7	+8	+3	+3	+6	+13	+3	+10	+4
Mesh[T]Alt	+5	+4	-1	-0	+2	-2	-3	-1	+7	-3	+4	-2
Mesh[T]Chain	+12	+4	-0	+5	+3	+2	+1	+5	+10	-0	+3	+0
Mesh[T][S]	+19	+14	+13	+14	+12	+13	+13	+13	+16	+13	+13	+13
Mesh[T][S][FP]	+20	+14	+12	+14	+12	+12	+13	+14	+16	+11	+14	+13
Mesh[T][S]Sparse	+21	+15	+15	+15	+14	+14	+14	+15	+19	+16	+14	+15
Step[T]Alt	+4	+1	-6	-3	-1	-8	-8	-2	+5	-5	+1	-5
Step[T][S]	+11	+11	+4	+7	+10	+5	+6	+5	+11	+7	+12	+7
[T]Alt	+6	+4	-1	-1	+2	-3	-3	-0	+9	-2	+4	-3
[T][S]	+13	+6	+6	+7	+4	+7	+7	+6	+9	+3	+6	+4
[T][S][FP]	+20	+13	+13	+14	+12	+12	+12	+11	+16	+12	+15	+13
[T][S][HP]	+20	+13	+12	+13	+11	+12	+13	+13	+17	+13	+15	+13
[T][S][HP]Async	+20	+13	+13	+11	+9	+12	+12	+14	+16	+12	+14	+13
[T][S][L]	+16	+12	+9	+9	+9	+7	+7	+10	+14	+10	+12	+10
[T][S][L]Cache	+19	+14	+13	+13	+12	+11	+12	+14	+16	+13	+14	+13
[T][S]Sparse	+22	+16	+12	+15	+13	+15	+16	+16	+18	+15	+15	+14
step_sgd	+6	+4	-3	-0	+2	-0	-1	-0	+5	-2	+4	-3
step_tween	+8	+8	-1	+2	+5	-0	-1	+1	+10	+0	+8	-1
step_tween_chain	+9	+8	-2	+3	+5	-0	+1	+3	+12	+0	+9	-0
tween	+13	+9	+2	+6	+7	+3	+5	+7	+12	+5	+10	+4
tween_chain	+14	+9	+4	+8	+8	+4	+4	+8	+13	+5	+10	+6

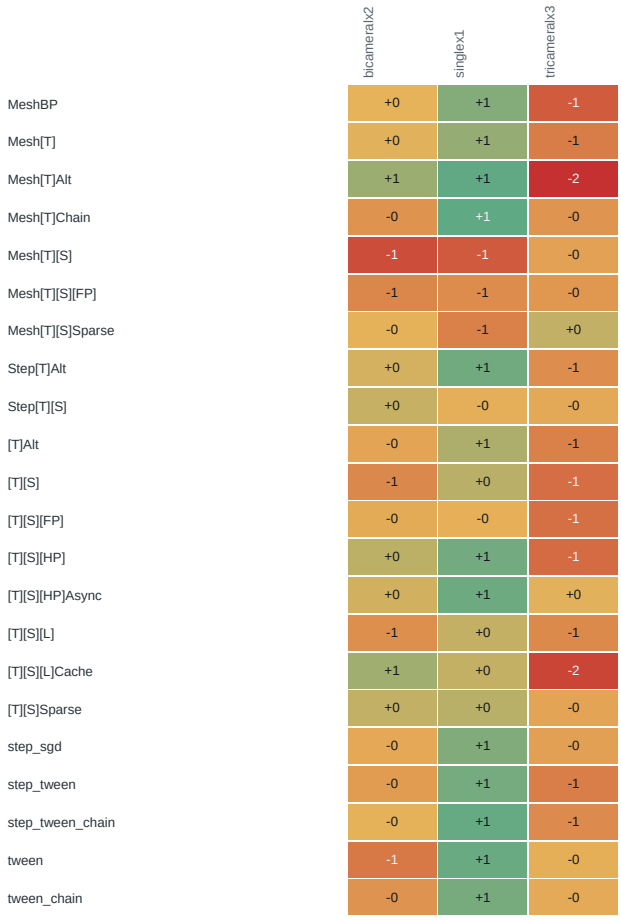
AvailD vs sgd, every mode x dtype (cols 25-34)

AvailD vs sgd, every mode x dtype (cols 25-34)

