tide test53-dayroute

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 - lr 20000 - 2026-08-27 00:56:58 - 0.0.0.0:8080
This epoch 3944 / 3944 cells. Recorded 3944 results. Learning rate 20000.
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.
dayroute - dense - 3-cam x mode x dtype x funny-LR

Lucy champions (this tide)

Axis	Cell	Score	Soft	Acc	Thru	Avail
hard acc	dense|uint64|Mesh[T]Alt|lr=100m	0.00	78.6	0.0	2251.9	13.8
throughput	dense|float32|[T][S]Sparse|lr=20k	2548.51	0.0	24.6	41510.4	24.9
availability	dense|complex64|[T][S]Sparse|lr=100m	2282.54	0.0	24.2	12760.9	74.0
lucy score	dense|float32|Mesh[T]|lr=20k	3477.37	0.0	24.8	39100.0	35.9
mobile score (trap)	dense|binary|[T][S]Sparse|lr=20k	2611.25	0.7	24.7	20306.9	52.1
acc/sec	dense|uint6|Step[T][S][HP]Async|lr=1m	299.10	0.0	50.0	3798.0	32.9

Lucy axis champions (this tide)

Axis	Mode	DType	Arch	Value
hard_acc	step_tween_chain	int16	tricameralx3	50.00
throughput	[T][S]Sparse	float32	tricameralx3	41510.41
availability	[T][S]Sparse	complex64	tricameralx3	73.97
score	Mesh[T]	float32	tricameralx3	3477.37
soft_acc	Mesh[T]Alt	uint64	tricameralx3	78.58
acc_thru	[T][S]Sparse	float32	tricameralx3	10229.95
realtime	Mesh[T]	float32	tricameralx3	14037.65
adapt	Step[T][S][L]Cache	nf4	tricameralx3	37.61
keep_learn	Step[T][S][HP]Async	uint6	tricameralx3	25.00
acc_per_sec	Step[T][S][HP]Async	uint6	tricameralx3	25.00
consistency	Step[T]Alt	nf4	tricameralx3	100.00
stability	sgd	float64	tricameralx3	100.00
mobile_score	[T][S]Sparse	binary	tricameralx3	5432724.16
lpd	Mesh[T][S][FP]	binary	tricameralx3	7.50
mspeed	[T][S][HP]	int4	tricameralx3	1.00
mavail	Step[T][S][HP]Async	uint6	tricameralx3	1.00
mix	Step[T][S]	ternary	tricameralx3	0.94
gold_std	Mesh[T][S][FP]	binary	tricameralx3	0.49

Best settings per train mode

Mode	DType	Format	Score	Soft	Acc	Avail	n
Mesh[T]	float32	none	3477.4	0.0	24.8	35.9	136
Step[T][S]Sparse	float64	none	3418.9	0.0	25.9	53.2	136
[T][S]Sparse	float64	none	3364.8	0.0	24.6	51.9	136
Mesh[T][S]Sparse	float64	none	3343.7	0.0	24.7	43.8	136
[T]Alt	float32	none	1854.6	0.0	24.7	20.4	136
Mesh[T]Alt	float32	none	1083.1	0.0	24.9	28.5	136
Mesh[T][S][FP]	float32	none	951.8	0.0	22.7	35.8	136
[T][S]	float64	none	938.9	0.0	24.7	27.7	136
[T][S][HP]	float64	none	887.3	0.0	24.7	25.5	136
Mesh[T][S]	float64	none	833.7	0.0	25.0	29.9	136
Step[T][S][HP]	float64	none	798.4	0.0	24.3	24.6	136

Step[T][S][FP]	float64	none	795.1	0.0	24.2	25.3	136
[T][S][FP]	float64	none	750.1	0.0	24.9	23.0	136
[T][S][L]Cache	int64	none	748.6	0.0	24.8	30.4	136
Step[T][S][HP]Async	float64	none	728.5	0.0	24.7	23.0	136
[T][S][HP]Async	float64	none	727.5	0.0	24.5	22.6	136
Step[T][S]	binary	none	718.8	0.0	24.3	30.8	136
Step[T][S][L]Cache	int	none	665.9	0.0	24.2	31.9	136
Step[T][S][L]	float64	none	607.8	0.0	23.8	28.4	136
[T][S][L]	float64	none	604.3	0.0	24.6	21.8	136
step_tween	float64	none	447.8	0.0	24.7	17.6	136
Mesh[T]Chain	fp4	none	366.1	0.0	24.7	21.3	136
step_tween_chain	float64	none	350.0	0.0	24.6	16.1	135
tween	float32	none	347.5	0.0	24.7	11.9	136
MeshBP	float32	none	338.8	0.0	24.6	16.1	136
step_sgd	float64	none	297.7	0.0	24.7	15.0	136
tween_chain	float64	none	259.2	0.0	24.9	18.5	136
sgd	int32	none	246.7	0.0	24.9	25.1	136
Step[T]Alt	bfloat16	none	203.9	0.0	31.3	18.1	136

Best dtype per mode

Mode	Winner dtype	Score	Soft	Acc
Mesh[T]	float32	3477.4	0.0	24.8
Step[T][S]Sparse	float64	3418.9	0.0	25.9
[T][S]Sparse	float64	3364.8	0.0	24.6
Mesh[T][S]Sparse	float64	3343.7	0.0	24.7
[T]Alt	float32	1854.6	0.0	24.7
Mesh[T]Alt	float32	1083.1	0.0	24.9
Mesh[T][S][FP]	float32	951.8	0.0	22.7
[T][S]	float64	938.9	0.0	24.7
[T][S][HP]	float64	887.3	0.0	24.7
Mesh[T][S]	float64	833.7	0.0	25.0
Step[T][S][HP]	float64	798.4	0.0	24.3
Step[T][S][FP]	float64	795.1	0.0	24.2
[T][S][FP]	float64	750.1	0.0	24.9
[T][S][L]Cache	int64	748.6	0.0	24.8
Step[T][S][HP]Async	float64	728.5	0.0	24.7
[T][S][HP]Async	float64	727.5	0.0	24.5
Step[T][S]	binary	718.8	0.0	24.3
Step[T][S][L]Cache	int	665.9	0.0	24.2
Step[T][S][L]	float64	607.8	0.0	23.8
[T][S][L]	float64	604.3	0.0	24.6
step_tween	float64	447.8	0.0	24.7
Mesh[T]Chain	fp4	366.1	0.0	24.7
step_tween_chain	float64	350.0	0.0	24.6
tween	float32	347.5	0.0	24.7
MeshBP	float32	338.8	0.0	24.6
step_sgd	float64	297.7	0.0	24.7
tween_chain	float64	259.2	0.0	24.9
sgd	int32	246.7	0.0	24.9
Step[T]Alt	bfloat16	203.9	0.0	31.3

Best mode per dtype

DType	Winner mode	Score	Soft	Acc
float32	Mesh[T]	3477.4	0.0	24.8
float64	Step[T][S]Sparse	3418.9	0.0	25.9
bfloat16	Mesh[T][S]Sparse	2990.9	0.0	26.6
uint16	Mesh[T][S]Sparse	2760.8	0.6	24.6
int64	Mesh[T][S]Sparse	2691.8	0.0	25.0
uint8	[T][S]Sparse	2663.2	0.6	24.8
int8	Mesh[T]	2615.2	0.0	24.8
binary	[T][S]Sparse	2611.2	0.7	24.7
uint64	Mesh[T][S]Sparse	2568.6	0.6	24.6
int32	Mesh[T]	2534.9	0.0	24.8
int4	[T][S]Sparse	2518.4	0.6	24.6
complex64	[T][S]Sparse	2508.0	0.0	24.8
int2	Mesh[T]	2506.6	0.0	24.8
complex128	[T][S]Sparse	2455.0	0.0	24.6
uint32	Mesh[T]	2454.9	0.0	24.7
fp8e4m3	[T][S]Sparse	2430.3	0.0	24.6
uint4	Mesh[T]	2424.5	0.0	24.7
fp8e5m2	[T][S]Sparse	2408.9	0.0	24.7
float16	Mesh[T][S]Sparse	2408.7	0.0	24.7
int16	Mesh[T]	2309.3	0.0	24.7
fp4	Mesh[T]	2235.1	0.0	24.4
uint2	[T][S]Sparse	2170.3	0.6	24.4
ternary	Mesh[T]	2167.3	0.0	24.7
int	Mesh[T][S]Sparse	2141.9	0.0	24.9
uint	Mesh[T][S]Sparse	2102.6	0.7	24.3
uintptr	Mesh[T]	1987.5	0.0	24.8
int3	Mesh[T]	1620.9	0.0	24.6
uint3	Mesh[T]	1532.1	0.0	24.5
uint5	Mesh[T][S]Sparse	1442.7	1.0	24.7
nf4	[T][S]Sparse	1427.0	5.2	25.5
int6	Mesh[T][S]Sparse	1354.0	1.4	24.6
int5	Step[T][S]Sparse	1350.0	1.9	24.6
uint6	[T][S]Sparse	1319.0	1.0	24.6
fp6	Mesh[T]	1023.6	0.0	24.7

Leaderboard (Lucy Score)

#	Cell	Score	Soft	Acc	Thru	Avail
1	dense|float32|Mesh[T]|lr=20k	3477.4	0.0	24.8	39100.0	35.9
2	dense|float64|Step[T][S]Sparse|lr=100m	3418.9	0.0	25.9	24844.7	53.2
3	dense|float64|[T][S]Sparse|lr=10m	3364.8	0.0	24.6	26347.1	51.9
4	dense|float64|Mesh[T][S]Sparse|lr=20k	3343.7	0.0	24.7	30862.4	43.8
5	dense|float64|[T][S]Sparse|lr=20k	3324.8	0.0	24.6	30918.9	43.8
6	dense|float32|Mesh[T][S]Sparse|lr=20k	3288.7	0.0	24.6	33123.4	40.4
7	dense|float64|Step[T][S]Sparse|lr=20k	3207.6	0.0	24.7	29723.3	43.7
8	dense|float64|Mesh[T]|lr=20k	3084.7	0.0	24.6	34367.2	36.6
9	dense|bfloat16|Mesh[T][S]Sparse|lr=100m	2990.9	0.0	26.6	17877.3	62.9
10	dense|float32|Mesh[T]|lr=10m	2928.1	0.0	24.8	30564.4	38.7
11	dense|float64|Mesh[T][S]Sparse|lr=100m	2855.6	0.0	26.8	24257.6	43.9
12	dense|float32|Mesh[T]|lr=1m	2764.7	0.0	24.7	33591.8	33.3
13	dense|uint16|Mesh[T][S]Sparse|lr=20k	2760.8	0.6	24.6	20379.5	55.0
14	dense|float64|Mesh[T][S]Sparse|lr=1m	2746.8	0.0	24.6	26577.4	42.0

15	dense|float64|Step[T][S]Sparse|lr=10m	2738.9	0.0	24.1	23591.4	48.1
16	dense|int64|Mesh[T][S]Sparse|lr=1m	2691.8	0.0	25.0	18945.3	56.9
17	dense|float64|Mesh[T]|lr=10m	2674.5	0.0	24.6	26960.0	40.3
18	dense|float64|Step[T][S]Sparse|lr=1m	2671.3	0.0	24.6	26163.3	41.5
19	dense|uint8|[T][S]Sparse|lr=20k	2663.2	0.6	24.8	21156.0	50.8
20	dense|int8|Mesh[T]|lr=20k	2615.2	0.0	24.8	23186.6	45.5

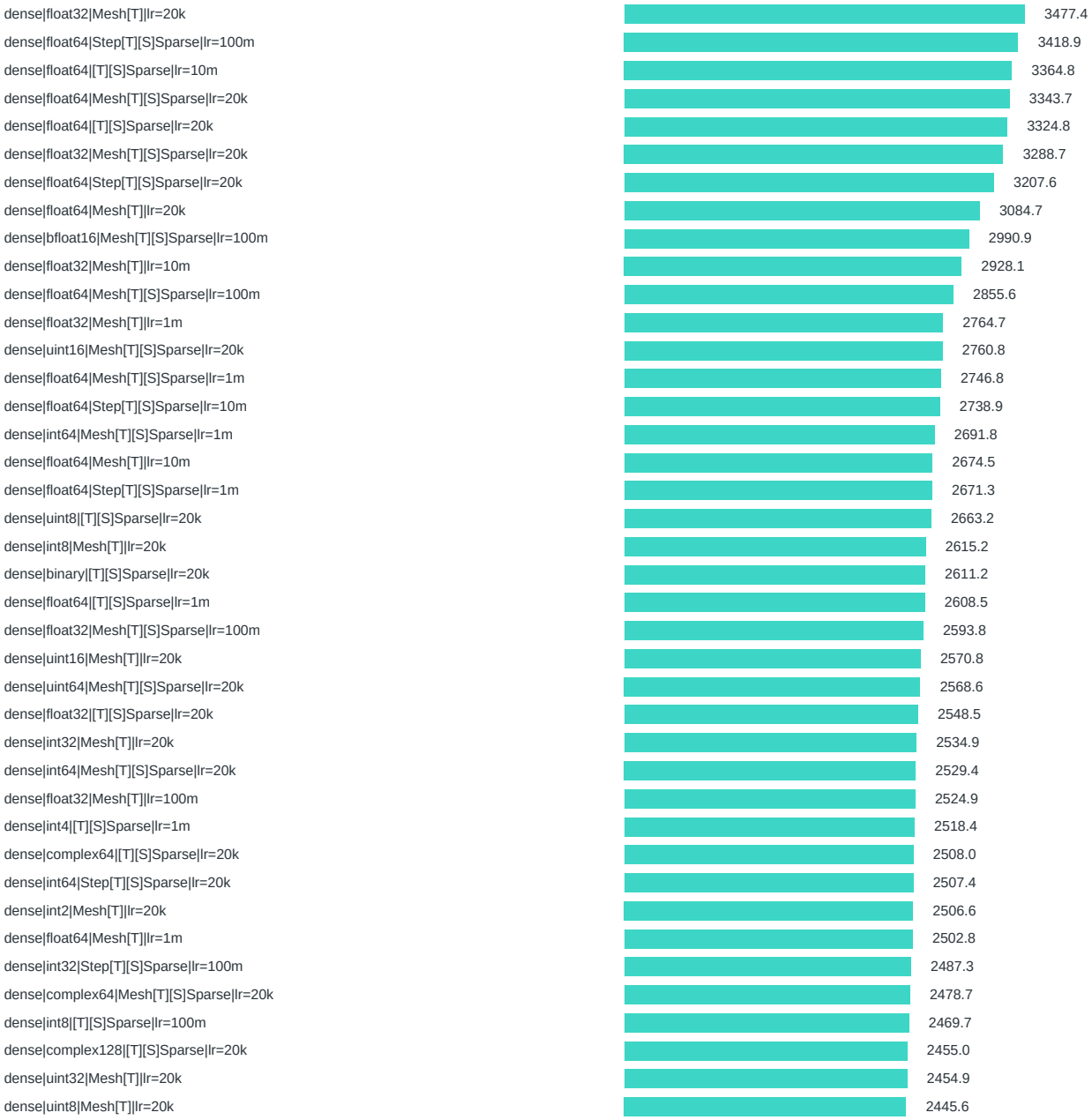
Leaderboard (SoftAcc)

#	Cell	Score	Soft	Acc	Thru	Avail
1	dense|int32|Step[T][S]Sparse|lr=100m	2487.3	0.8	25.0	16856.8	59.0
2	dense|int8|[T][S]Sparse|lr=100m	2469.7	0.8	26.5	17048.7	54.7
3	dense|binary|[T][S]Sparse|lr=20k	2611.2	0.7	24.7	20306.9	52.1
4	dense|uint64|Mesh[T][S]Sparse|lr=20k	2568.6	0.6	24.6	19177.5	54.4
5	dense|uint16|Mesh[T][S]Sparse|lr=20k	2760.8	0.6	24.6	20379.5	55.0
6	dense|int4|[T][S]Sparse|lr=1m	2518.4	0.6	24.6	18399.8	55.7
7	dense|uint8|[T][S]Sparse|lr=20k	2663.2	0.6	24.8	21156.0	50.8
8	dense|uint8|Mesh[T]|lr=20k	2445.6	0.0	24.5	22561.5	44.2
9	dense|float64|Mesh[T][S]Sparse|lr=1m	2746.8	0.0	24.6	26577.4	42.0
10	dense|float64|[T][S]Sparse|lr=1m	2608.5	0.0	24.7	26821.0	39.3
11	dense|float64|Step[T][S]Sparse|lr=20k	3207.6	0.0	24.7	29723.3	43.7
12	dense|float32|Mesh[T][S]Sparse|lr=20k	3288.7	0.0	24.6	33123.4	40.4
13	dense|float64|Mesh[T][S]Sparse|lr=100m	2855.6	0.0	26.8	24257.6	43.9
14	dense|float32|Mesh[T]|lr=100m	2524.9	0.0	24.5	30052.7	34.3
15	dense|float64|[T][S]Sparse|lr=20k	3324.8	0.0	24.6	30918.9	43.8
16	dense|float64|Mesh[T]|lr=10m	2674.5	0.0	24.6	26960.0	40.3
17	dense|complex64|[T][S]Sparse|lr=20k	2508.0	0.0	24.8	18519.2	54.6
18	dense|float32|Mesh[T]|lr=20k	3477.4	0.0	24.8	39100.0	35.9
19	dense|uint16|Mesh[T]|lr=20k	2570.8	0.0	24.7	21602.0	48.1
20	dense|float64|Step[T][S]Sparse|lr=100m	3418.9	0.0	25.9	24844.7	53.2

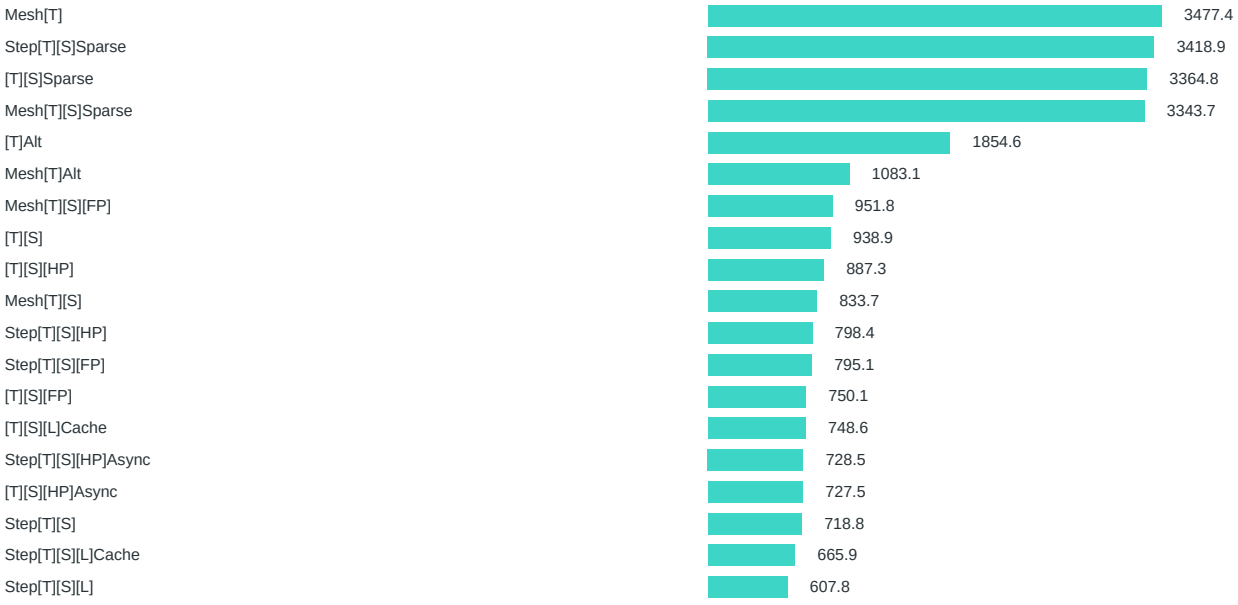
Leaderboard (hard Acc)

#	Cell	Score	Soft	Acc	Thru	Avail
1	dense|float64|Mesh[T][S]Sparse|lr=100m	2855.6	0.0	26.8	24257.6	43.9
2	dense|bfloat16|Mesh[T][S]Sparse|lr=100m	2990.9	0.0	26.6	17877.3	62.9
3	dense|int8|[T][S]Sparse|lr=100m	2469.7	0.8	26.5	17048.7	54.7
4	dense|float64|Step[T][S]Sparse|lr=100m	3418.9	0.0	25.9	24844.7	53.2
5	dense|int32|Step[T][S]Sparse|lr=100m	2487.3	0.8	25.0	16856.8	59.0
6	dense|int64|Mesh[T][S]Sparse|lr=1m	2691.8	0.0	25.0	18945.3	56.9
7	dense|float32|Mesh[T][S]Sparse|lr=100m	2593.8	0.0	24.9	26517.8	39.2
8	dense|int2|Mesh[T]|lr=20k	2506.6	0.0	24.8	21365.0	47.3
9	dense|complex64|[T][S]Sparse|lr=20k	2508.0	0.0	24.8	18519.2	54.6
10	dense|int32|Mesh[T]|lr=20k	2534.9	0.0	24.8	22771.7	44.9
11	dense|int8|Mesh[T]|lr=20k	2615.2	0.0	24.8	23186.6	45.5
12	dense|float32|Mesh[T]|lr=20k	3477.4	0.0	24.8	39100.0	35.9
13	dense|float32|Mesh[T]|lr=10m	2928.1	0.0	24.8	30564.4	38.7
14	dense|uint8|[T][S]Sparse|lr=20k	2663.2	0.6	24.8	21156.0	50.8
15	dense|float32|Mesh[T]|lr=1m	2764.7	0.0	24.7	33591.8	33.3
16	dense|uint16|Mesh[T]|lr=20k	2570.8	0.0	24.7	21602.0	48.1
17	dense|float64|Mesh[T][S]Sparse|lr=20k	3343.7	0.0	24.7	30862.4	43.8
18	dense|complex64|Mesh[T][S]Sparse|lr=20k	2478.7	0.0	24.7	18815.7	53.3
19	dense|float64|[T][S]Sparse|lr=1m	2608.5	0.0	24.7	26821.0	39.3
20	dense|float64|Step[T][S]Sparse|lr=20k	3207.6	0.0	24.7	29723.3	43.7