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	+7	+8	+4	+6	+8	+4	+4	+6	+8	+6
Mesh[T]	+5	+7	+4	+5	+8	+4	+5	+4	+7	+5
Mesh[T]Alt	-1	-0	-0	-3	+1	-2	-4	-3	+2	-1
Mesh[T]Chain	+2	+3	+1	-0	+5	+1	-0	+2	+2	+2
Mesh[T][S]	+12	+15	+15	+11	+15	+13	+13	+12	+11	+11
Mesh[T][S][FP]	+12	+15	+13	+11	+15	+12	+13	+12	+12	+12
Mesh[T][S]Sparse	+13	+17	+17	+12	+16	+16	+15	+13	+12	+15
Step[T]Alt	-4	-3	-5	-4	-2	-7	-8	-4	-0	-4
Step[T][S]	+7	+9	+7	+7	+9	+5	+4	+2	+9	+6
[T]Alt	-2	-0	-0	-2	+0	-2	-3	-2	+2	-1
[T][S]	+3	+7	+7	+5	+6	+7	+6	+3	+4	+6
[T][S][FP]	+13	+15	+16	+12	+15	+13	+12	+12	+12	+13
[T][S][HP]	+12	+15	+14	+12	+14	+14	+12	+12	+11	+14
[T][S][HP]Async	+13	+15	+15	+11	+15	+12	+11	+11	+12	+14
[T][S][L]	+11	+12	+11	+9	+12	+8	+7	+9	+10	+10
[T][S][L]Cache	+13	+15	+15	+12	+14	+13	+13	+12	+9	+13
[T][S]Sparse	+14	+16	+17	+12	+16	+15	+14	+11	+13	+15
step_sgd	-2	+1	-2	-2	+1	+0	-0	-3	+1	-2
step_tween	+1	+3	+1	-0	+3	+0	-1	+0	+5	-1
step_tween_chain	+1	+3	+0	+1	+3	+1	+0	+1	+5	+1
tween	+3	+8	+4	+5	+8	+4	+3	+5	+8	+6
tween_chain	+7	+9	+5	+5	+9	+4	+4	+6	+8	+6

AccD vs sgd, every mode x arch

AccD vs sgd, every mode x arch



Family collapse - Step* vs non-Step

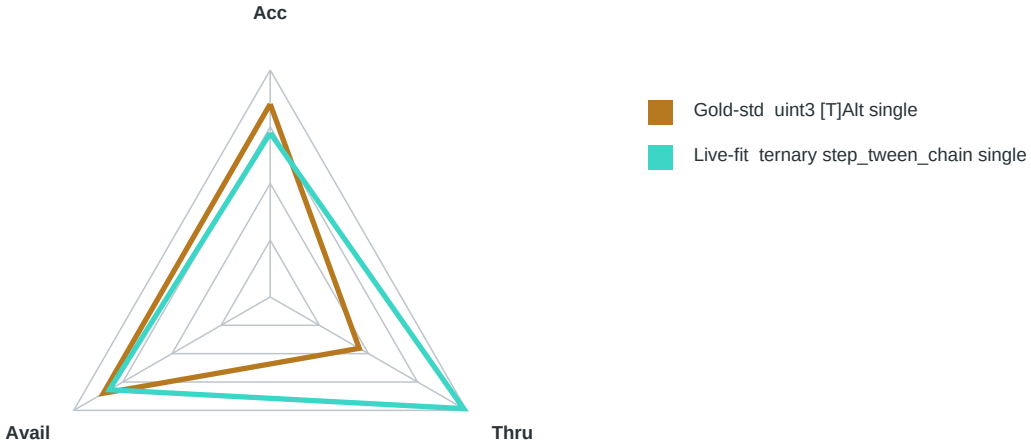
Step* is a 1D pipe (one sample enters layer 0 per tick; output is the sample that entered depth ticks ago). Non-Step of the same family is a full-chain update. AccD is a real scheduler split, not leftover warm-up forwards.

step	plain	n	mean |AccD|
Step[T]Alt	[T]Alt	102	3.23
Step[T][S]	[T][S]	102	2.85
step_sgd	sgd	102	2.37
step_tween	tween	102	2.50
step_tween_chain	tween_chain	102	2.04