Top scores



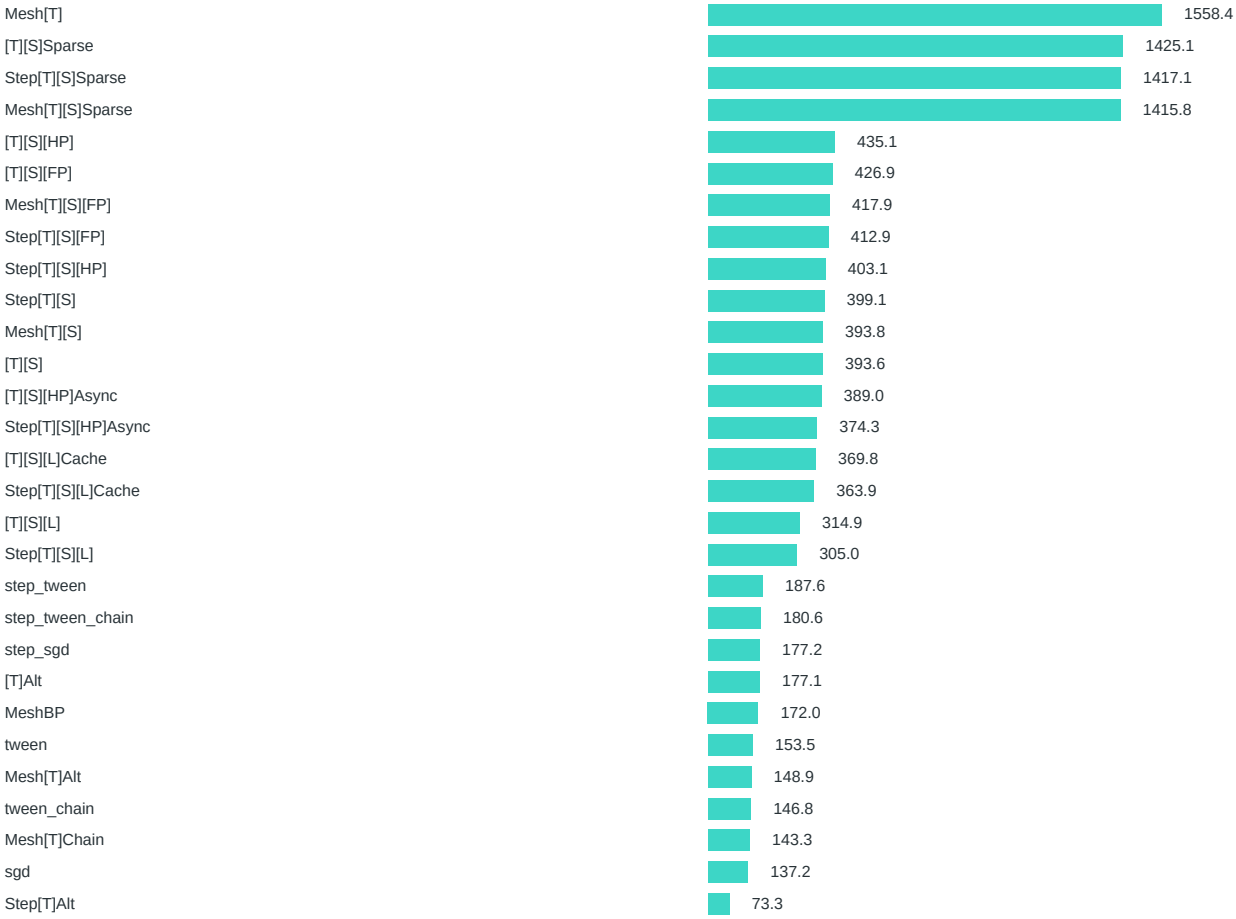
Best settings per mode



Best settings per mode



Mean Score by train mode



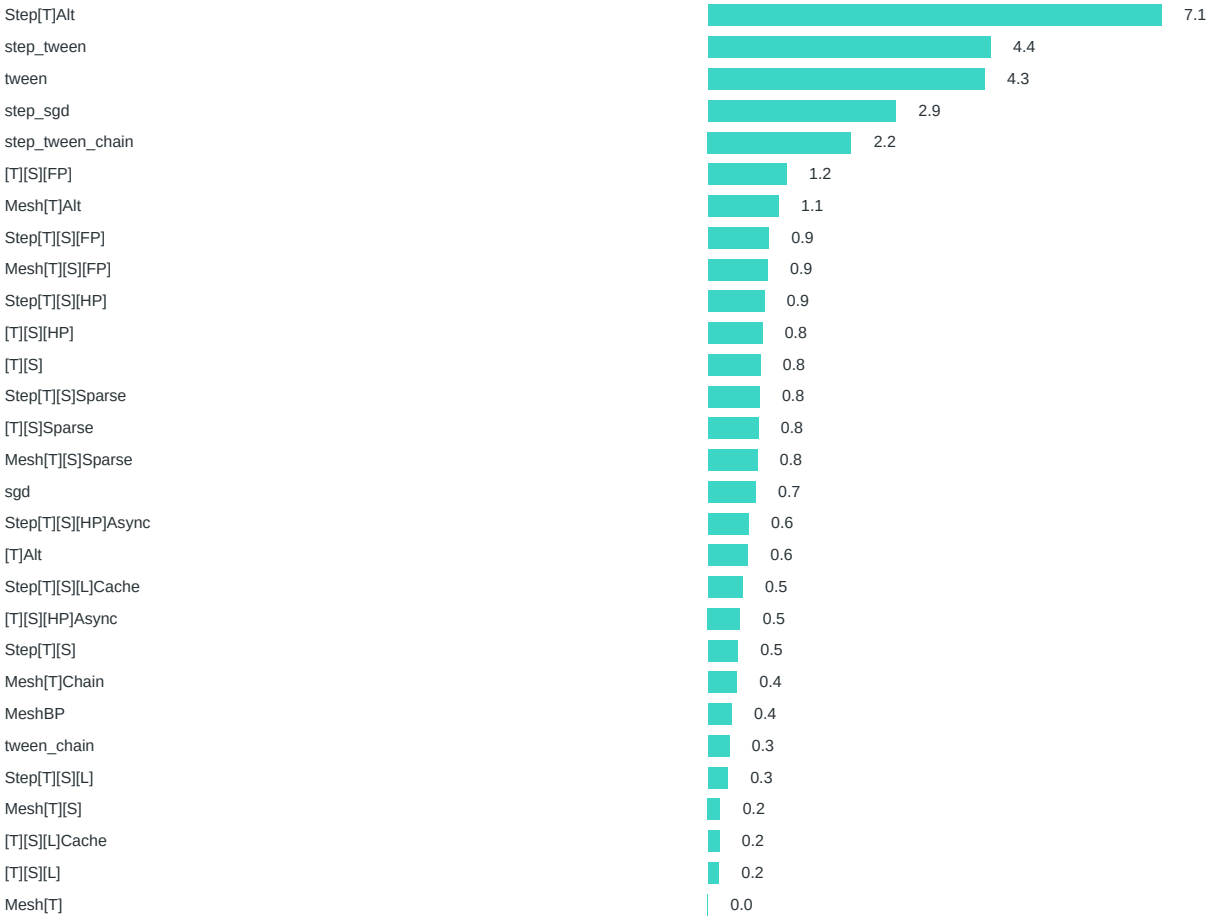
Mean hard Acc by train mode



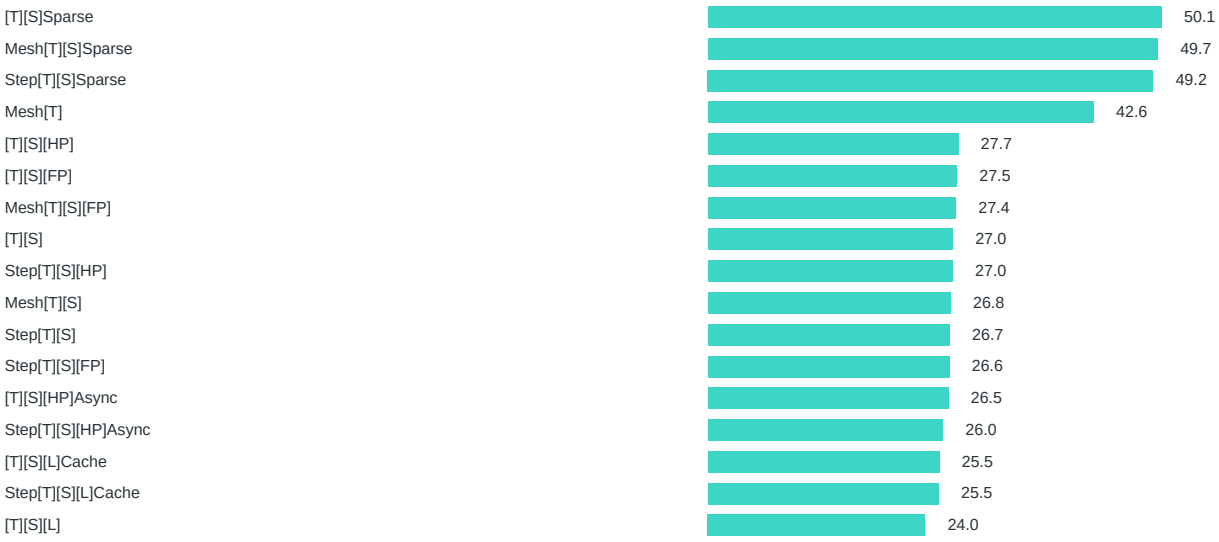
Mean hard Acc by train mode



Mean SoftAcc by train mode



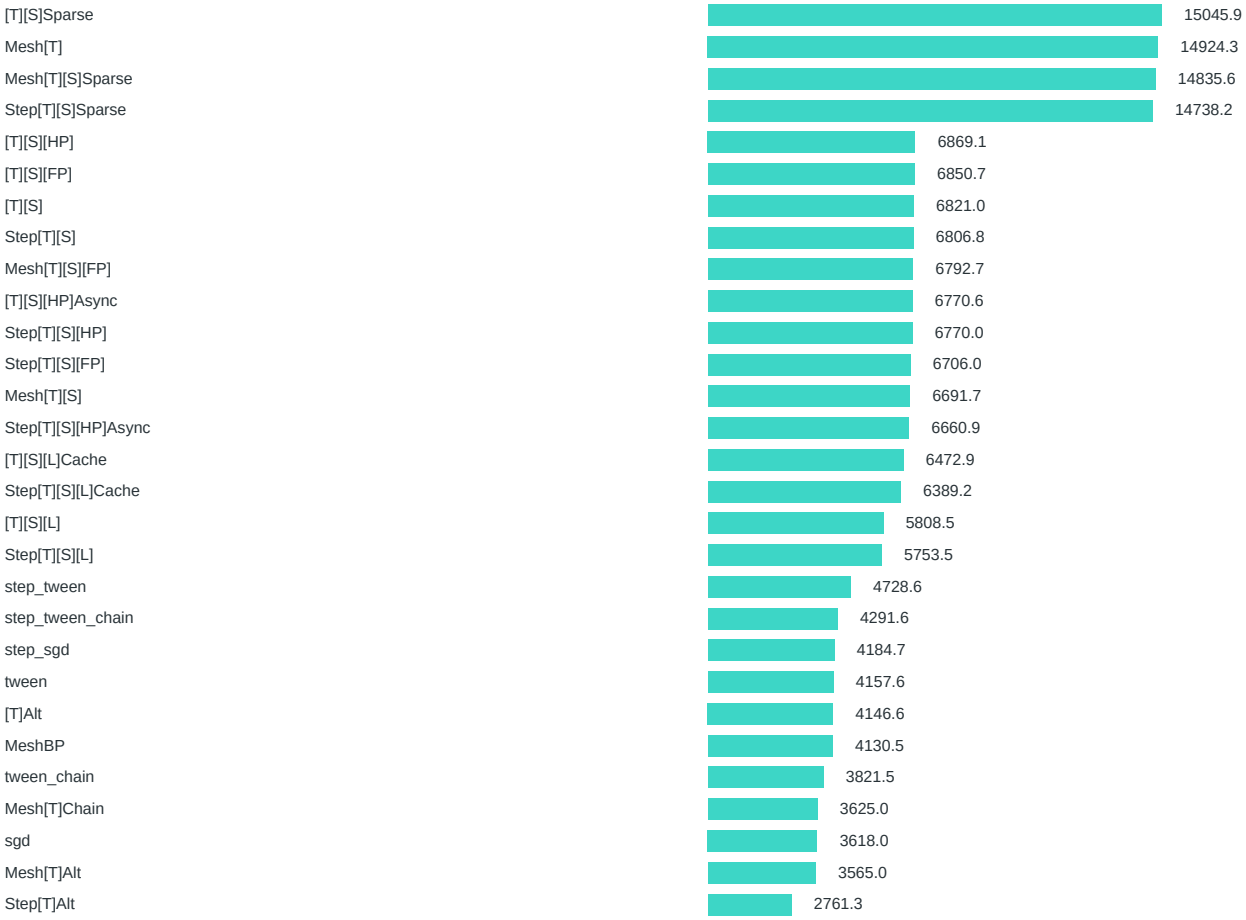
Mean Availability by train mode



Mean Availability by train mode



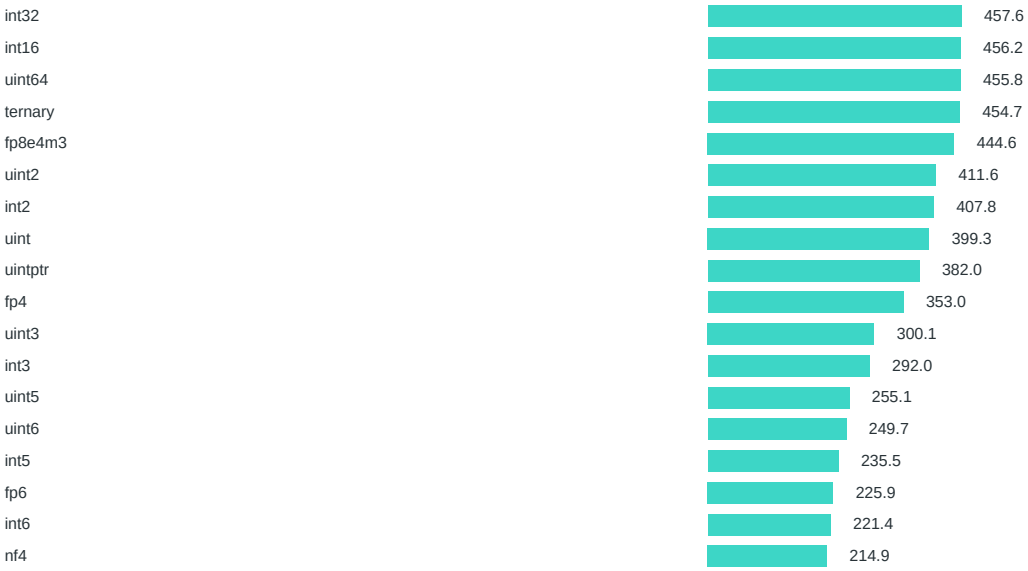
Mean Throughput by train mode



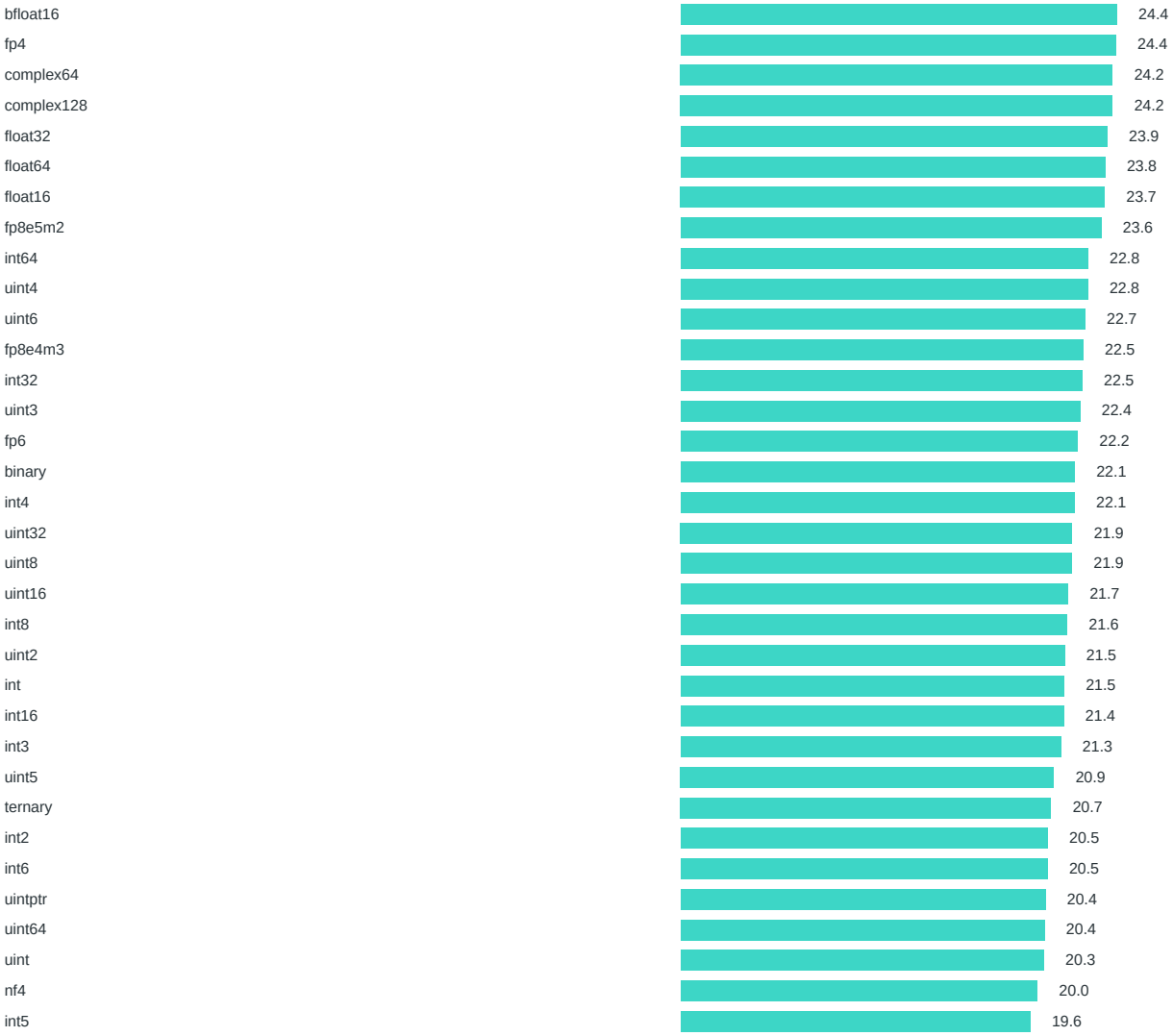
Mean Score by dtype



Mean Score by dtype



Mean hard Acc by dtype



Mean Score by arch



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

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

	bfloat16	binary	complex128	complex64	float16	float32	float64	fp4	fp6	fp8e4m3	fp8e5m2	int
MeshBP	206	267	235	201	196	253	278	139	83	139	202	222
Mesh[T]	1810	770	1485	1753	1658	2924	2547	1671	859	827	1738	1628
Mesh[T]Alt	442	89	371	347	377	846	777	37	37	43	454	61
Mesh[T]Chain	249	139	238	217	240	237	288	296	80	115	250	237
Mesh[T][S]	532	441	555	513	513	610	731	200	267	367	498	417
Mesh[T][S][FP]	522	601	538	506	544	763	711	266	217	391	577	430
Mesh[T][S]Sparse	2229	1468	1720	2036	1941	2641	2837	1423	666	1670	1963	2015
Step[T]Alt	97	96	129	102	75	90	94	75	29	82	42	66
Step[T][S]	543	477	536	495	560	414	595	238	212	350	498	350
Step[T][S][FP]	483	403	533	453	557	423	647	239	235	391	523	436
Step[T][S][HP]	568	501	483	546	568	453	673	265	230	510	503	501
Step[T][S][HP]Async	507	468	496	510	534	339	649	207	242	315	488	471
Step[T][S][L]	403	335	364	379	369	327	522	193	122	344	396	299
Step[T][S][L]Cache	331	491	367	351	403	375	580	238	168	395	392	496
Step[T][S]Sparse	2039	1456	1897	1795	1805	2049	3009	1060	682	1712	2074	1543
[T]Alt	466	35	395	459	423	1611	809	43	12	81	486	54
[T][S]	510	486	495	527	519	500	679	217	237	270	512	361
[T][S][FP]	517	439	491	621	549	369	688	244	253	424	549	491
[T][S][HP]	610	477	581	498	568	438	674	258	165	406	642	532
[T][S][HP]Async	583	444	467	471	495	393	635	299	230	454	479	356
[T][S][L]	409	324	436	435	451	330	493	221	128	290	370	293
[T][S][L]Cache	406	503	390	366	322	318	474	222	215	444	450	519
[T][S]Sparse	2112	1526	1970	2164	2086	2291	2935	1260	684	1912	2097	1263
sgd	159	154	164	174	186	190	201	122	63	124	166	104
step_sgd	232	160	187	208	198	238	271	165	130	187	201	219
step_tween	319	214	215	278	180	249	269	146	66	148	168	240
step_tween_chain	193	232	215	239	205	244	253	170	87	210	210	215
tween	200	215	186	108	169	282	209	172	83	149	112	173
tween_chain	172	110	161	185	169	179	237	150	71	142	163	167

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	179	191	107	203	173	112	106	205	176	86	183	112
Mesh[T]	1803	1829	1175	1885	1826	1048	794	1960	1924	287	1669	1644
Mesh[T]Alt	64	51	50	65	85	12	32	97	56	42	64	49
Mesh[T]Chain	112	80	60	159	112	55	47	270	147	76	100	109
Mesh[T][S]	403	409	391	362	310	264	149	401	433	261	477	358
Mesh[T][S][FP]	563	384	255	400	565	259	249	572	527	124	435	250
Mesh[T][S]Sparse	988	1416	807	885	1603	581	860	2242	1234	962	1267	1291
Step[T]Alt	114	48	39	108	61	37	37	105	89	23	89	74
Step[T][S]	408	434	398	281	241	177	264	682	449	214	529	495
Step[T][S][FP]	463	376	285	424	400	279	252	448	499	180	624	285
Step[T][S][HP]	618	296	249	366	531	205	158	343	247	179	525	428
Step[T][S][HP]Async	361	343	221	401	600	139	186	388	539	184	219	388
Step[T][S][L]	312	367	192	342	341	168	76	494	349	131	381	261
Step[T][S][L]Cache	468	420	226	412	402	135	210	576	452	236	482	314
Step[T][S]Sparse	1620	1154	906	1576	1259	810	663	2159	1855	639	1239	1315
[T]Alt	82	55	35	74	40	33	37	58	84	43	19	66
[T][S]	176	365	226	631	641	283	221	552	313	214	441	352
[T][S][FP]	366	379	349	493	581	326	206	588	435	162	475	374
[T][S][HP]	406	254	353	555	725	266	240	554	531	129	614	297
[T][S][HP]Async	490	279	265	517	481	144	219	557	493	197	352	299
[T][S][L]	292	343	180	375	400	173	159	310	358	166	397	295
[T][S][L]Cache	416	440	199	416	418	224	131	629	464	236	499	345
[T][S]Sparse	1274	979	896	1118	1352	647	676	1805	1704	988	1090	1292
sgd	226	185	51	213	145	44	62	211	183	65	114	116
step_sgd	221	180	102	194	255	78	72	211	170	101	141	166
step_tween	250	165	94	257	256	87	73	308	212	47	210	164
step_tween_chain	269	153	167	113	141	85	98	239	208	112	113	180
tween	175	107	67	221	166	77	75	196	179	75	199	153
tween_chain	110	144	124	226	217	80	72	180	224	74	155	110

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	188	208	129	107	177	107	114	170	224	172
Mesh[T]	1848	1657	1104	1764	1884	976	859	1737	1983	1662
Mesh[T]Alt	50	53	60	65	51	39	23	42	66	66
Mesh[T]Chain	94	114	63	126	106	66	79	106	118	90
Mesh[T][S]	439	406	399	309	468	150	212	373	340	434
Mesh[T][S][FP]	470	390	279	414	409	257	209	397	388	348
Mesh[T][S]Sparse	1616	790	1155	1330	1449	827	856	1318	1088	964
Step[T]Alt	96	51	34	97	83	35	28	96	100	66
Step[T][S]	323	475	363	399	479	266	275	377	468	305
Step[T][S][FP]	491	357	370	389	599	272	233	669	450	369
Step[T][S][HP]	446	305	262	461	523	204	315	323	581	342
Step[T][S][HP]Async	352	387	239	306	498	174	315	388	413	458
Step[T][S][L]	299	362	181	358	385	161	119	360	410	269
Step[T][S][L]Cache	393	428	205	446	340	205	160	474	436	366
Step[T][S]Sparse	1216	1344	906	1362	1352	953	855	1691	1178	1008
[T]Alt	68	31	24	78	56	44	26	69	84	42
[T][S]	561	227	296	429	581	200	245	264	459	390
[T][S][FP]	554	394	275	588	515	262	189	364	539	467
[T][S][HP]	554	486	200	642	513	253	215	289	467	402
[T][S][HP]Async	482	384	203	501	470	173	249	387	457	319
[T][S][L]	385	304	207	355	389	149	160	374	452	303
[T][S][L]Cache	461	360	268	423	400	230	196	425	519	244
[T][S]Sparse	942	1429	941	1213	1639	863	785	1414	2050	1058
sgd	145	172	87	159	97	82	88	131	135	148
step_sgd	230	201	113	187	246	119	104	184	232	122
step_tween	236	147	91	188	221	61	91	252	255	223
step_tween_chain	179	182	88	209	250	109	107	211	252	187
tween	169	128	70	224	194	76	70	166	249	121
tween_chain	166	165	90	178	156	87	66	168	162	131

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	31	25	25	25	24	25	24	21	22	24	27
Mesh[T]	25	24	25	25	25	25	24	25	25	25	25	25
Mesh[T]Alt	24	26	24	25	25	25	24	24	25	17	24	19
Mesh[T]Chain	25	25	25	24	24	19	25	25	22	24	25	25
Mesh[T][S]	24	24	25	24	25	24	24	24	31	22	24	22
Mesh[T][S][FP]	25	29	25	25	24	24	25	25	19	22	25	23
Mesh[T][S]Sparse	25	18	25	25	25	25	25	25	18	23	25	25
Step[T]Alt	24	24	25	24	16	19	18	25	22	24	11	17
Step[T][S]	25	23	25	24	25	25	24	24	22	22	25	18
Step[T][S][FP]	24	21	25	24	25	25	24	25	23	22	24	22
Step[T][S][HP]	24	22	25	25	25	25	24	24	24	30	24	23
Step[T][S][HP]Async	25	22	24	25	24	25	25	25	22	18	25	23
Step[T][S][L]	25	23	24	25	24	24	24	24	23	23	25	17
Step[T][S][L]Cache	24	23	25	25	25	25	24	24	21	23	25	24
Step[T][S]Sparse	25	18	25	24	24	25	25	25	18	22	25	22
[T]Alt	25	23	25	25	24	25	25	24	16	25	25	18
[T][S]	24	22	24	25	25	25	25	23	21	16	25	18
[T][S][FP]	24	20	25	24	24	25	25	25	26	24	25	24
[T][S][HP]	25	20	25	24	25	25	24	24	19	23	25	23
[T][S][HP]Async	25	20	25	25	25	25	25	25	22	24	24	16
[T][S][L]	25	19	24	25	25	25	24	24	23	22	24	21
[T][S][L]Cache	25	22	24	24	24	24	25	25	24	22	25	25
[T][S]Sparse	25	18	24	25	25	25	25	24	18	25	24	16
sgd	25	23	24	25	25	25	24	24	22	23	24	17
step_sgd	25	20	24	25	25	25	25	24	29	24	25	24
step_tween	24	21	19	24	17	19	16	25	22	19	18	23
step_tween_chain	24	22	24	25	24	24	23	25	23	23	24	22
tween	23	22	19	14	19	24	17	25	23	24	17	20
tween_chain	25	17	25	24	24	24	25	25	23	25	24	24

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	20	21	18	22	20	23	27	23	17	19	20	17
Mesh[T]	25	25	24	25	25	24	24	25	25	24	24	25
Mesh[T]Alt	23	25	31	21	30	10	19	24	25	22	29	21
Mesh[T]Chain	23	18	19	26	23	23	17	24	21	21	21	23
Mesh[T][S]	19	23	26	20	17	21	18	18	22	23	25	21
Mesh[T][S][FP]	24	21	18	20	29	23	24	25	25	13	21	18
Mesh[T][S]Sparse	11	17	17	11	21	15	18	24	14	23	17	18
Step[T]Alt	23	22	21	23	16	22	20	23	23	16	24	22
Step[T][S]	20	23	27	13	13	16	25	31	20	23	25	28
Step[T][S][FP]	22	22	24	26	19	19	23	23	24	19	29	15
Step[T][S][HP]	29	16	22	19	22	18	18	16	12	18	22	25
Step[T][S][HP]Async	19	22	18	22	31	14	16	16	30	21	11	24
Step[T][S][L]	22	23	24	22	22	23	11	24	22	19	24	22
Step[T][S][L]Cache	21	24	20	23	21	17	25	25	22	22	24	20
Step[T][S]Sparse	21	15	17	18	14	18	18	23	21	16	15	18
[T]Alt	27	24	21	32	16	19	25	22	20	22	10	23
[T][S]	9	19	15	31	29	23	17	22	18	23	20	20
[T][S][FP]	18	20	23	22	29	24	19	24	21	18	22	21
[T][S][HP]	17	15	22	26	30	23	24	22	23	14	26	14
[T][S][HP]Async	25	15	21	26	22	16	19	25	23	19	17	18
[T][S][L]	20	23	24	24	23	23	23	17	24	21	23	21
[T][S][L]Cache	23	23	18	23	24	23	15	25	22	23	22	20
[T][S]Sparse	14	13	17	14	14	14	17	21	18	23	15	18
sgd	31	23	13	28	20	15	20	25	23	20	15	22
step_sgd	24	23	18	22	28	18	21	23	24	20	17	21
step_tween	22	22	22	21	22	22	21	24	19	16	22	17
step_tween_chain	30	20	27	19	15	20	26	24	23	21	13	21
tween	23	20	20	23	22	23	22	22	20	20	23	21
tween_chain	19	19	29	30	25	18	21	23	29	20	22	16

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	23	29	24	14	23	23	24	20	23	22
Mesh[T]	25	25	24	25	25	24	24	24	25	25
Mesh[T]Alt	19	24	28	23	27	21	15	11	23	22
Mesh[T]Chain	17	24	22	24	21	23	25	22	23	16
Mesh[T][S]	24	24	29	17	23	12	19	21	16	23
Mesh[T][S][FP]	23	23	22	19	22	19	21	20	16	20
Mesh[T][S]Sparse	18	11	25	18	18	19	21	14	14	15
Step[T]Alt	22	22	22	23	21	21	22	21	22	22
Step[T][S]	17	24	25	22	23	23	25	18	22	17
Step[T][S][FP]	22	21	29	17	29	23	22	35	22	21
Step[T][S][HP]	24	19	22	22	23	20	31	15	25	20
Step[T][S][HP]Async	21	23	22	17	25	18	30	23	21	23
Step[T][S][L]	22	23	22	23	23	24	22	24	22	21
Step[T][S][L]Cache	20	24	21	22	16	21	20	22	23	22
Step[T][S]Sparse	14	18	18	18	18	25	22	21	14	15
[T]Alt	28	14	17	24	26	25	18	23	26	15
[T][S]	26	13	23	20	26	17	24	12	23	24
[T][S][FP]	23	23	21	30	25	19	18	16	22	25
[T][S][HP]	27	24	20	29	23	21	22	13	22	22
[T][S][HP]Async	23	22	16	26	26	15	24	20	22	20
[T][S][L]	23	22	25	23	25	20	22	23	23	23
[T][S][L]Cache	24	21	24	23	19	23	22	24	23	17
[T][S]Sparse	11	17	21	15	21	21	21	18	24	15
sgd	22	24	23	26	14	20	27	21	21	23
step_sgd	26	22	22	22	28	23	23	22	27	20
step_tween	23	23	22	20	21	17	23	23	20	23
step_tween_chain	22	21	17	28	27	23	29	23	25	23
tween	19	22	21	23	22	21	22	21	24	14
tween_chain	24	23	23	23	21	24	20	24	23	23

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	0	0	0	0	0		0		0	0	0	0
Mesh[T]	0	0	0	0	0	0	0		0	0		0
Mesh[T]Alt	0	0	0	0	0	0	0	0	1	0	0	0
Mesh[T]Chain	0	0	0	0	0	0	0		0	0	0	0
Mesh[T][S]	0	0	0	0	0	0	0	0	0	0	0	0
Mesh[T][S][FP]	0	1	0	0	0	0	0		1		0	0
Mesh[T][S]Sparse	0	1	0	0	0	0	0		2	0	0	0
Step[T]Alt	0	1	0	0	0	0	0		20	0	0	0
Step[T][S]	0	0	0	0	0	0	0	0	6	0	0	0
Step[T][S][FP]	0	1	0	0	0	0	0		2	0	0	0
Step[T][S][HP]	0	1	0	0	0	0	0		1	0	0	0
Step[T][S][HP]Async	0	0	0	0		0	0		3		0	0
Step[T][S][L]	0	0	0	0	0	0	0		0	0	0	0
Step[T][S][L]Cache	0	0	0	0	0	0	0		0	0	0	0
Step[T][S]Sparse		1	0	0	0	0	0		1	0		0
[T]Alt	0	0	0	0	0		0	0	0	0	0	0
[T][S]	0	0	0	0	0	0	0	0	0	0	0	0
[T][S][FP]	0	1	0	0	0	0			1	0	0	0
[T][S][HP]	0	1	0	0	0	0	0		0	0	0	
[T][S][HP]Async	0	0	0	0	0	0	0		0	0	0	0
[T][S][L]	0	0	0	0	0	0	0		0	0	0	0
[T][S][L]Cache	0	0	0	0	0	0	0		0	0		
[T][S]Sparse	0	1	0	0	0	0	0		2	0		0
sgd		0	0	0	0	0	0		3		0	0
step_sgd	0	2	0	0	0	0	0		11	0	0	0
step_tween	0	0	0	0	0	0	0		12	0	0	0
step_tween_chain	0	1	0	0	0	0	0		4	0	0	0
tween	0	1	0	0	0	0	0		11	0	0	0
tween_chain	0	0		0	0	0	0		0	0	0	0

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	0	2	1	0	2	0	1	0	0	2	0	0
Mesh[T]	0	0	0	0	0	0	0	0		0	0	
Mesh[T]Alt	0	0	0	6	5	0	0	0	0	5	0	0
Mesh[T]Chain	0	2	2	0	0	1	0	0	0	2	0	0
Mesh[T][S]	0	0	0	0	0	0	0	0	0	5	0	0
Mesh[T][S][FP]	1	3	1	2	1	1	1	0	1	3	1	1
Mesh[T][S]Sparse	1	1	1	1	1	1	1	0	1	4	1	1
Step[T]Alt	6	7	11	7	7	14	22	0	8	17	6	9
Step[T][S]	4	0	0	1	0	0	0	0	0	4	0	0
Step[T][S][FP]	1	3	1	1	1	1	1	0	1	2	3	2
Step[T][S][HP]	1	1	1	0	2	1	1	0	2	3	1	2
Step[T][S][HP]Async	0	1	0	0	0	0	0	0	8	4	0	3
Step[T][S][L]	0	0	0	0	0	0	0	0	0	10	0	0
Step[T][S][L]Cache	0	0	0	0	0	0	0	0	0	18	0	0
Step[T][S]Sparse	1	1	1	1	1	1	2	0	1	4	1	1
[T]Alt	0	0	0	5	0	0	0	0	0	5	0	0
[T][S]	0	0	0	3	0	5	0	0	0	5	0	0
[T][S][FP]	1	2	2	0	1	1	4	0	1	3	1	3
[T][S][HP]	1	3	2	0	1	1	1	0	3	3	4	1
[T][S][HP]Async	0	1	1	0	0	2	0	0	1	3	0	0
[T][S][L]	0	0	0	0	0	0	0	0	0	6	0	0
[T][S][L]Cache	0	0	0	0	0		0	0	0	6	0	0
[T][S]Sparse	1	0	1	1	0	1	1	0	1	4	1	1
sgd	1	0	1	0	1	5	0	0	1	1	0	1
step_sgd	3	3	5	4	5	6	5	0	5	4	4	3
step_tween	5	3	10	4	5	11	12	0	4	8	3	6
step_tween_chain	3	4	4	0	6	9	7	0	3	3	1	1
tween	4	4	8	4	4	9	11		5	9	3	6
tween_chain	0	0	1	0	0	0	0	0	0	1	0	1

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	1	1	1	0	0	0	0	0	0	0
Mesh[T]	0	0	0	0	0	0	0	0	0	0
Mesh[T]Alt	0	0	0	0	0	0	0	20	0	0
Mesh[T]Chain	0	0	0	0	1	1	0	0	3	1
Mesh[T][S]	0	0	0	0	0	0	0	0	2	0
Mesh[T][S][FP]	3	1	2	1	1	1	1	2	1	1
Mesh[T][S]Sparse	1	1	1	1	1	2	1	1	1	1
Step[T]Alt	8	7	18	9	8	14	16	8	7	9
Step[T][S]	0	0	0	0	0	0	0	0	0	0
Step[T][S][FP]	1	1	1	2	1	3	1	1	1	1
Step[T][S][HP]	3	1	0	1	1	4	1	1	2	1
Step[T][S][HP]Async	0	0	1	1	0	0	0	0	0	0
Step[T][S][L]	0		0	0	0	0	0	0	0	0
Step[T][S][L]Cache	0	0	0	0	0	0	0	0	0	0
Step[T][S]Sparse	1	1	1	1	1	2	2	1	1	1
[T]Alt	11	0	0	0	0	0	0	0	0	0
[T][S]	0	0	0	6	9	0	0	0	0	0
[T][S][FP]	1	4	1	2	3	1	4	1	2	1
[T][S][HP]	1	1	1	1	1	1	1	1	1	1
[T][S][HP]Async	0	0	0	5	3	0	0	1	1	0
[T][S][L]	0	0	0	0	0	0	0	0	0	0
[T][S][L]Cache		0	0	0	0	0	0	0	0	0
[T][S]Sparse	1	1	2	1	1	2	1	1	1	1
sgd	1	1	0	0	1	1	2	1	2	1
step_sgd	0	4	4	4	6	3	10	2	3	3
step_tween	4	6	10	5	4	11	12	4	5	6
step_tween_chain	3	3	2	1	6	2	4	3	3	2
tween	5	7	7	4	5	11	12	5	4	7
tween_chain	0	1	0	0	0	0	4	0	0	0

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	18	19	23	19	18	13	16	15	20	16	19	20
Mesh[T]	41	31	43	50	42	36	36	37	48	33	47	49
Mesh[T]Alt	25	13	25	21	22	23	24	8	11	9	27	13
Mesh[T]Chain	19	16	21	20	21	16	16	21	23	15	21	20
Mesh[T][S]	27	25	32	29	28	23	24	17	23	26	28	28
Mesh[T][S][FP]	26	25	31	28	29	27	24	21	32	27	32	27
Mesh[T][S]Sparse	52	52	47	56	46	40	42	43	52	48	50	56
Step[T]Alt	12	13	16	13	14	8	10	13	12	13	15	14
Step[T][S]	28	27	30	28	29	13	22	20	27	24	28	31
Step[T][S][FP]	26	25	31	27	29	14	23	18	30	27	30	30
Step[T][S][HP]	29	29	28	30	29	14	23	21	26	26	29	33
Step[T][S][HP]Async	26	28	31	30	28	11	23	16	32	26	27	32
Step[T][S][L]	26	22	25	25	24	12	21	16	20	25	26	29
Step[T][S][L]Cache	21	28	26	23	26	14	24	18	27	25	26	29
Step[T][S]Sparse	51	50	55	51	47	25	47	35	54	51	52	51
[T]Alt	23	10	26	28	26	21	24	9	9	11	29	12
[T][S]	26	28	29	28	26	15	23	19	31	24	28	30
[T][S][FP]	27	28	29	36	28	11	23	18	27	26	31	30
[T][S][HP]	30	30	33	28	30	14	24	21	26	27	34	34
[T][S][HP]Async	29	28	28	25	26	13	21	23	28	27	28	34
[T][S][L]	25	25	30	29	28	12	20	18	21	22	24	24
[T][S][L]Cache	24	29	26	25	21	12	19	18	27	29	29	29
[T][S]Sparse	51	52	54	58	52	27	44	40	55	52	56	56
sgd	16	17	19	19	19	9	13	14	17	15	19	18
step_sgd	20	17	19	20	17	10	16	17	22	19	18	23
step_tween	22	18	23	22	19	11	18	14	16	19	18	22
step_tween_chain	17	19	19	21	21	10	15	17	18	19	20	20
tween	18	19	19	21	22	11	17	18	21	15	16	20
tween_chain	17	15	17	20	17	8	15	16	16	15	17	20

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	18	20	21	20	18	18	16	18	21	14	20	19
Mesh[T]	41	42	47	42	43	49	42	46	41	22	41	48
Mesh[T]Alt	11	9	12	12	10	11	10	13	9	12	9	11
Mesh[T]Chain	14	14	13	19	14	12	16	20	20	14	15	16
Mesh[T][S]	27	25	32	25	24	29	24	22	28	26	27	26
Mesh[T][S][FP]	30	26	29	26	24	28	26	29	27	22	28	25
Mesh[T][S]Sparse	51	53	53	50	46	51	55	52	51	40	49	52
Step[T]Alt	15	9	12	14	13	12	16	13	12	9	12	13
Step[T][S]	28	26	29	28	25	27	28	27	29	20	27	27
Step[T][S][FP]	27	25	26	25	27	31	31	24	27	20	29	25
Step[T][S][HP]	27	29	26	26	31	26	27	26	28	22	31	27
Step[T][S][HP]Async	27	23	26	25	26	24	28	28	26	19	26	27
Step[T][S][L]	20	24	22	24	24	24	25	29	24	18	26	23
Step[T][S][L]Cache	30	25	28	24	24	26	25	27	26	24	28	25
Step[T][S]Sparse	47	51	51	53	53	52	49	53	51	34	53	52
[T]Alt	10	9	10	9	9	12	12	8	14	12	11	12
[T][S]	27	25	31	28	27	29	30	29	25	20	29	29
[T][S][FP]	26	25	31	29	27	34	27	29	27	21	28	27
[T][S][HP]	27	27	31	28	30	28	27	28	29	20	31	26
[T][S][HP]Async	26	28	27	26	27	26	30	27	27	21	28	25
[T][S][L]	21	24	21	25	25	23	24	26	23	18	26	26
[T][S][L]Cache	23	27	27	25	23	26	26	27	27	23	30	27
[T][S]Sparse	52	47	53	52	55	51	51	51	54	39	51	50
sgd	16	20	15	18	18	14	16	20	19	12	19	16
step_sgd	20	19	19	19	20	17	16	18	15	15	19	20
step_tween	20	19	17	22	20	17	17	21	19	10	18	21
step_tween_chain	17	17	20	16	17	17	17	21	19	16	18	19
tween	15	14	15	21	16	15	18	17	19	13	20	18
tween_chain	14	19	16	19	19	18	16	17	18	11	17	19

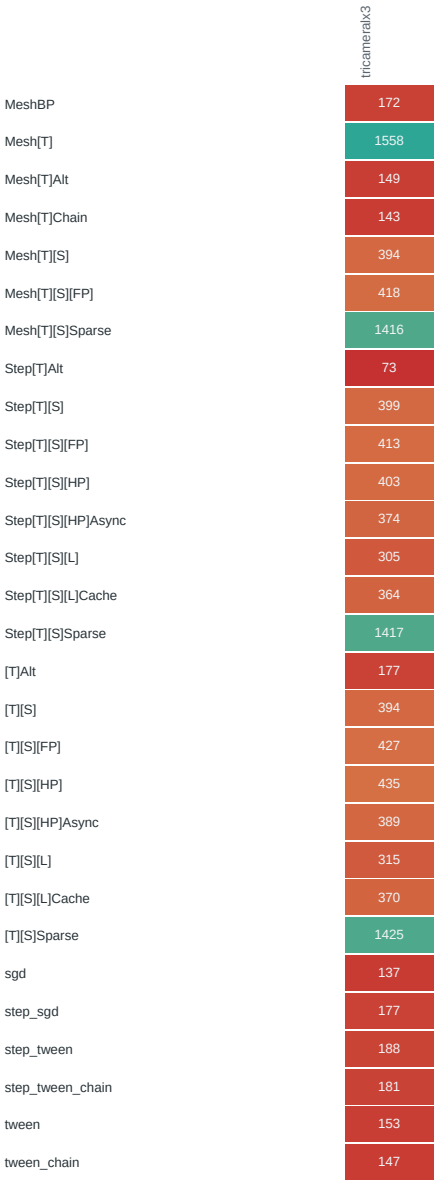
Honesty - mean Avail, every mode x dtype (cols 25-34)

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

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	17	17	20	18	18	22	23	18	20	22
Mesh[T]	44	43	47	42	46	47	47	42	45	48
Mesh[T]Alt	10	9	15	11	8	15	12	14	11	14
Mesh[T]Chain	15	15	15	16	15	16	19	14	15	17
Mesh[T][S]	24	25	34	25	27	30	31	25	32	30
Mesh[T][S][FP]	27	24	31	29	25	33	30	25	32	27
Mesh[T][S]Sparse	50	47	50	50	54	53	51	54	46	48
Step[T]Alt	13	10	11	14	13	13	10	15	13	11
Step[T][S]	27	26	31	26	28	28	30	28	27	28
Step[T][S][FP]	29	26	28	28	27	29	31	25	27	29
Step[T][S][HP]	24	24	29	30	31	25	30	28	29	26
Step[T][S][HP]Async	23	25	28	27	29	28	28	24	27	33
Step[T][S][L]	20	26	25	26	28	22	19	22	29	24
Step[T][S][L]Cache	26	25	24	28	29	30	24	29	24	27
Step[T][S]Sparse	51	51	53	48	52	49	50	48	50	51
[T]Alt	9	10	9	13	8	13	12	11	11	13
[T][S]	28	27	29	28	29	32	28	26	27	26
[T][S][FP]	32	24	31	27	28	33	29	27	32	28
[T][S][HP]	26	30	24	28	30	29	27	27	27	28
[T][S][HP]Async	28	25	32	28	25	25	31	26	28	26
[T][S][L]	26	22	25	26	27	24	26	24	30	26
[T][S][L]Cache	25	25	29	26	31	30	27	23	29	26
[T][S]Sparse	53	49	48	53	49	50	48	51	49	52
sgd	16	19	17	16	19	22	18	16	17	20
step_sgd	19	21	19	20	19	23	21	19	18	16
step_tween	18	16	18	17	20	14	20	20	23	21
step_tween_chain	19	19	17	19	19	22	20	20	19	19
tween	18	16	16	21	20	18	15	17	23	21
tween_chain	16	18	17	19	18	17	16	16	17	17

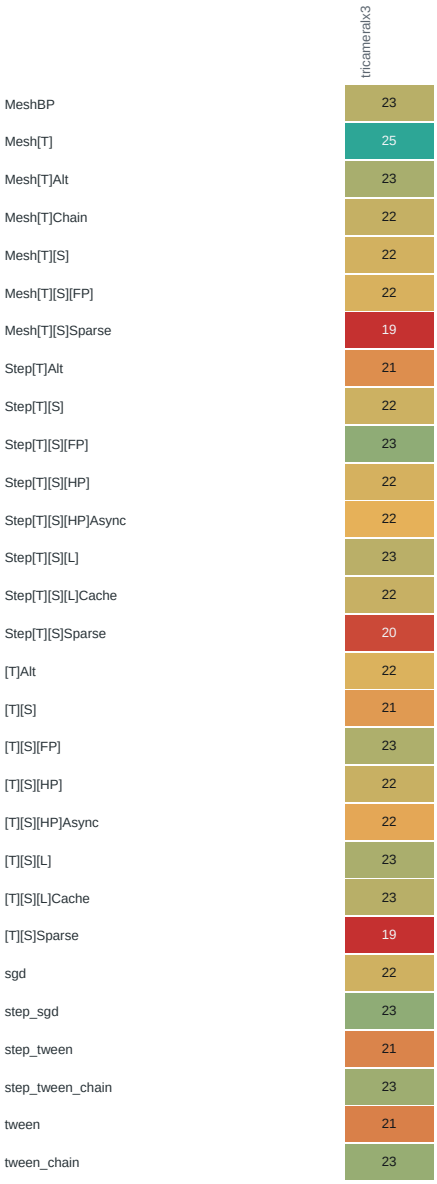
Mean Score, every mode x arch

Mean Score, every mode x arch



Mean hard Acc, every mode x arch

Mean hard Acc, every mode x arch

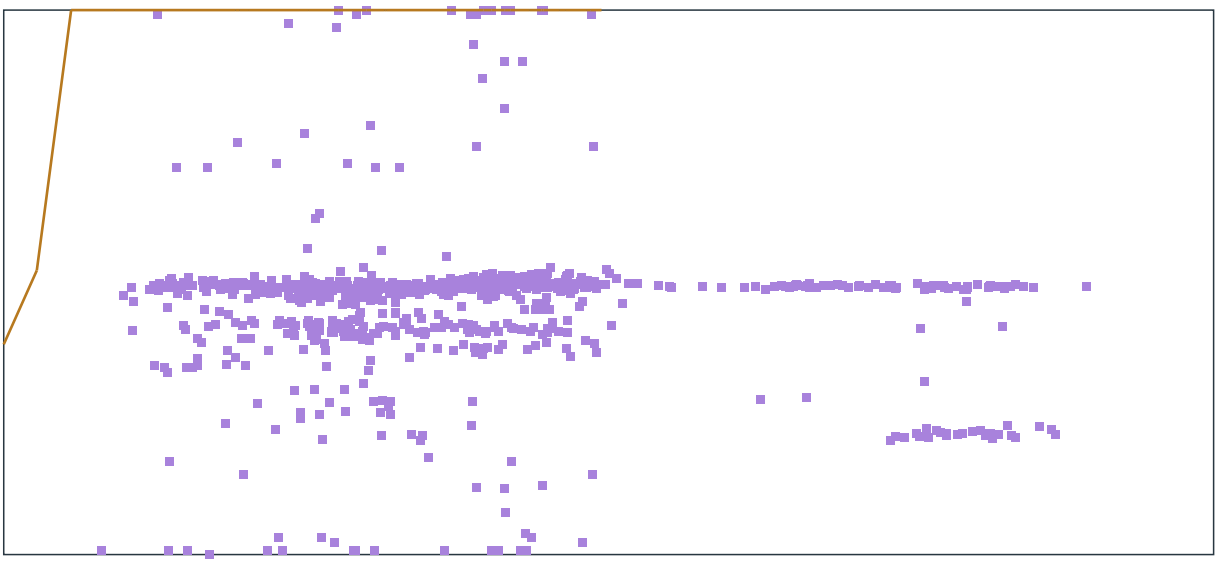


Mean Avail, every mode x arch

Mean Avail, every mode x arch

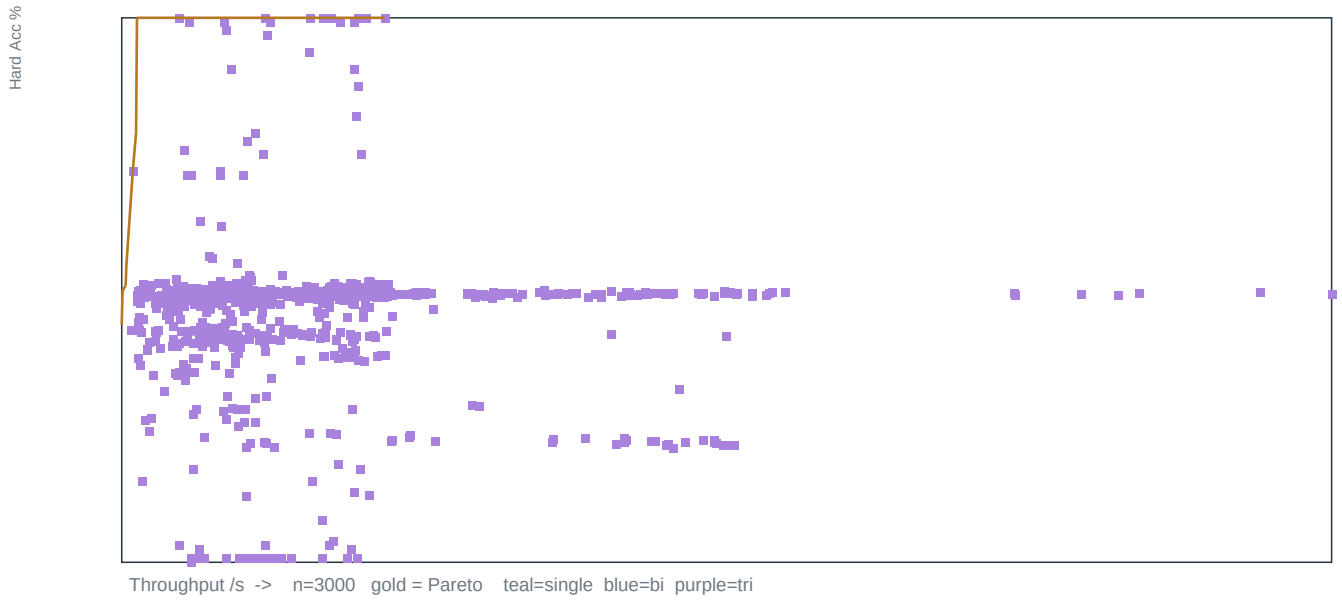
	tricamerarix3
MeshBP	19
Mesh[T]	43
Mesh[T]Alt	14
Mesh[T]Chain	17
Mesh[T][S]	27
Mesh[T][S][FP]	27
Mesh[T][S]Sparse	50
Step[T]Alt	13
Step[T][S]	27
Step[T][S][FP]	27
Step[T][S][HP]	27
Step[T][S][HP]Async	26
Step[T][S][L]	23
Step[T][S][L]Cache	25
Step[T][S]Sparse	49
[T]Alt	14
[T][S]	27
[T][S][FP]	27
[T][S][HP]	28
[T][S][HP]Async	27
[T][S][L]	24
[T][S][L]Cache	26
[T][S]Sparse	50
sgd	17
step_sgd	19
step_tween	19
step_tween_chain	18
tween	18
tween_chain	17