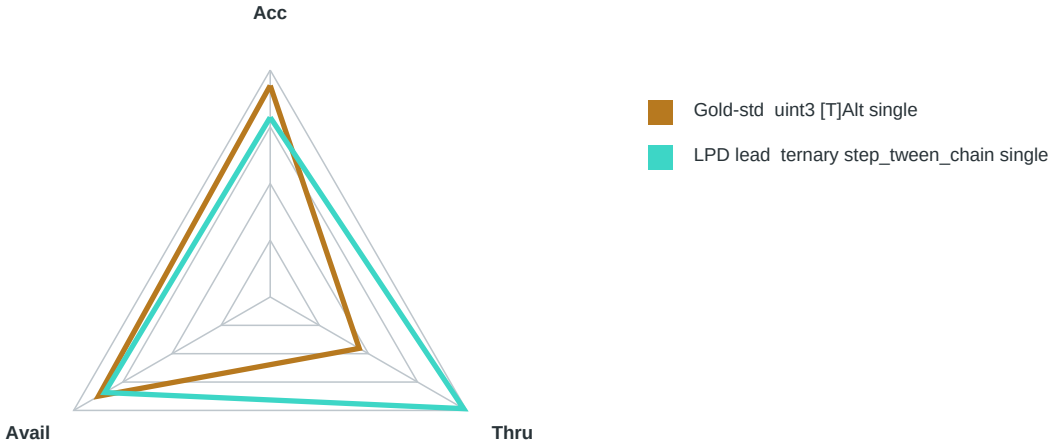
Consciousness - Acc, Throughput, Availability

Synthetic organism / Lucy density: can the net run and train at the same time in a small box. Lucy Score = Throughput x Availability x Acc / 10,000 (hard Acc; SoftAcc is serve-confidence only). SGD that blocks serve dies on Availability. Q = geomean Acc/Thru/Avail vs learner peaks (traps do not set Thru/Avail). LPD = Q x shrink vs Acc-champ RAM; 0 unless Acc keep >=70%. Gold = all 3 pillars >=80% at <=20% Acc-champ RAM. Gold-std = Acc >=80% plus Thru or Avail, then smallest then fastest. Score/MiB is the binary trap.
Acc champ complex128|none|Mesh[T][S][FP]|tricameral|simd Acc 41.5 Thru 6582 Avail 55.4% 4.5 KiB (RAM reference)
Lucy Score champ (T x Avail x Acc) float32|none|[T][S][L]|single|simd Score 18354.6 Acc 28.2 Soft 25 0.1 KiB
Live-fit champ (best Q) ternary|none|step_tween_chain|single|simd Acc 30.0 Thru 122095 Avail 50.1% 0.0 KiB
Gold-std (2+ pillars, Acc keep >= 80%, then smallest then fastest): uint3|none|[T]Alt|single|simd mode [T]Alt Acc 35.3 Thru 56209 0.0 KiB
Board fastest float32|none|step_sgd|single|simd Thru 143816 (traps may own this) Best availability fp8e4m3|none|[T][S]Sparse|bicameral|simd 61.2%
Learner Thru peak 124042 learner Avail peak 61.2%

Consciousness radar - Acc / Thru / Avail vs learner peaks



Memory density radar - same pillars x shrink vs Acc champ (traps sit at origin)



No gold cell yet. Need all three pillars at 80% of learner peaks in one fifth of Acc-champ RAM.

Gold-standard train modes - 2+ pillars, Acc keep >= 80%, smallest then fastest

Mode	n	Acc	KiB	Thru	Cell
[T]Alt	1	35.3	0.0	56209	uint3 [T]Alt single
[T][S][HP]Async	5	37.0	0.0	62149	int5 [T][S][HP]Async single / uint [T][S][HP]Async single
Mesh[T]Alt	1	34.9	0.0	45009	uint4 Mesh[T]Alt single
[T][S][HP]	1	33.2	0.0	20774	binary [T][S][HP] bicameral
[T][S][L]	2	35.1	0.1	32733	int2 [T][S][L] bicameral
[T][S][L]Cache	2	37.5	0.1	28396	ternary [T][S][L]Cache bicameral
[T][S]Sparse	6	37.5	0.1	22785	int2 [T][S]Sparse bicameral
Mesh[T][S][FP]	3	41.5	0.1	42722	int16 Mesh[T][S][FP] single
Mesh[T][S]	2	35.1	0.1	11708	uint2 Mesh[T][S] tricameral / uint16 Mesh[T][S] bicameral
[T][S][FP]	2	36.3	0.1	23669	int4 [T][S][FP] tricameral
Mesh[T][S]Sparse	2	35.0	2.2	10094	float64 Mesh[T][S]Sparse tricameral