Pillars - Availability vs hard Acc

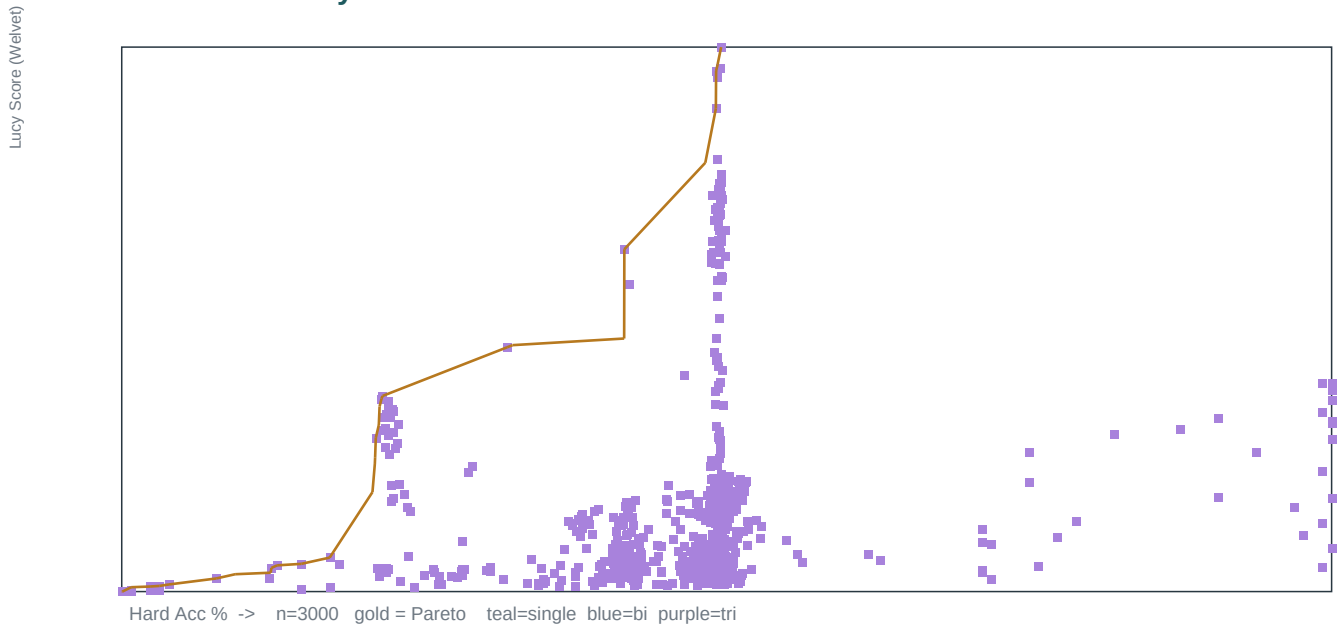



Availability % -> n=3000 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

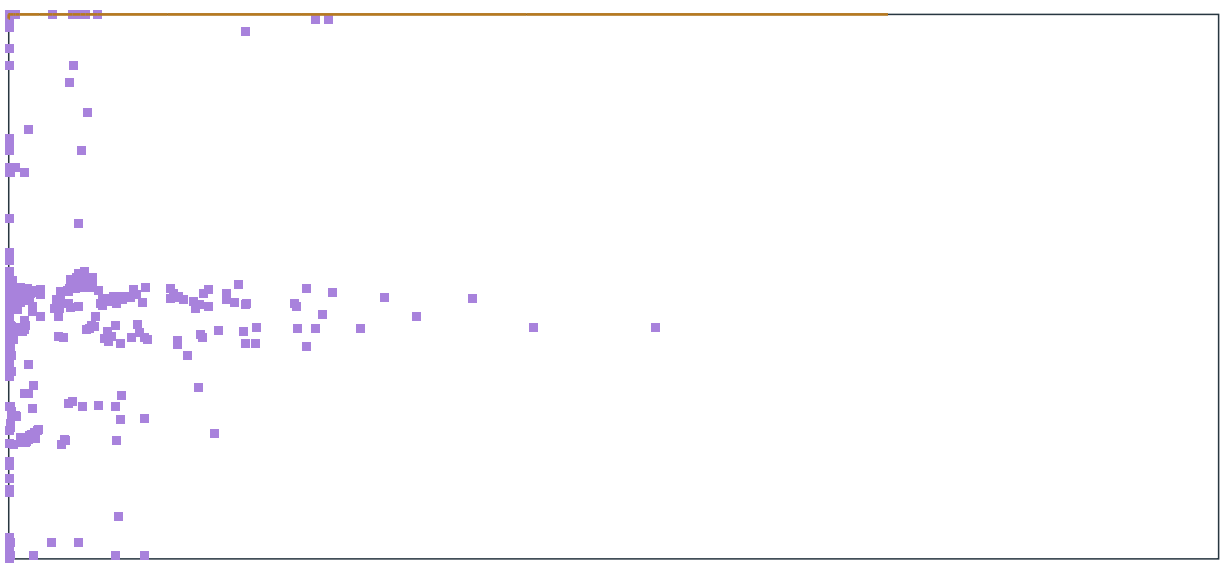
Pillars - Throughput vs hard Acc



Pareto - hard Acc vs Lucy Score

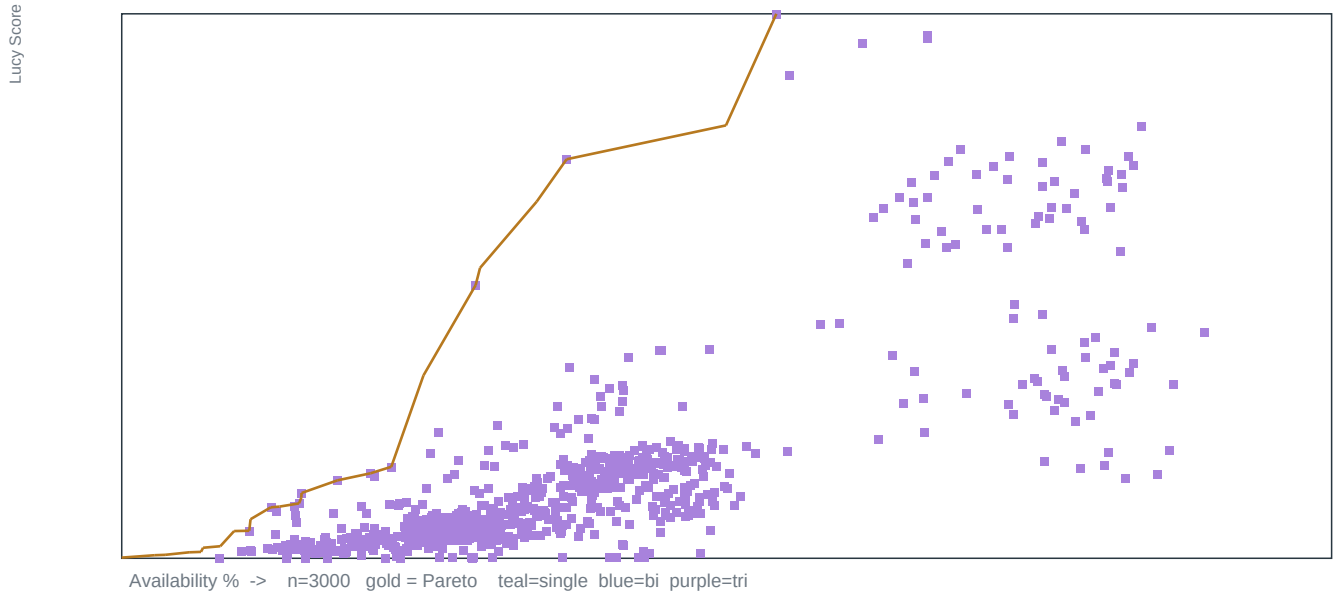


SoftAcc (serve-confidence) vs hard Acc

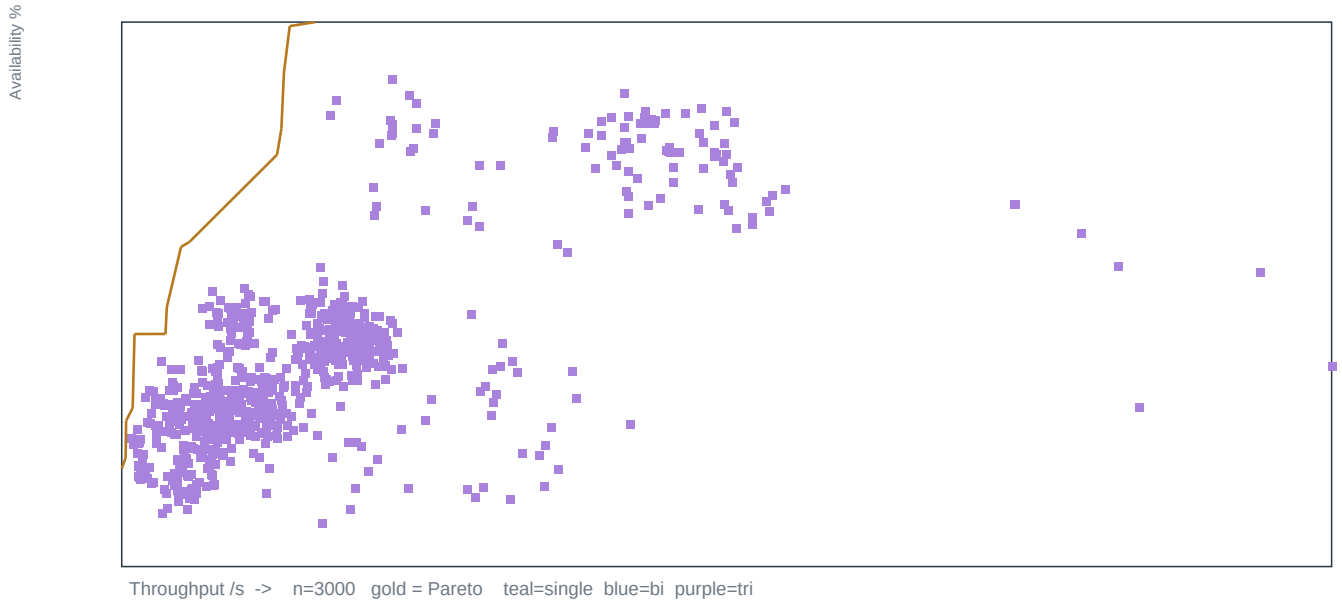



SoftAcc % -> n=3000 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

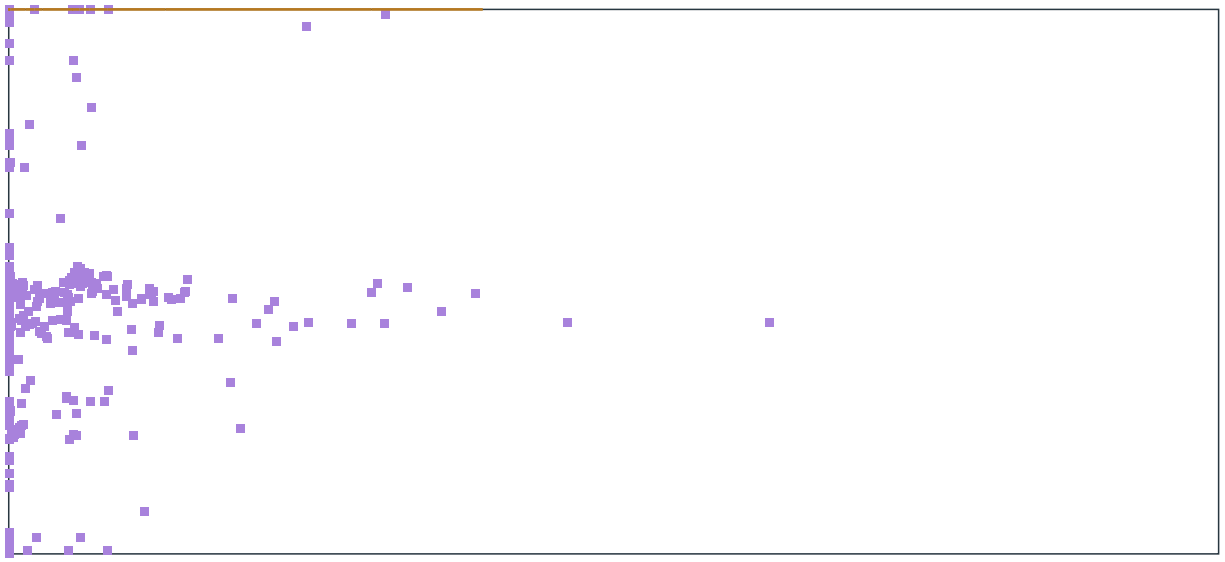
Avail vs Lucy Score (duty clock)



Pillars - Throughput vs Availability



AdaptPct vs hard Acc



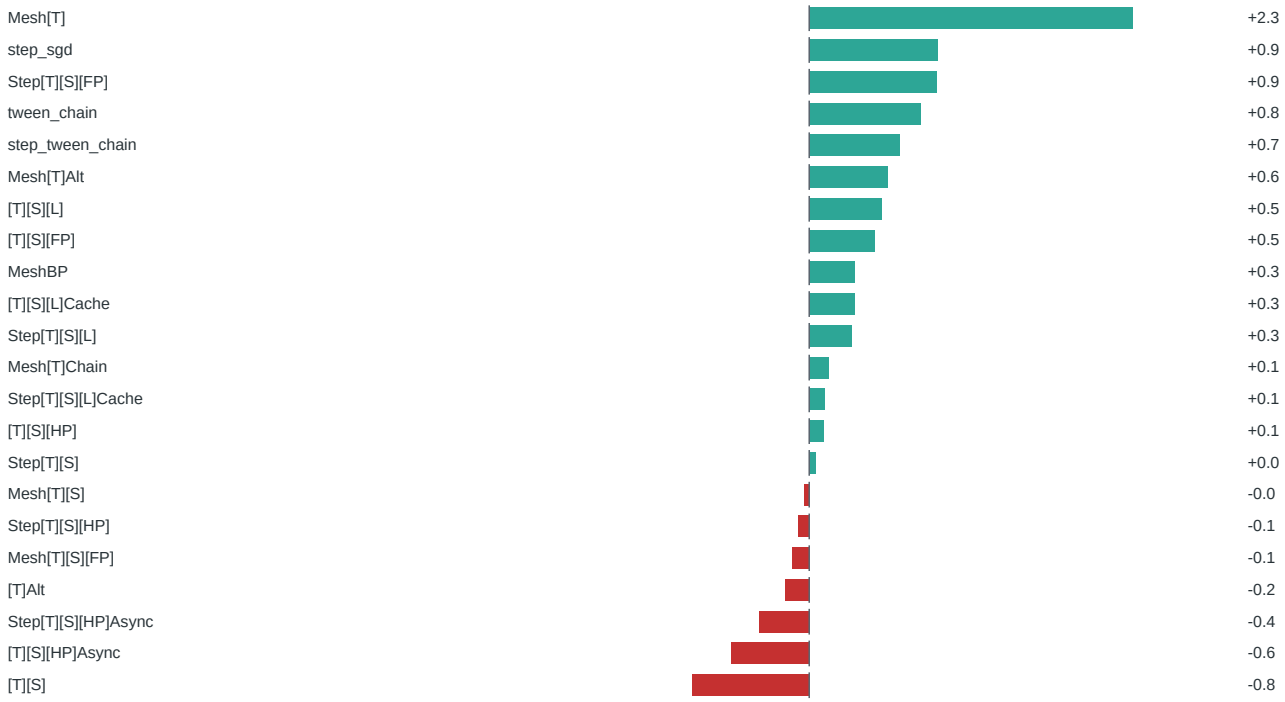

AdaptPct % -> n=3000 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

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%
Mesh[T]	136	+2.3	65	-0.7	+25.5	+11306	+1421.2	100
step_sgd	136	+0.9	43	+2.2	+1.4	+567	+40.0	74
Step[T][S][FP]	136	+0.9	43	+0.2	+9.5	+3088	+275.6	96
tween_chain	136	+0.8	43	-0.4	-0.4	+203	+9.6	54
step_tween_chain	135	+0.7	42	+1.5	+1.2	+675	+43.2	74
Mesh[T]Alt	136	+0.6	40	+0.4	-3.4	-53	+11.7	26
[T][S][L]	136	+0.5	47	-0.6	+6.9	+2191	+177.7	99
[T][S][FP]	136	+0.5	42	+0.5	+10.4	+3233	+289.7	99
MeshBP	136	+0.3	41	-0.4	+1.5	+513	+34.8	73
[T][S][L]Cache	136	+0.3	43	-0.6	+8.4	+2855	+232.6	97
Step[T][S][L]	136	+0.3	43	-0.4	+6.2	+2136	+167.8	95
Mesh[T]Chain	136	+0.1	48	-0.3	-0.3	+7	+6.1	48
Step[T][S][L]Cache	136	+0.1	39	-0.2	+8.4	+2771	+226.7	97
[T][S][HP]	136	+0.1	42	+0.1	+10.5	+3251	+297.8	95
Step[T][S]	136	+0.0	43	-0.3	+9.6	+3189	+261.9	92
Mesh[T][S]	136	-0.0	43	-0.6	+9.7	+3074	+256.6	93
Step[T][S][HP]	136	-0.1	44	+0.1	+9.9	+3152	+265.9	96
Mesh[T][S][FP]	136	-0.1	36	+0.2	+10.3	+3175	+280.7	97
[T]Alt	136	-0.2	43	-0.1	-3.5	+529	+39.9	24
Step[T][S][HP]Async	136	-0.4	36	-0.1	+8.8	+3043	+237.1	93
[T][S][HP]Async	136	-0.6	38	-0.2	+9.4	+3153	+251.8	96
[T][S]	136	-0.8	46	+0.1	+9.9	+3203	+256.3	90
Step[T]Alt	136	-1.1	35	+6.3	-4.6	-857	-64.0	4
step_tween	136	-1.3	43	+3.7	+1.5	+1111	+50.4	71
tween	136	-1.4	37	+3.6	+0.6	+540	+16.3	62
Step[T][S]Sparse	136	-2.5	35	+0.1	+32.1	+11120	+1279.8	99
Mesh[T][S]Sparse	136	-2.9	35	+0.0	+32.6	+11218	+1278.6	100
[T][S]Sparse	136	-3.0	34	+0.0	+33.0	+11428	+1287.9	99

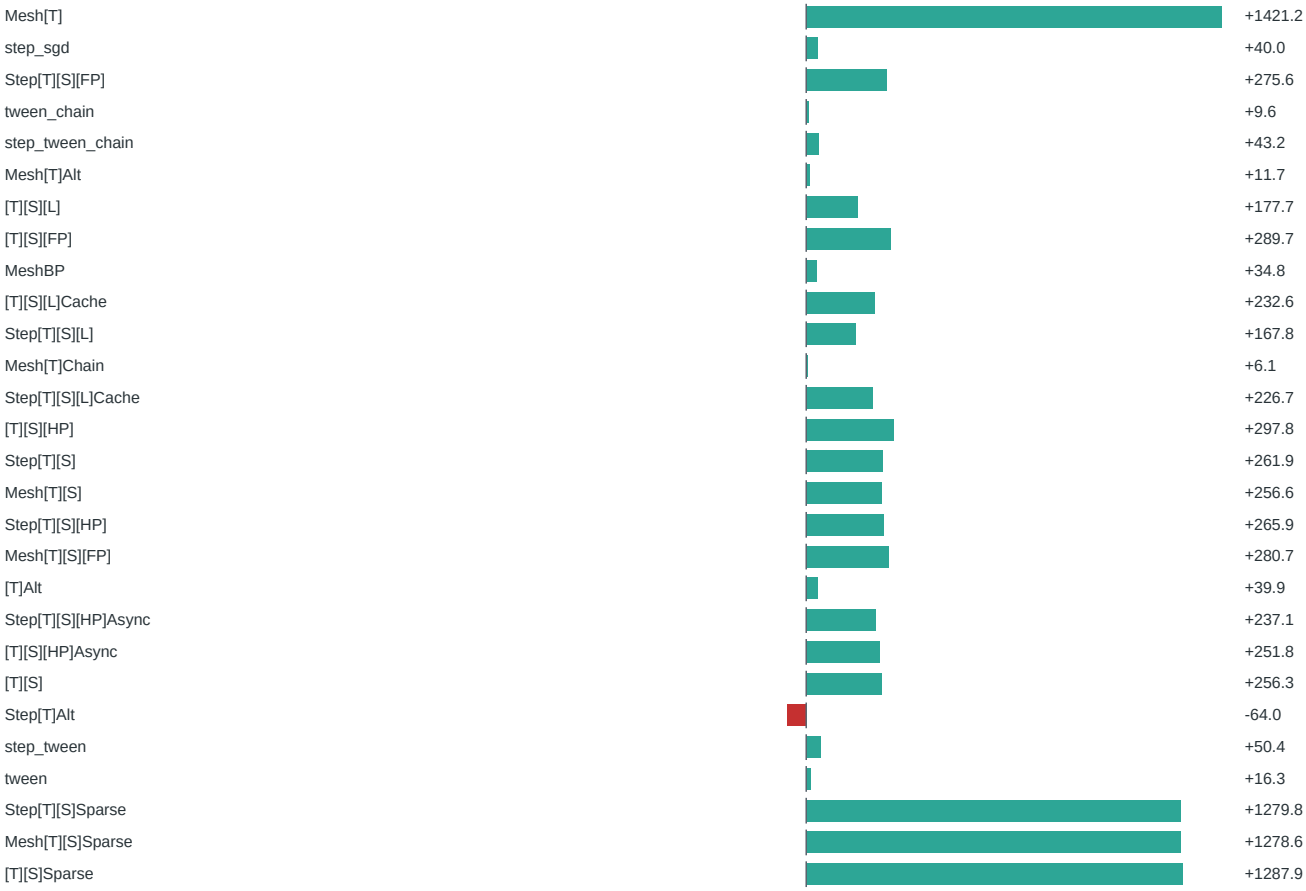
mean AccD vs sgd



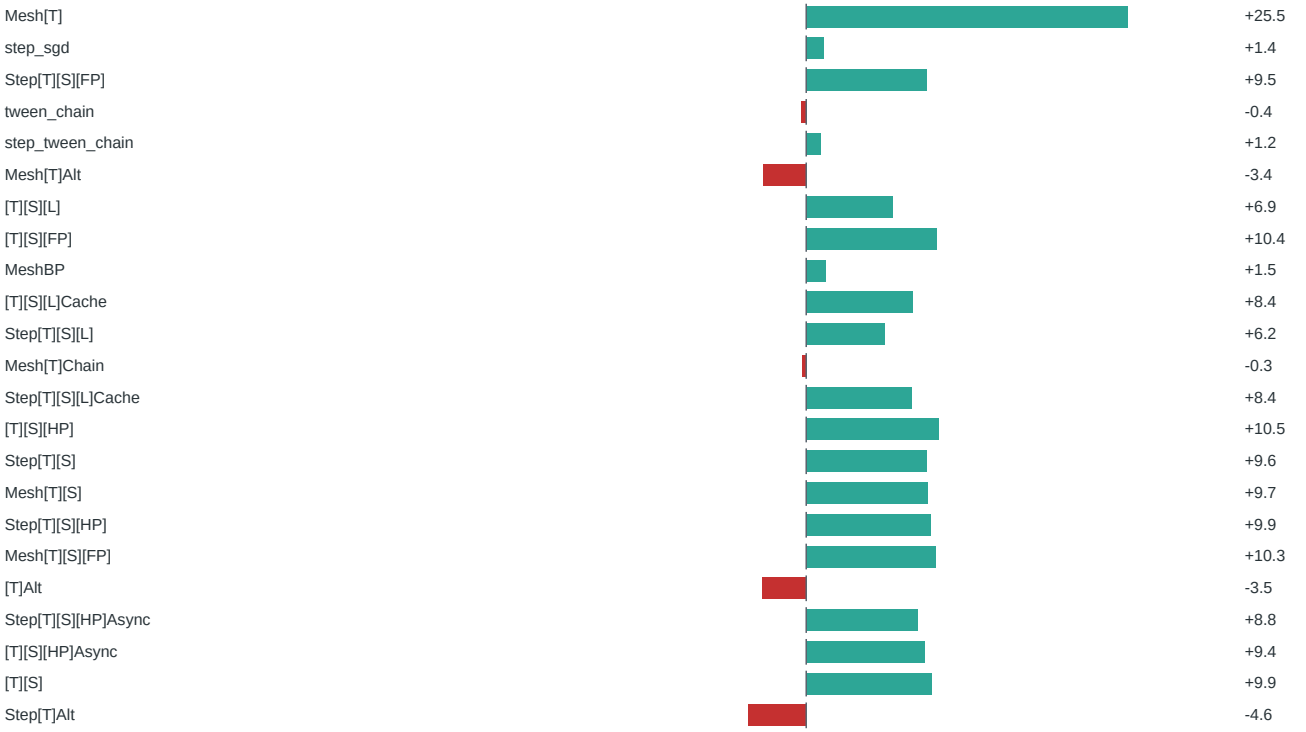
mean AccD vs sgd



mean ScoreD vs sgd (duty clock)



mean AvailD vs sgd



mean AvailD vs sgd



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

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

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	-11	-2	+5	-6	+0	+8	+7	-2	-6	-0	+5	-5
Mesh[T]	-6	+1	+11	-3	+5	+9	+4	-0	+1	+5	+9	+3
Mesh[T]Alt	-8	+2	+18	-7	+10	-5	-1	-0	+1	+3	+14	-1
Mesh[T]Chain	-7	-6	+6	-2	+3	+8	-3	-0	-3	+2	+5	+1
Mesh[T][S]	-11	+0	+13	-8	-2	+6	-2	-6	-2	+3	+10	-1
Mesh[T][S][FP]	-7	-3	+5	-8	+9	+8	+4	-0	+1	-7	+5	-4
Mesh[T][S]Sparse	-19	-6	+4	-17	+1	-0	-2	-1	-9	+3	+2	-4
Step[T]Alt	-7	-2	+8	-6	-4	+7	-0	-2	-0	-4	+8	-0
Step[T][S]	-11	-0	+14	-15	-7	+1	+5	+6	-4	+4	+9	+6
Step[T][S][FP]	-9	-1	+11	-2	-1	+4	+3	-2	+1	-0	+14	-7
Step[T][S][HP]	-2	-8	+9	-9	+3	+3	-2	-9	-11	-1	+7	+3
Step[T][S][HP]Async	-12	-2	+5	-6	+11	-0	-4	-9	+6	+1	-4	+2
Step[T][S][L]	-8	+0	+11	-6	+2	+8	-9	-0	-2	-1	+8	-0
Step[T][S][L]Cache	-10	+0	+7	-5	+1	+2	+4	-0	-1	+3	+9	-2
Step[T][S]Sparse	-10	-9	+4	-10	-5	+3	-2	-2	-2	-3	-0	-4
[T]Alt	-4	+1	+8	+4	-4	+5	+4	-3	-3	+2	-6	+1
[T][S]	-22	-5	+2	+3	+9	+8	-3	-2	-6	+4	+5	-2
[T][S][FP]	-12	-3	+10	-7	+9	+9	-1	-1	-3	-1	+7	-1
[T][S][HP]	-13	-9	+9	-2	+10	+8	+4	-2	-0	-6	+11	-8
[T][S][HP]Async	-6	-8	+8	-2	+3	+1	-1	-0	-1	-0	+1	-4
[T][S][L]	-10	-1	+11	-4	+3	+8	+2	-8	+1	+2	+8	-1
[T][S][L]Cache	-8	-1	+5	-5	+4	+8	-5	-0	-1	+3	+7	-2
[T][S]Sparse	-16	-10	+4	-14	-6	-0	-3	-4	-5	+3	-1	-4
step_sgd	-7	-0	+5	-6	+8	+3	+1	-2	+0	+1	+2	-1
step_tween	-9	-2	+9	-7	+3	+7	+1	-1	-4	-4	+7	-5
step_tween_chain	-1	-4	+14	-9	-5	+5	+6	-1	-1	+1	-2	-1
tween	-8	-3	+7	-5	+2	+8	+1	-3	-4	+0	+7	-1
tween_chain	-11	-4	+16	+2	+5	+3	+1	-2	+5	+0	+7	-6

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	+2	+5	+1	-12	+8	+2	-4	-1	+2	-1
Mesh[T]	+3	+1	+1	-2	+10	+4	-3	+4	+4	+1
Mesh[T]Alt	-3	-0	+5	-3	+13	+1	-12	-10	+2	-1
Mesh[T]Chain	-5	+0	-2	-3	+7	+2	-2	+2	+2	-7
Mesh[T][S]	+2	-0	+5	-9	+9	-8	-8	+0	-5	-0
Mesh[T][S][FP]	+1	-1	-1	-8	+8	-2	-6	-1	-4	-4
Mesh[T][S]Sparse	-4	-13	+1	-9	+3	-2	-6	-6	-7	-9
Step[T]Alt	+0	-2	-1	-3	+6	+0	-6	+1	+1	-1
Step[T][S]	-5	-0	+1	-4	+9	+2	-2	-2	+2	-7
Step[T][S][FP]	+0	-3	+5	-9	+14	+3	-5	+14	+1	-2
Step[T][S][HP]	+2	-5	-2	-4	+9	-0	+4	-6	+4	-3
Step[T][S][HP]Async	-1	-1	-2	-9	+10	-3	+3	+2	+0	-1
Step[T][S][L]	+0	-1	-2	-3	+8	+4	-5	+3	+2	-2
Step[T][S][L]Cache	-2	+0	-2	-4	+2	+1	-7	+1	+2	-1
Step[T][S]Sparse	-8	-6	-5	-8	+3	+4	-5	+1	-7	-9
[T]Alt	+6	-10	-6	-2	+11	+4	-10	+2	+5	-8
[T][S]	+4	-11	+0	-6	+12	-4	-3	-8	+2	+1
[T][S][FP]	+1	-1	-3	+4	+11	-1	-10	-4	+2	+2
[T][S][HP]	+6	-0	-3	+3	+8	+1	-5	-7	+2	-1
[T][S][HP]Async	+1	-2	-7	-0	+12	-6	-4	-1	+1	-3
[T][S][L]	+1	-2	+1	-3	+10	-0	-5	+2	+2	-0
[T][S][L]Cache	+2	-3	+0	-3	+4	+2	-5	+3	+2	-7
[T][S]Sparse	-11	-6	-2	-12	+7	+1	-6	-3	+3	-9
step_sgd	+5	-2	-1	-4	+14	+2	-4	+1	+6	-4
step_tween	+1	-1	-1	-6	+7	-3	-4	+3	-0	-1
step_tween_chain	+0	-3	-7	+1	+12	+3	+2	+2	+4	-1
tween	-2	-2	-3	-3	+7	+1	-5	+0	+3	-10
tween_chain	+2	-1	-1	-3	+7	+4	-7	+4	+2	-1

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	+47	+113	+71	+27	+11	+64	+77	+17	+20	+15	+35	+118
Mesh[T]	+1651	+616	+1321	+1579	+1472	+2734	+2345	+1549	+795	+703	+1571	+1524
Mesh[T]Alt	+283	-65	+207	+173	+192	+656	+575	-85	-27	-81	+287	-44
Mesh[T]Chain	+90	-15	+74	+43	+55	+47	+87	+174	+16	-9	+83	+133
Mesh[T][S]	+374	+287	+391	+339	+327	+420	+529	+78	+204	+243	+331	+312
Mesh[T][S][FP]	+363	+447	+374	+332	+358	+573	+510	+144	+154	+268	+410	+325
Mesh[T][S]Sparse	+2070	+1314	+1556	+1862	+1756	+2452	+2636	+1301	+603	+1546	+1797	+1911
Step[T]Alt	-61	-58	-35	-72	-111	-99	-107	-47	-34	-42	-124	-38
Step[T][S]	+385	+322	+371	+320	+374	+225	+394	+116	+149	+226	+332	+246
Step[T][S][FP]	+324	+249	+369	+279	+372	+234	+446	+117	+171	+267	+356	+331
Step[T][S][HP]	+409	+347	+319	+372	+382	+263	+472	+143	+167	+386	+336	+396
Step[T][S][HP]Async	+348	+314	+332	+336	+349	+149	+448	+85	+179	+191	+322	+367
Step[T][S][L]	+244	+181	+200	+205	+183	+137	+320	+71	+59	+220	+229	+195
Step[T][S][L]Cache	+172	+337	+203	+177	+218	+185	+378	+116	+105	+272	+225	+391
Step[T][S]Sparse	+1880	+1301	+1733	+1621	+1620	+1860	+2808	+938	+619	+1588	+1907	+1438
[T]Alt	+307	-120	+231	+285	+238	+1422	+607	-79	-51	-43	+319	-51
[T][S]	+351	+332	+331	+353	+334	+310	+478	+95	+174	+146	+346	+257
[T][S][FP]	+358	+285	+326	+447	+363	+180	+487	+122	+190	+300	+383	+387
[T][S][HP]	+451	+323	+417	+324	+383	+249	+473	+136	+101	+282	+475	+428
[T][S][HP]Async	+425	+289	+303	+297	+309	+203	+434	+177	+166	+331	+313	+252
[T][S][L]	+250	+170	+272	+261	+266	+141	+291	+99	+64	+166	+204	+189
[T][S][L]Cache	+247	+349	+225	+192	+136	+129	+273	+100	+152	+320	+284	+415
[T][S]Sparse	+1953	+1372	+1806	+1990	+1901	+2101	+2733	+1138	+620	+1788	+1930	+1159
step_sgd	+73	+6	+23	+34	+12	+49	+70	+43	+67	+63	+34	+114
step_tween	+160	+60	+51	+104	-6	+59	+68	+24	+2	+25	+1	+136
step_tween_chain	+34	+77	+51	+65	+20	+54	+52	+48	+24	+86	+43	+111
tween	+41	+61	+22	-67	-17	+92	+8	+50	+20	+25	-54	+68
tween_chain	+13	-44	-3	+11	-16	-10	+35	+28	+7	+18	-3	+63

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	-47	+6	+56	-9	+27	+68	+44	-6	-7	+21	+69	-4
Mesh[T]	+1576	+1644	+1124	+1673	+1681	+1004	+732	+1749	+1741	+221	+1554	+1528
Mesh[T]Alt	-162	-134	-1	-147	-61	-32	-30	-114	-127	-23	-50	-67
Mesh[T]Chain	-114	-105	+9	-54	-34	+11	-15	+60	-36	+11	-14	-8
Mesh[T][S]	+177	+224	+340	+149	+164	+220	+87	+190	+251	+196	+363	+241
Mesh[T][S][FP]	+337	+199	+204	+188	+419	+215	+187	+361	+344	+59	+320	+133
Mesh[T][S]Sparse	+762	+1231	+756	+672	+1458	+537	+798	+2031	+1051	+897	+1153	+1175
Step[T]Alt	-112	-137	-12	-105	-84	-7	-25	-105	-94	-42	-25	-42
Step[T][S]	+182	+249	+347	+68	+96	+133	+202	+471	+266	+149	+414	+379
Step[T][S][FP]	+237	+190	+235	+212	+255	+235	+190	+238	+316	+115	+510	+168
Step[T][S][HP]	+392	+111	+198	+154	+385	+161	+96	+132	+64	+114	+410	+311
Step[T][S][HP]Async	+135	+158	+170	+188	+454	+95	+124	+177	+357	+119	+104	+272
Step[T][S][L]	+86	+182	+141	+129	+196	+124	+14	+283	+167	+66	+267	+145
Step[T][S][L]Cache	+242	+235	+175	+199	+256	+91	+148	+365	+269	+171	+367	+198
Step[T][S]Sparse	+1394	+969	+855	+1363	+1114	+766	+601	+1948	+1673	+574	+1125	+1199
[T]Alt	-145	-130	-16	-139	-105	-11	-25	-153	-99	-23	-95	-50
[T][S]	-50	+180	+175	+419	+495	+239	+159	+341	+131	+149	+327	+235
[T][S][FP]	+140	+194	+299	+280	+436	+282	+144	+377	+253	+96	+360	+257
[T][S][HP]	+180	+69	+302	+342	+579	+222	+178	+343	+348	+63	+499	+181
[T][S][HP]Async	+264	+94	+214	+304	+335	+100	+157	+346	+310	+132	+238	+182
[T][S][L]	+66	+158	+129	+163	+254	+129	+97	+100	+176	+100	+283	+179
[T][S][L]Cache	+190	+255	+149	+203	+273	+180	+69	+418	+281	+171	+385	+229
[T][S]Sparse	+1048	+794	+846	+905	+1207	+603	+614	+1595	+1521	+923	+976	+1175
step_sgd	-5	-6	+51	-19	+109	+34	+10	+0	-12	+36	+27	+50
step_tween	+24	-20	+43	+45	+111	+43	+12	+97	+29	-19	+95	+48
step_tween_chain	+43	-32	+117	-100	-4	+41	+36	+28	+25	+47	-2	+63
tween	-51	-78	+16	+9	+21	+33	+13	-14	-3	+10	+85	+37
tween_chain	-116	-41	+73	+13	+71	+36	+10	-31	+41	+9	+41	-6

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	+42	+36	+42	-51	+81	+26	+26	+39	+88	+24
Mesh[T]	+1703	+1485	+1017	+1606	+1788	+894	+772	+1606	+1847	+1514
Mesh[T]Alt	-95	-119	-27	-94	-46	-42	-64	-89	-70	-82
Mesh[T]Chain	-51	-58	-24	-33	+10	-16	-9	-25	-18	-58
Mesh[T][S]	+294	+234	+312	+150	+371	+68	+124	+242	+205	+286
Mesh[T][S][FP]	+324	+218	+192	+255	+312	+175	+121	+267	+252	+201
Mesh[T][S]Sparse	+1470	+618	+1068	+1172	+1353	+745	+768	+1187	+953	+816
Step[T]Alt	-50	-121	-53	-61	-13	-46	-60	-34	-35	-82
Step[T][S]	+178	+303	+276	+240	+382	+184	+188	+247	+333	+157
Step[T][S][FP]	+346	+185	+283	+230	+502	+191	+145	+539	+315	+221
Step[T][S][HP]	+300	+133	+175	+302	+427	+123	+227	+193	+445	+194
Step[T][S][HP]Async	+207	+215	+152	+148	+402	+93	+228	+257	+277	+310
Step[T][S][L]	+154	+190	+94	+200	+289	+80	+31	+230	+275	+121
Step[T][S][L]Cache	+248	+256	+118	+287	+243	+123	+72	+343	+301	+218
Step[T][S]Sparse	+1071	+1172	+820	+1203	+1256	+872	+767	+1560	+1042	+860
[T]Alt	-78	-141	-63	-80	-40	-38	-62	-61	-52	-106
[T][S]	+415	+55	+209	+271	+484	+119	+158	+134	+324	+242
[T][S][FP]	+408	+222	+188	+429	+419	+180	+101	+233	+403	+319
[T][S][HP]	+408	+314	+113	+483	+416	+172	+128	+158	+332	+255
[T][S][HP]Async	+336	+212	+117	+342	+373	+92	+162	+257	+321	+171
[T][S][L]	+239	+132	+120	+197	+292	+68	+73	+243	+317	+155
[T][S][L]Cache	+316	+188	+181	+264	+303	+149	+108	+294	+383	+96
[T][S]Sparse	+797	+1257	+854	+1055	+1542	+781	+697	+1283	+1914	+910
step_sgd	+84	+29	+26	+29	+149	+37	+17	+54	+97	-26
step_tween	+91	-25	+4	+29	+124	-21	+3	+122	+120	+75
step_tween_chain	+34	+10	+1	+50	+154	+27	+19	+80	+116	+39
tween	+24	-44	-17	+65	+97	-5	-17	+36	+114	-27
tween_chain	+21	-7	+3	+20	+60	+5	-22	+37	+27	-17