Near-gold - 2+ pillars, RAM <= 50% of Acc champ

Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB

Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
near	uint3 [T]Alt single	85	45	85	69	0	32.0	22.05	35.3	56209	0.0
near	int5 [T][S][HP]Async single	83	37	95	66	0	32.0	21.16	34.5	45462	0.0
near	uint4 Mesh[T]Alt single	84	36	82	63	0	32.0	20.12	34.9	45009	0.0
near	int16 Mesh[T][S][FP] single	81	34	88	63	1	32.0	20.01	33.6	42722	0.1
near	ternary [T][S][L]Cache bicameral	90	23	93	58	1	32.0	18.44	37.5	28396	0.1
near	int2 [T][S][L] bicameral	82	26	87	57	1	32.0	18.33	34.0	32733	0.1
near	int2 [T][S]Sparse bicameral	85	18	96	53	1	32.0	17.03	35.4	22785	0.1
near	int4 [T][S][FP] tricameral	83	19	91	53	3	32.0	16.80	34.5	23669	0.1
near	binary [T][S][HP] bicameral	80	17	93	50	1	32.0	16.01	33.2	20774	0.0
near	ternary [T][S]Sparse tricameral	84	14	94	49	2	32.0	15.55	34.9	17957	0.1
near	uint2 [T][S]Sparse tricameral	82	8	95	40	2	32.0	12.88	34.1	10326	0.1
near	uint [T][S][HP]Async single	83	50	90	72	6	17.7	12.74	34.4	62149	0.3

Lucy density (LPD) - Q x shrink vs Acc-champ RAM; 0 if Acc keep < 70%

Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
-	ternary step_tween_chain single	72	98	82	83	0	32.0	26.72	30.0	122095	0.0
-	bfloat16 tween_chain single	72	100	75	82	1	32.0	26.10	30.1	124042	0.1
-	bfloat16 MeshBP single	71	93	78	80	1	32.0	25.75	29.6	115976	0.1
-	uint32 [T][S][L] single	74	83	83	80	3	32.0	25.60	30.8	103150	0.1
-	fp8e4m3 [T][S][L] single	71	88	81	80	1	32.0	25.51	29.5	109504	0.0
-	uint2 tween single	74	82	84	80	0	32.0	25.49	30.7	101553	0.0
-	int8 [T][S][FP] single	71	89	79	79	1	32.0	25.39	29.5	110799	0.0
-	uint2 Mesh[T]Chain single	72	79	87	79	0	32.0	25.33	30.0	98216	0.0
-	uint8 [T]Alt single	77	78	79	78	1	32.0	24.90	31.8	96721	0.0
-	uint2 Step[T][S] single	72	77	84	78	0	32.0	24.84	29.9	95562	0.0
-	bfloat16 step_sgd single	70	99	64	76	1	32.0	24.44	29.2	122487	0.1
-	uint16 [T][S][L] single	71	73	85	76	1	32.0	24.38	29.3	91005	0.1
-	nf4 tween single	70	72	87	76	0	32.0	24.38	29.1	89434	0.0
-	fp8e5m2 [T][S][L]Cache single	78	70	80	76	1	32.0	24.30	32.2	87171	0.0
-	ternary [T]Alt single	70	79	77	75	0	32.0	24.14	29.2	98233	0.0
-	int2 [T]Alt single	70	79	77	75	0	32.0	24.08	29.1	98411	0.0
-	float32 [T][S][L]Cache single	71	83	72	75	3	32.0	24.06	29.5	102650	0.1
-	nf4 Step[T][S] single	76	64	87	75	0	32.0	24.02	31.4	79257	0.0
-	uint16 [T][S][FP] single	70	72	84	75	1	32.0	24.02	29.1	88932	0.1
-	int2 [T][S][HP]Async single	76	69	77	74	0	32.0	23.54	31.5	85103	0.0