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	+2	+2	+4	-1	-1	+4	+3	+1	+3	+1	+0	+2
Mesh[T]	+26	+14	+24	+30	+23	+26	+22	+23	+31	+17	+28	+31
Mesh[T]Alt	+9	-5	+6	+2	+3	+14	+10	-6	-5	-6	+8	-5
Mesh[T]Chain	+3	-2	+2	+0	+2	+7	+3	+7	+6	-0	+2	+2
Mesh[T][S]	+12	+7	+13	+10	+9	+14	+11	+3	+6	+11	+10	+10
Mesh[T][S][FP]	+10	+7	+12	+9	+10	+17	+10	+7	+15	+12	+13	+9
Mesh[T][S]Sparse	+36	+35	+28	+36	+27	+30	+29	+29	+36	+32	+31	+38
Step[T]Alt	-4	-5	-3	-6	-5	-1	-3	-1	-5	-2	-4	-5
Step[T][S]	+12	+9	+11	+8	+10	+4	+8	+6	+10	+8	+9	+13
Step[T][S][FP]	+10	+8	+12	+7	+10	+5	+9	+4	+13	+12	+12	+11
Step[T][S][HP]	+13	+12	+9	+11	+10	+5	+9	+7	+10	+11	+10	+15
Step[T][S][HP]Async	+10	+10	+12	+10	+9	+2	+9	+2	+15	+10	+9	+14
Step[T][S][L]	+10	+4	+6	+6	+5	+3	+8	+2	+3	+10	+7	+11
Step[T][S][L]Cache	+5	+11	+7	+4	+7	+5	+11	+4	+11	+10	+8	+11
Step[T][S]Sparse	+35	+32	+36	+32	+28	+16	+33	+21	+37	+36	+34	+33
[T]Alt	+8	-8	+7	+9	+7	+12	+11	-5	-8	-5	+10	-6
[T][S]	+10	+11	+10	+9	+7	+6	+10	+5	+14	+8	+9	+12
[T][S][FP]	+11	+10	+10	+16	+9	+2	+10	+4	+11	+10	+12	+12
[T][S][HP]	+14	+13	+14	+8	+11	+5	+10	+7	+9	+11	+15	+16
[T][S][HP]Async	+13	+11	+9	+6	+7	+4	+8	+9	+11	+12	+9	+16
[T][S][L]	+9	+8	+11	+10	+9	+3	+7	+4	+4	+6	+5	+6
[T][S][L]Cache	+9	+12	+7	+5	+2	+3	+6	+4	+10	+14	+10	+11
[T][S]Sparse	+35	+34	+35	+38	+33	+17	+31	+26	+38	+37	+37	+38
step_sgd	+4	+0	-0	+1	-1	+1	+3	+3	+5	+3	-0	+4
step_tween	+6	+1	+3	+3	-0	+2	+4	-0	-1	+3	-0	+4
step_tween_chain	+1	+2	-0	+1	+2	+1	+2	+3	+1	+4	+1	+2
tween	+2	+1	-0	+1	+3	+2	+4	+4	+4	-0	-3	+2
tween_chain	+1	-2	-2	+0	-2	-1	+2	+2	-1	-0	-1	+2

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	+2	-1	+6	+1	-0	+4	-1	-2	+2	+2	+1	+3
Mesh[T]	+25	+22	+32	+24	+25	+35	+26	+26	+22	+10	+22	+32
Mesh[T]Alt	-6	-12	-3	-7	-9	-3	-7	-7	-9	-0	-10	-5
Mesh[T]Chain	-2	-6	-2	+0	-5	-2	-1	-0	+1	+2	-4	+0
Mesh[T][S]	+10	+5	+17	+7	+5	+15	+8	+2	+9	+14	+8	+10
Mesh[T][S][FP]	+13	+5	+14	+7	+6	+14	+10	+8	+8	+11	+9	+9
Mesh[T][S]Sparse	+35	+32	+39	+32	+27	+36	+39	+32	+32	+28	+29	+36
Step[T]Alt	-1	-11	-3	-4	-5	-2	-1	-7	-7	-3	-7	-3
Step[T][S]	+11	+6	+14	+9	+7	+13	+12	+7	+10	+8	+8	+11
Step[T][S][FP]	+11	+5	+11	+6	+8	+17	+15	+4	+8	+8	+10	+9
Step[T][S][HP]	+11	+9	+11	+8	+12	+12	+10	+6	+9	+10	+12	+11
Step[T][S][HP]Async	+11	+3	+11	+6	+7	+9	+11	+8	+7	+7	+6	+11
Step[T][S][L]	+4	+4	+7	+5	+5	+10	+8	+9	+5	+6	+7	+7
Step[T][S][L]Cache	+14	+4	+13	+6	+6	+12	+9	+7	+7	+13	+8	+9
Step[T][S]Sparse	+30	+31	+36	+35	+35	+38	+33	+33	+32	+22	+34	+36
[T]Alt	-6	-12	-5	-9	-10	-3	-4	-12	-5	+0	-8	-4
[T][S]	+11	+5	+16	+10	+8	+15	+14	+9	+6	+8	+9	+13
[T][S][FP]	+10	+5	+16	+11	+9	+20	+10	+9	+9	+9	+9	+11
[T][S][HP]	+11	+7	+16	+10	+12	+13	+10	+8	+11	+8	+12	+10
[T][S][HP]Async	+10	+7	+12	+8	+9	+12	+14	+7	+8	+10	+9	+9
[T][S][L]	+5	+3	+6	+6	+7	+9	+7	+6	+4	+6	+7	+10
[T][S][L]Cache	+7	+7	+12	+7	+4	+12	+9	+7	+8	+11	+11	+11
[T][S]Sparse	+36	+26	+38	+34	+36	+37	+35	+31	+36	+28	+32	+34
step_sgd	+4	-2	+4	+0	+1	+3	-1	-2	-4	+4	-1	+4
step_tween	+4	-2	+2	+4	+2	+3	+1	+1	+0	-1	-1	+5
step_tween_chain	+0	-4	+5	-3	-2	+3	+0	+1	+0	+4	-2	+3
tween	-1	-6	-0	+3	-2	+1	+1	-3	+0	+1	+1	+2
tween_chain	-2	-1	+1	+1	+1	+4	-1	-3	-0	-0	-2	+3

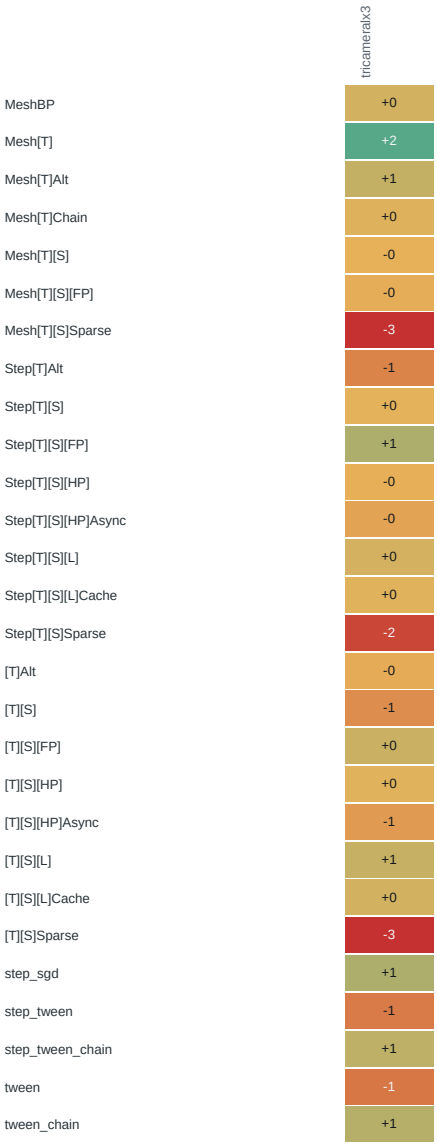
AvailD vs sgd, every mode x dtype (cols 25-34)

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

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	+1	-2	+3	+2	-1	-0	+5	+2	+4	+1
Mesh[T]	+28	+24	+30	+26	+27	+25	+30	+26	+28	+28
Mesh[T]Alt	-7	-10	-2	-6	-11	-7	-6	-3	-6	-6
Mesh[T]Chain	-1	-4	-2	-1	-4	-6	+1	-3	-2	-4
Mesh[T][S]	+8	+6	+17	+9	+8	+8	+13	+8	+16	+10
Mesh[T][S][FP]	+11	+5	+14	+12	+5	+11	+12	+9	+15	+7
Mesh[T][S]Sparse	+34	+28	+33	+34	+35	+31	+34	+37	+30	+27
Step[T]Alt	-3	-9	-6	-3	-6	-9	-8	-2	-3	-10
Step[T][S]	+11	+7	+14	+10	+9	+7	+12	+12	+11	+8
Step[T][S][FP]	+13	+7	+11	+11	+8	+8	+13	+8	+11	+8
Step[T][S][HP]	+8	+5	+12	+13	+12	+3	+13	+11	+12	+5
Step[T][S][HP]Async	+7	+6	+11	+11	+10	+6	+10	+7	+10	+12
Step[T][S][L]	+4	+7	+8	+10	+9	+0	+1	+5	+12	+4
Step[T][S][L]Cache	+10	+6	+7	+12	+9	+8	+6	+13	+8	+7
Step[T][S]Sparse	+35	+32	+36	+32	+32	+27	+33	+32	+34	+31
[T]Alt	-8	-9	-8	-4	-11	-9	-6	-6	-5	-8
[T][S]	+12	+9	+12	+12	+10	+10	+11	+9	+11	+6
[T][S][FP]	+15	+5	+14	+10	+8	+11	+12	+10	+15	+8
[T][S][HP]	+10	+11	+7	+11	+11	+7	+9	+11	+11	+8
[T][S][HP]Async	+11	+6	+15	+12	+6	+3	+13	+10	+11	+6
[T][S][L]	+10	+4	+8	+9	+8	+2	+8	+8	+13	+6
[T][S][L]Cache	+9	+6	+12	+9	+12	+8	+9	+6	+12	+5
[T][S]Sparse	+37	+30	+31	+37	+30	+28	+30	+34	+32	+32
step_sgd	+2	+2	+2	+4	-0	+1	+3	+2	+2	-5
step_tween	+2	-3	+1	+1	+0	-8	+2	+4	+6	+0
step_tween_chain	+2	-0	+0	+2	-0	+0	+2	+4	+2	-1
tween	+2	-2	-1	+5	+1	-4	-3	+1	+6	+1
tween_chain	-0	-1	-0	+3	-2	-5	-2	-1	+0	-3

AccD vs sgd, every mode x arch

AccD vs sgd, every mode x arch



Family collapse - Step* vs non-Step

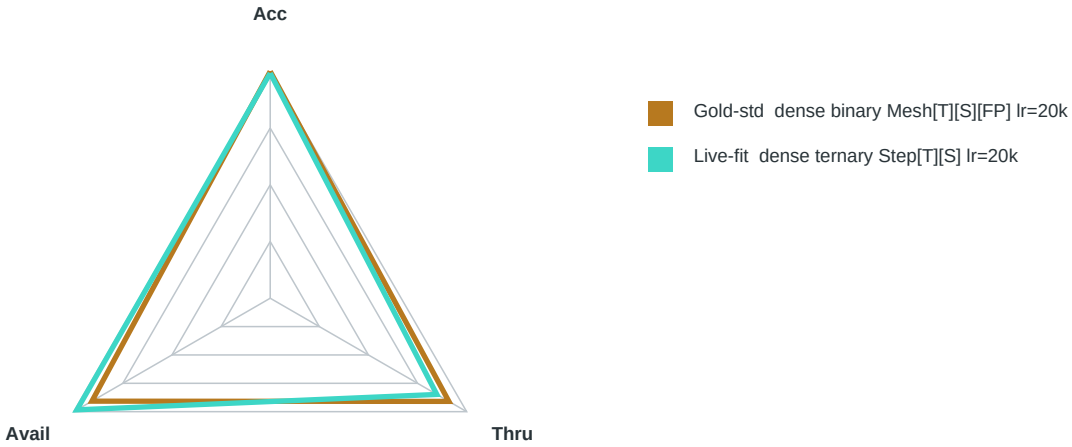
Step* is a 1D pipe (one sample enters layer 0 per tick; output is the sample that entered depth ticks ago). Non-Step of the same family is a full-chain update. AccD is a real scheduler split, not leftover warm-up forwards.

step	plain	n	mean |AccD|
Step[T]Alt	[T]Alt	34	8.48
Step[T][S]	[T][S]	34	8.88
Step[T][S][FP]	[T][S][FP]	34	6.30
Step[T][S][HP]	[T][S][HP]	34	6.64
Step[T][S][HP]Async	[T][S][HP]Async	34	5.12
Step[T][S][L]	[T][S][L]	34	3.50
Step[T][S][L]Cache	[T][S][L]Cache	34	2.92
Step[T][S]Sparse	[T][S]Sparse	34	5.59
step_sgd	sgd	34	3.00
step_tween	tween	34	3.65
step_tween_chain	tween_chain	34	5.63

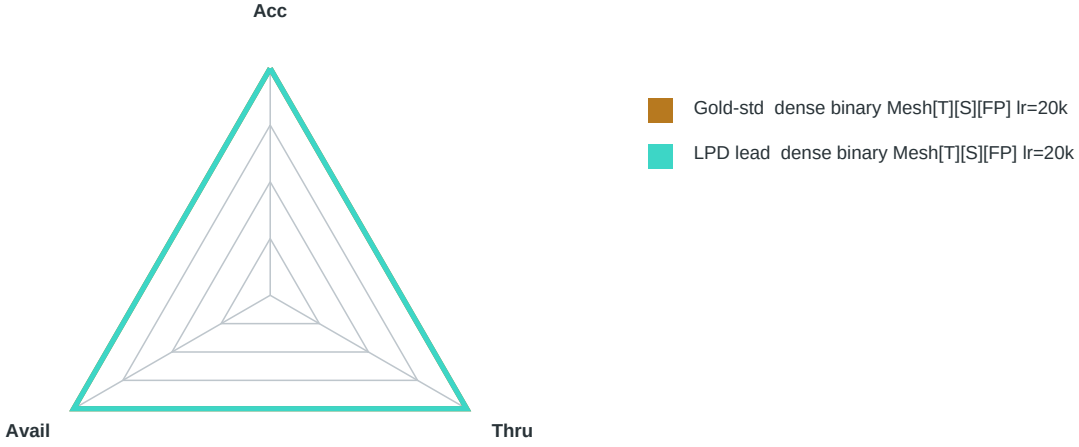
Consciousness - Acc, Throughput, Availability

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 dense|int8|Step[T][S][HP]Async|lr=10m Acc 50.0 Thru 6287 Avail 21.6% 3.9 KiB (RAM reference)
Lucy Score champ (T x Avail x Acc) dense|float32|Mesh[T]|lr=20k Score 3477.4 Acc 24.8 Soft 0 15.8 KiB
Live-fit champ (best Q) dense|ternary|Step[T][S]|lr=20k Acc 49.6 Thru 8299 Avail 32.4% 1.0 KiB
Gold-std (2+ pillars, Acc keep >= 80%, then smallest then fastest): dense|binary|Mesh[T][S][FP]|lr=20k mode Mesh[T][S][FP] Acc 50.0 Thru 8899 0.5 KiB
Board fastest dense|float32|[T][S]Sparse|lr=20k Thru 41510 (traps may own this) Best availability dense|complex64|[T][S]Sparse|lr=100m 74.0%
Learner Thru peak 9785 learner Avail peak 32.9%

Consciousness radar - Acc / Thru / Avail vs learner peaks



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



Gold - trifecta >=80% at <=20% of Acc-champ RAM

Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
gold	dense binary Mesh[T][S][FP] lr=20k	100	91	91	94	12	8.0	7.50	50.0	8899	0.5

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

Mode	n	Acc	KiB	Thru	Cell
Mesh[T][S][FP]	2	50.0	0.5	8899	dense binary Mesh[T][S][FP] lr=20k
[T][S][HP]	4	50.0	1.0	9785	dense ternary [T][S][HP] lr=1m / dense int4 [T][S][HP] lr=20k
Step[T][S][FP]	5	50.0	1.0	8673	dense ternary Step[T][S][FP] lr=10m / dense uint4 Step[T][S][FP] lr=~
Step[T][S]	3	50.0	1.0	8299	dense ternary Step[T][S] lr=20k
Mesh[T][S]	4	50.0	1.5	7275	dense uint3 Mesh[T][S] lr=10m / dense uintptr Mesh[T][S] lr=20k
[T][S]	4	50.0	2.0	9154	dense uint4 [T][S] lr=20k
[T][S][FP]	3	50.0	2.0	8823	dense int4 [T][S][FP] lr=100m / dense uint32 [T][S][FP] lr=20k
Step[T][S][HP]	3	49.6	3.0	8880	dense uint6 Step[T][S][HP] lr=100m / dense int16 Step[T][S][HP] lr=~
Step[T][S][HP]Async	1	50.0	3.0	3798	dense uint6 Step[T][S][HP]Async lr=1m
step_tween_chain	1	49.6	3.9	3909	dense fp8e4m3 Step[T]Chain lr=10m

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

Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
near	dense ternary Step[T][S] lr=20k	99	85	98	94	25	4.0	3.76	49.6	8299	1.0
near	dense ternary [T][S][HP] lr=1m	100	71	98	89	25	4.0	3.55	50.0	6996	1.0
near	dense uint2 Step[T][S] lr=20k	100	82	83	88	25	4.0	3.51	50.0	8006	1.0
near	dense ternary Step[T][S][FP] lr=10m	91	66	98	84	25	4.0	3.35	45.3	6503	1.0
near	dense uint3 Step[T][S][FP] lr=20k	100	53	98	80	38	2.7	2.14	50.0	5161	1.5
near	dense uint3 Mesh[T][S] lr=10m	100	37	93	70	38	2.7	1.87	50.0	3635	1.5
near	dense uint4 [T][S] lr=20k	100	94	85	93	50	2.0	1.86	50.0	9154	2.0
near	dense int4 [T][S] lr=1m	100	83	94	92	50	2.0	1.84	50.0	8078	2.0
near	dense int4 [T][S][HP] lr=20k	100	100	76	91	50	2.0	1.83	50.0	9785	2.0
near	dense uint4 Step[T][S][FP] lr=20k	100	89	85	91	50	2.0	1.82	50.0	8673	2.0
near	dense uint4 Mesh[T][S] lr=10m	100	70	85	84	50	2.0	1.68	50.0	6828	2.0
near	dense int4 [T][S][FP] lr=100m	88	65	82	78	50	2.0	1.55	43.8	6344	2.0

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
gold	dense binary Mesh[T][S][FP] lr=20k	100	91	91	94	12	8.0	7.50	50.0	8899	0.5
acc	dense binary MeshBP lr=1m	100	49	52	63	12	8.0	5.06	50.0	4782	0.5
near	dense ternary Step[T][S] lr=20k	99	85	98	94	25	4.0	3.76	49.6	8299	1.0
acc	dense binary Mesh[T]Alt lr=20k	99	33	29	46	12	8.0	3.66	49.6	3225	0.5
near	dense ternary [T][S][HP] lr=1m	100	71	98	89	25	4.0	3.55	50.0	6996	1.0
near	dense uint2 Step[T][S] lr=20k	100	82	83	88	25	4.0	3.51	50.0	8006	1.0
near	dense ternary Step[T][S][FP] lr=10m	91	66	98	84	25	4.0	3.35	45.3	6503	1.0
acc	dense ternary Mesh[T][S] lr=100m	99	72	77	82	25	4.0	3.29	49.6	7073	1.0
acc	dense uint2 MeshBP lr=10m	100	41	42	56	25	4.0	2.24	50.0	4039	1.0
acc	dense uint2 Mesh[T]Chain lr=1m	100	37	44	54	25	4.0	2.18	50.0	3605	1.0
near	dense uint3 Step[T][S][FP] lr=20k	100	53	98	80	38	2.7	2.14	50.0	5161	1.5
acc	dense int3 Step[T][S] lr=20k	99	61	79	78	38	2.7	2.08	49.6	5939	1.5
-	dense uint3 Step[T][S] lr=20k	75	58	99	76	38	2.7	2.02	37.5	5722	1.5
near	dense uint3 Mesh[T][S] lr=10m	100	37	93	70	38	2.7	1.87	50.0	3635	1.5
near	dense uint4 [T][S] lr=20k	100	94	85	93	50	2.0	1.86	50.0	9154	2.0
near	dense int4 [T][S] lr=1m	100	83	94	92	50	2.0	1.84	50.0	8078	2.0
near	dense int4 [T][S][HP] lr=20k	100	100	76	91	50	2.0	1.83	50.0	9785	2.0
near	dense uint4 Step[T][S][FP] lr=20k	100	89	85	91	50	2.0	1.82	50.0	8673	2.0
near	dense uint4 Mesh[T][S] lr=10m	100	70	85	84	50	2.0	1.68	50.0	6828	2.0
acc	dense binary [T]Alt lr=100m	99	23	4	21	12	8.0	1.66	49.6	2272	0.5