Consciousness rank - Q = geomean Acc/Thru/Avail keep

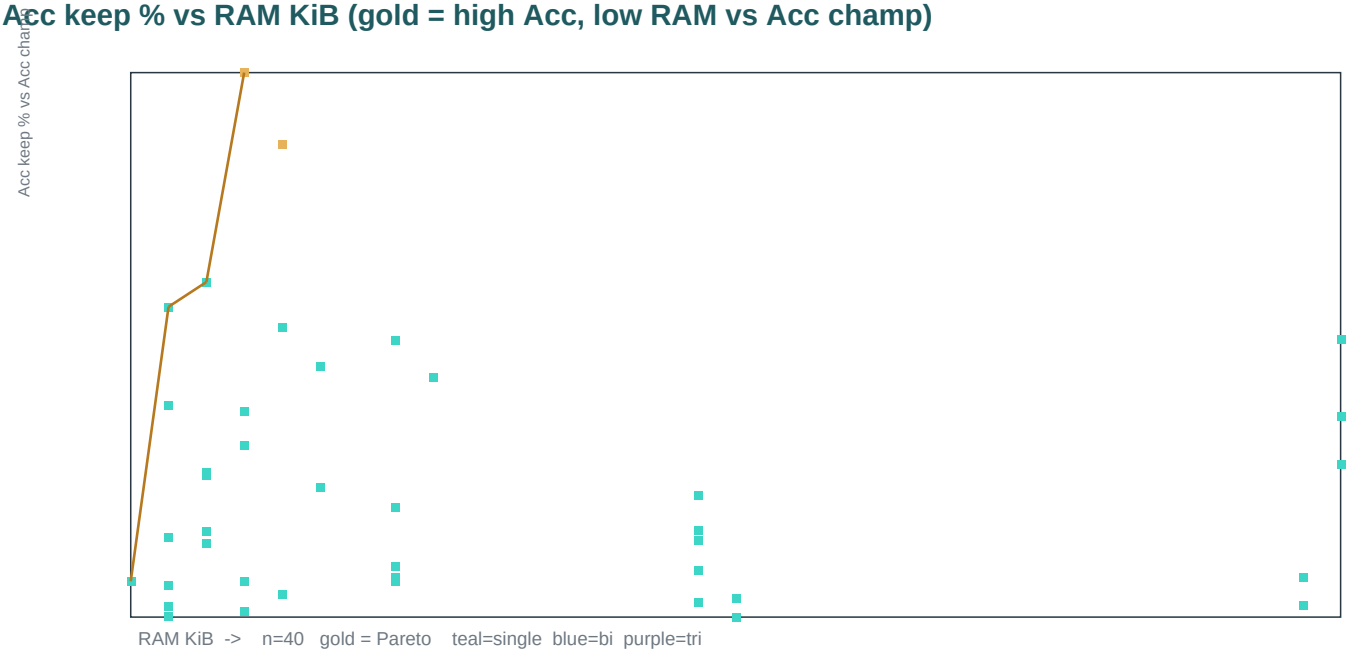
Band	Cell	Acc%	Thru%	Avail%	Q%	LPD	Thru	Avail
-	ternary step_tween_chain single	72	98	82	83	26.72	122095	50.1
-	bfloat16 tween_chain single	72	100	75	82	26.10	124042	45.8
-	bfloat16 MeshBP single	71	93	78	80	25.75	115976	47.9
-	uint32 [T][S][L] single	74	83	83	80	25.60	103150	50.7
-	fp8e4m3 [T][S][L] single	71	88	81	80	25.51	109504	49.4
-	uint2 tween single	74	82	84	80	25.49	101553	51.1
-	int8 [T][S][FP] single	71	89	79	79	25.39	110799	48.1
-	uint2 Mesh[T]Chain single	72	79	87	79	25.33	98216	53.0
-	float64 [T][S][L] single	71	86	80	79	14.18	107185	48.8
-	uint8 [T]Alt single	77	78	79	78	24.90	96721	48.3

Trap - tiny RAM, Acc keep < 70% (Score/MiB and SoftAcc Score lie here)

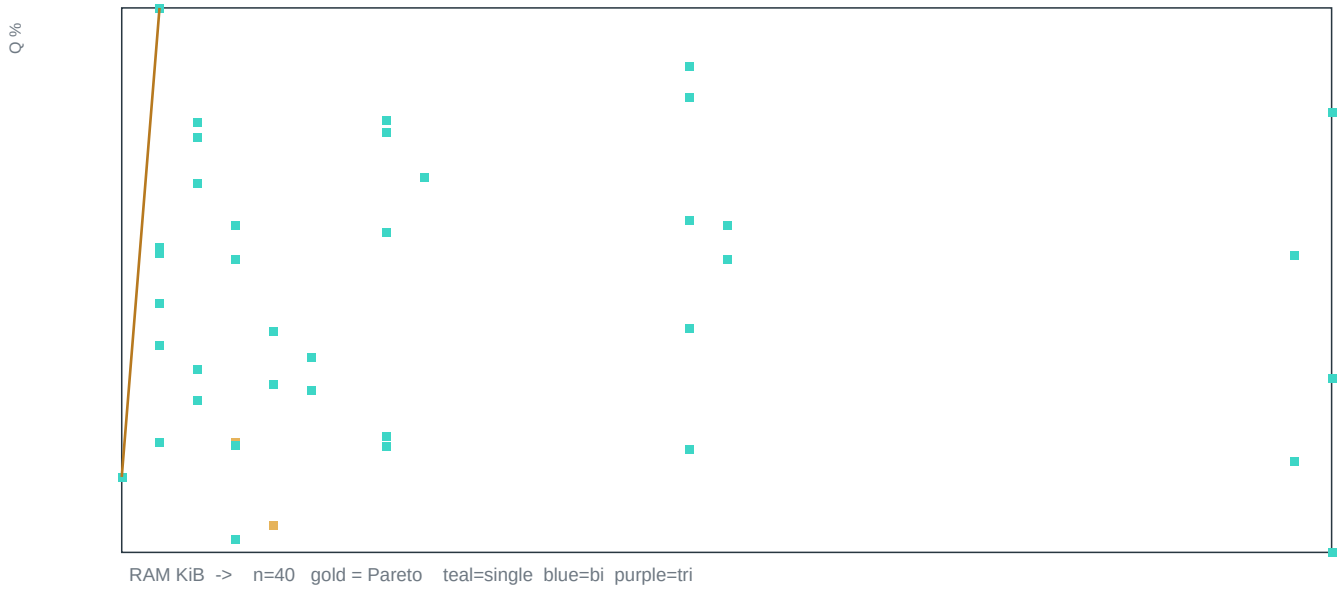
Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB

trap	binary sgd single	48	87	56	61	0	32.0	0.00	19.8	107775	0.0
trap	binary step_sgd single	60	98	64	72	0	32.0	0.00	25.1	122153	0.0
trap	binary tween single	58	100	77	76	0	32.0	0.00	24.0	130195	0.0
trap	binary tween_chain single	67	97	74	78	0	32.0	0.00	27.6	120036	0.0
trap	binary step_tween single	62	84	69	71	0	32.0	0.00	25.6	104158	0.0
trap	binary step_tween_chain single	57	94	78	75	0	32.0	0.00	23.7	117033	0.0
trap	binary MeshBP single	56	89	75	72	0	32.0	0.00	23.2	110166	0.0
trap	binary Mesh[T] single	69	96	79	81	0	32.0	0.00	28.7	119517	0.0
trap	binary Mesh[T]Chain single	65	100	79	80	0	32.0	0.00	26.9	127017	0.0
trap	binary [T][S] single	53	58	65	58	0	32.0	0.00	22.0	71731	0.0

Acc keep % vs RAM KiB (gold = high Acc, low RAM vs Acc champ)



Q% vs RAM KiB (gold = high consciousness, low RAM)



Q% vs shrink vs Acc champ (gold = upper right)

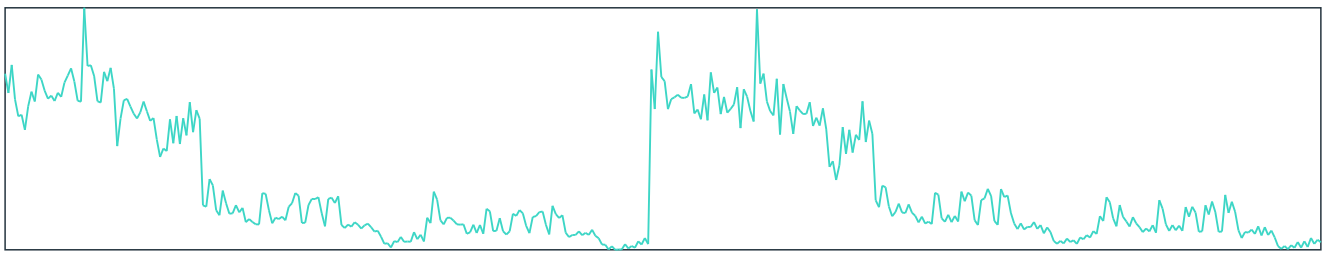
Q% vs shrink vs Acc champ (gold = upper right)