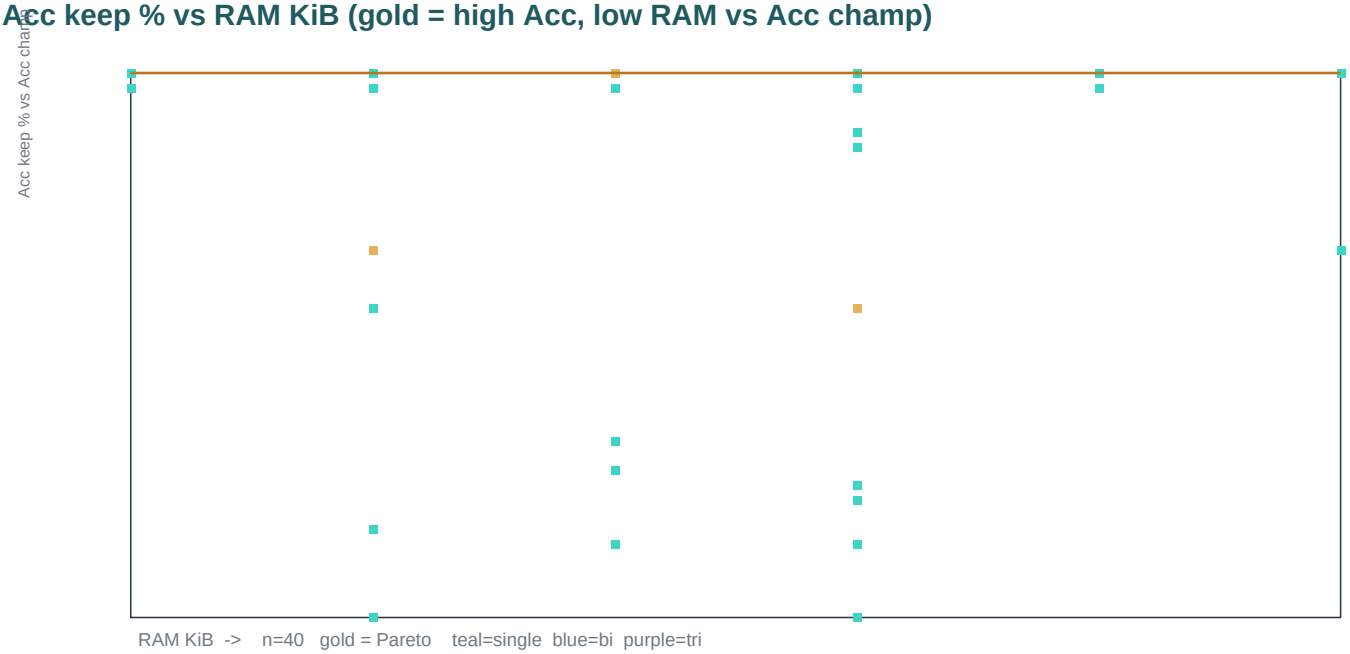
Consciousness rank - Q = geomean Acc/Thru/Avail keep

Band	Cell	Acc%	Thru%	Avail%	Q%	LPD	Thru	Avail
near	dense ternary Step[T][S] lr=20k	99	85	98	94	3.76	8299	32.4
keep	dense uint32 [T][S][HP] lr=20k	100	91	90	94	0.23	8929	29.8
gold	dense binary Mesh[T][S][FP] lr=20k	100	91	91	94	7.50	8899	29.9
near	dense uint4 [T][S] lr=20k	100	94	85	93	1.86	9154	28.1
near	dense int4 [T][S] lr=1m	100	83	94	92	1.84	8078	31.0
near	dense int4 [T][S][HP] lr=20k	100	100	76	91	1.83	9785	25.0
near	dense uint4 Step[T][S][FP] lr=20k	100	89	85	91	1.82	8673	28.1
keep	dense uint64 Step[T][S][FP] lr=1m	99	76	98	90	0.11	7442	32.3
keep	dense int32 [T][S] lr=20k	99	90	80	89	0.22	8762	26.3
near	dense ternary [T][S][HP] lr=1m	100	71	98	89	3.55	6996	32.2

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

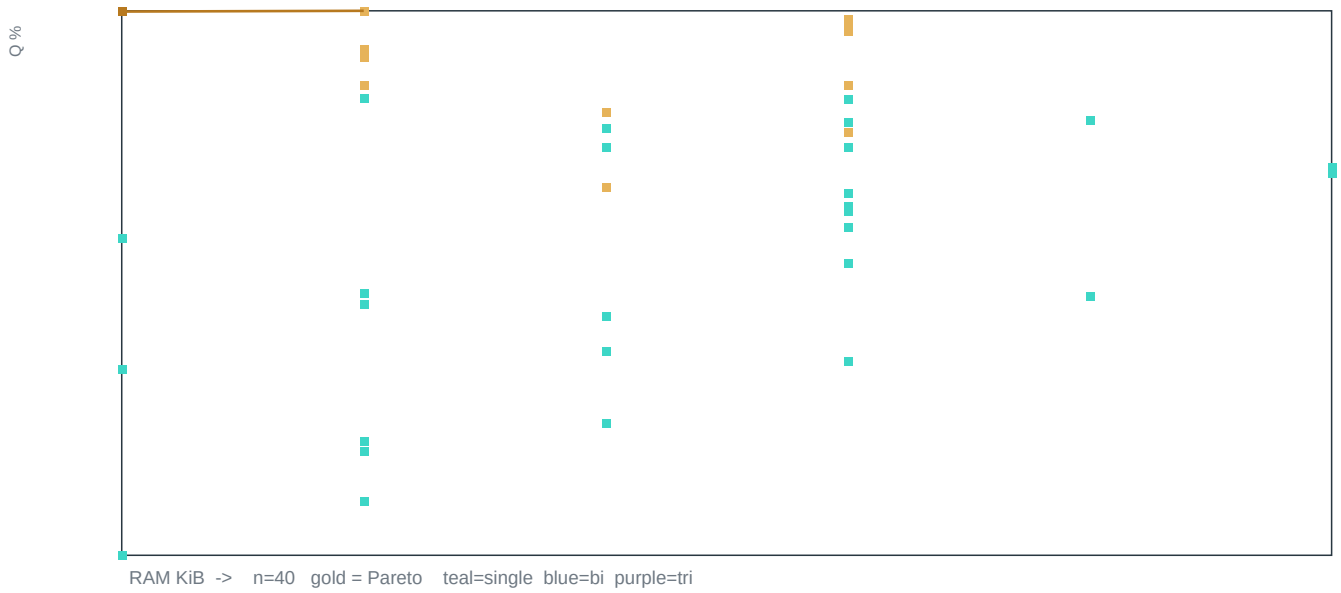
Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
trap	dense binary NormalBP lr=20k	43	40	42	42	12	8.0	0.00	21.3	3962	0.5
trap	dense binary StepBP lr=20k	47	44	63	51	12	8.0	0.00	23.6	4348	0.5
trap	dense binary [T] lr=20k	49	63	58	56	12	8.0	0.00	24.6	6126	0.5
trap	dense binary [T]Chain lr=20k	25	50	52	40	12	8.0	0.00	12.5	4863	0.5
trap	dense binary Step[T] lr=20k	42	68	58	55	12	8.0	0.00	21.0	6647	0.5
trap	dense binary Step[T]Chain lr=20k	48	58	61	55	12	8.0	0.00	23.8	5707	0.5
trap	dense binary MeshBP lr=20k	49	57	58	54	12	8.0	0.00	24.6	5586	0.5
trap	dense binary Mesh[T] lr=20k	49	100	94	77	12	8.0	0.00	24.7	12698	0.5
trap	dense binary Mesh[T]Chain lr=20k	48	44	45	45	12	8.0	0.00	24.1	4259	0.5
trap	dense binary [T][S] lr=20k	39	90	91	68	12	8.0	0.00	19.5	8805	0.5

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

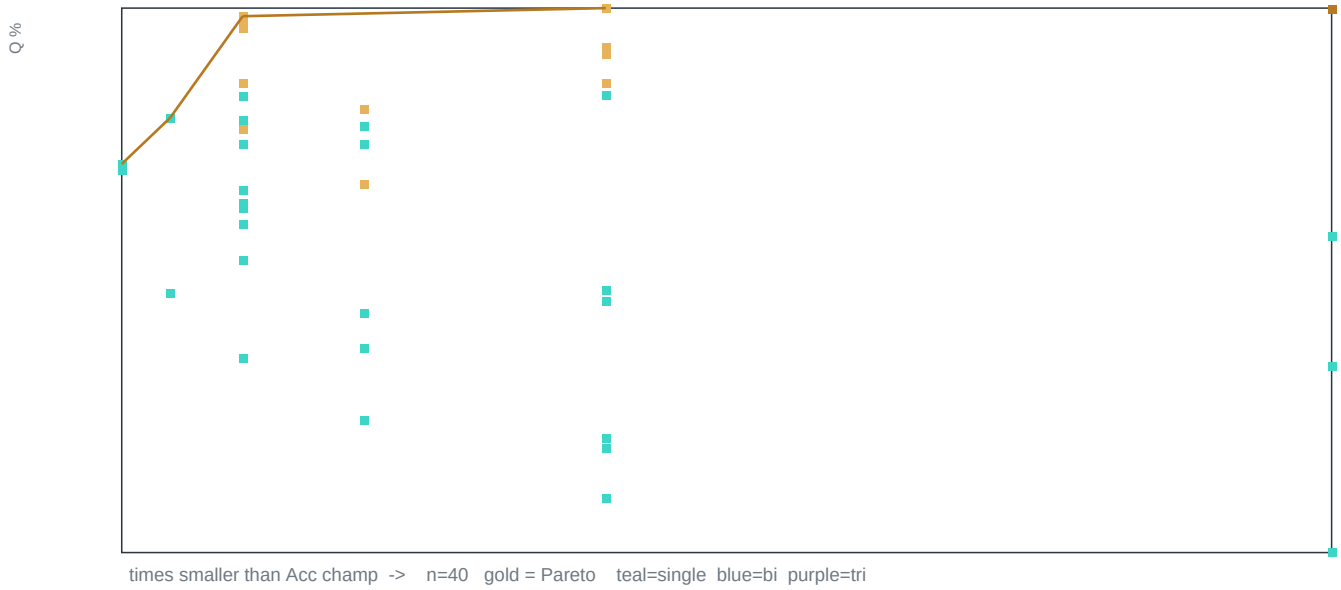


Q% vs RAM KiB (gold = high consciousness, low RAM)

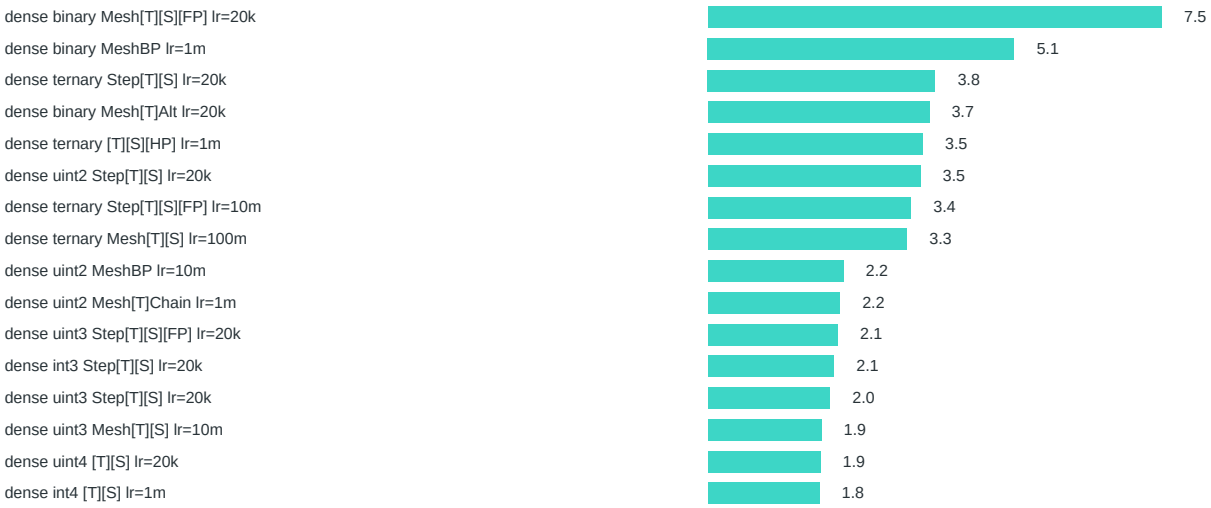
Q% vs RAM KiB (gold = high consciousness, low RAM)



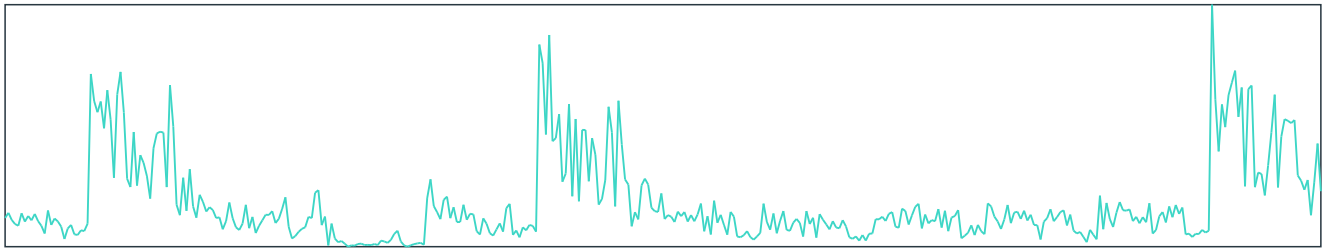
Q% vs shrink vs Acc champ (gold = upper right)



Top Lucy density (LPD)

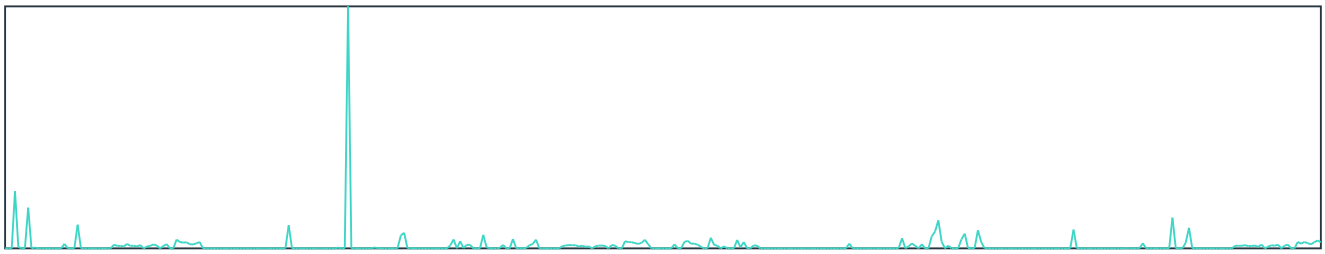


Live pulse (Score)



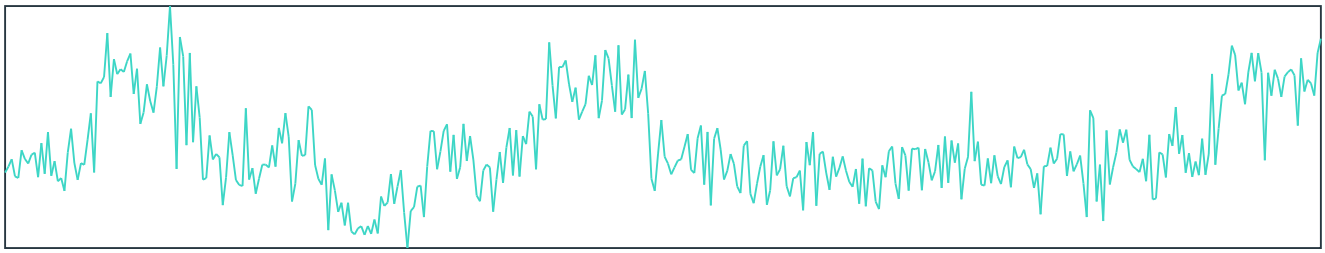
n=400 min=0.00 max=3418.94

Live pulse (SoftAcc)



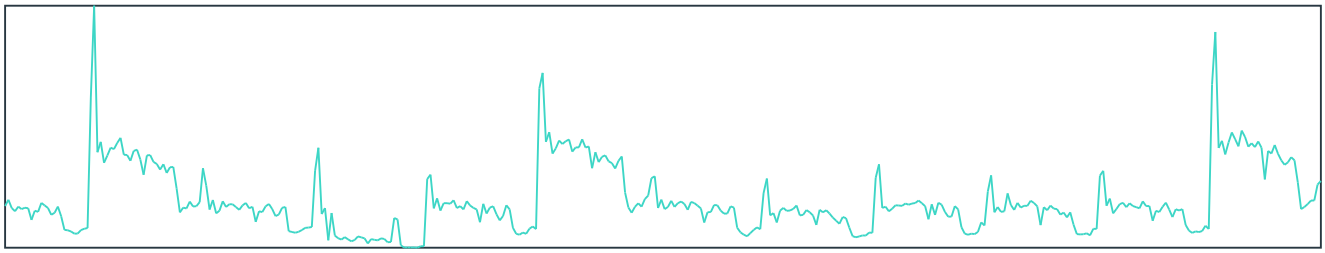
n=400 min=0.00 max=78.58

Live pulse (Availability)



n=400 min=0.01 max=73.97

Live pulse (Throughput)



n=400 min=1033.96 max=36307.47

Queue by train mode (this epoch)

Mode	Done	Run	Left	Total
sgd	136	0	0	136
step_sgd	136	0	0	136
tween	136	0	0	136
tween_chain	136	0	0	136
step_tween	136	0	0	136
step_tween_chain	135	0	1	136
MeshBP	136	0	0	136
Mesh[T]	136	0	0	136
Mesh[T]Chain	136	0	0	136

[T][S]	136	0	0	136
Step[T][S]	136	0	0	136
[T]Alt	136	0	0	136
Step[T]Alt	136	0	0	136
[T][S][HP]	136	0	0	136
[T][S][L]	136	0	0	136
[T][S][FP]	136	0	0	136
[T][S][L]Cache	136	0	0	136
[T][S][HP]Async	136	0	0	136
[T][S]Sparse	136	0	0	136
Mesh[T][S]	136	0	0	136
Mesh[T]Alt	136	0	0	136
Mesh[T][S][FP]	136	0	0	136
Mesh[T][S]Sparse	136	0	0	136
Step[T][S][HP]	136	0	0	136
Step[T][S][L]	136	0	0	136
Step[T][S][FP]	136	0	0	136
Step[T][S][L]Cache	136	0	0	136
Step[T][S][HP]Async	136	0	0	136
Step[T][S]Sparse	136	0	0	136