Top Lucy density (LPD)

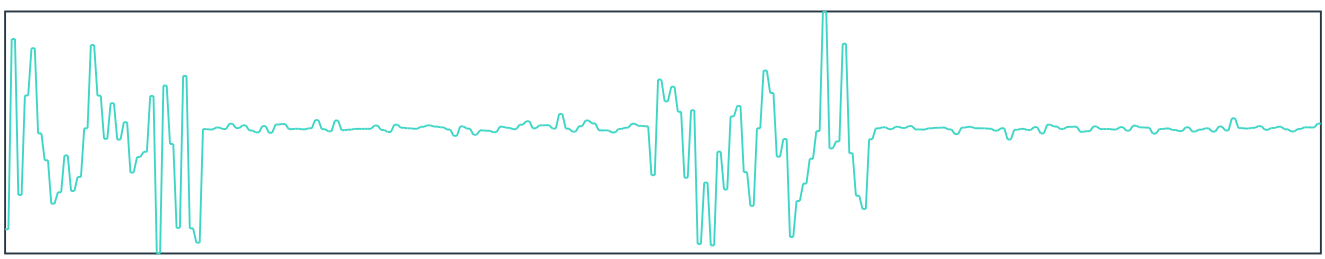


Live pulse (Score)



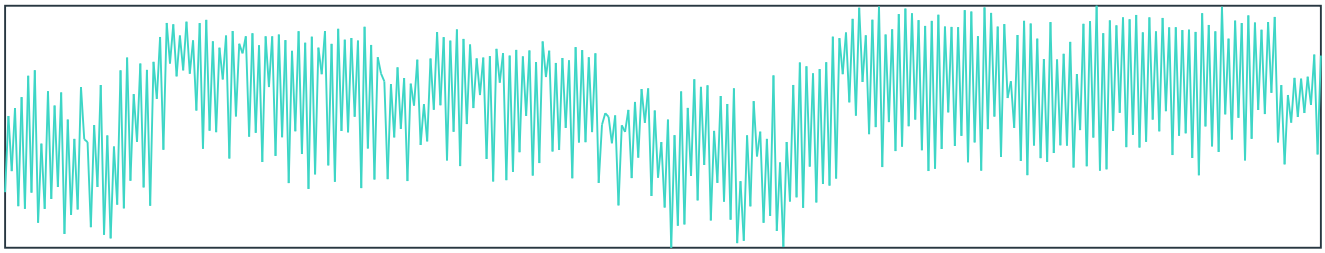
n=400 min=404.68 max=9176.72

Live pulse (SoftAcc)



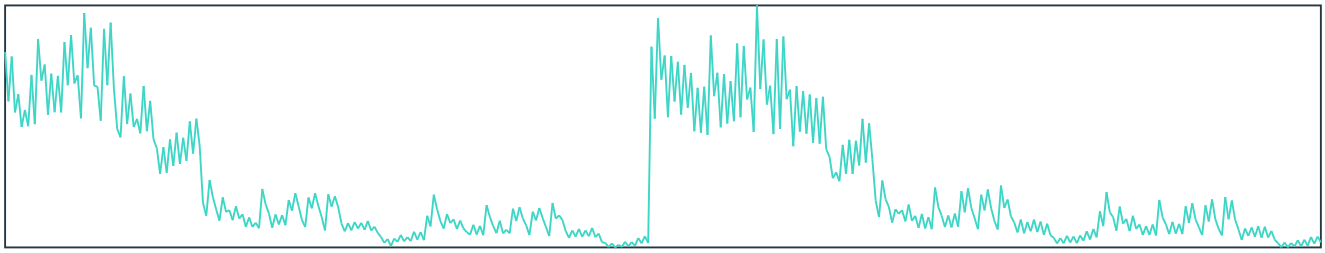
n=400 min=24.69 max=25.29

Live pulse (Availability)



n=400 min=36.23 max=60.04

Live pulse (Throughput)



n=400 min=3287.91 max=80694.89

Queue by train mode (this epoch)

Mode	Done	Run	Left	Total