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 0.02 - 2026-08-27 00:55:32 - 0.0.0.0:8080

This epoch 3944 / 3944 cells. Recorded 3944 results. Learning rate 0.02.
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|uintptr|Mesh[T]|lr=2	330.57	49.1	14.1	7139.2	32.8
throughput	dense|float32|[T][S]Sparse|lr=0.02	2980.19	3.5	24.9	44673.7	26.8
availability	dense|fp8e5m2|Step[T][S]Sparse|lr=200	2266.68	0.0	24.6	13756.5	66.9
lucy score	dense|float32|Mesh[T][S]Sparse|lr=0.02	3777.11	7.2	24.8	35354.0	43.0
mobile score (trap)	dense|binary|[T][S]Sparse|lr=0.02	2545.00	25.5	22.8	21217.8	52.5
acc/sec	dense|fp4|Mesh[T][S]|lr=2k	145.23	0.1	50.0	4476.5	15.7

Lucy axis champions (this tide)

Axis	Mode	DType	Arch	Value
hard_acc	step_sgd	complex128	tricameralx3	50.00
throughput	[T][S]Sparse	float32	tricameralx3	44673.70
availability	Step[T][S]Sparse	fp8e5m2	tricameralx3	66.91
score	Mesh[T][S]Sparse	float32	tricameralx3	3777.11
soft_acc	Mesh[T]	uintptr	tricameralx3	49.06
acc_thru	Step[T][S]Sparse	float32	tricameralx3	11239.55
realtime	Mesh[T][S]Sparse	float32	tricameralx3	15217.80
adapt	Mesh[T]	uintptr	tricameralx3	51.19
keep_learn	Mesh[T][S]	fp4	tricameralx3	25.00
acc_per_sec	Mesh[T][S]	fp4	tricameralx3	25.00
consistency	sgd	float32	tricameralx3	100.00
stability	sgd	fp4	tricameralx3	100.00
mobile_score	[T][S]Sparse	binary	tricameralx3	5294882.49
lpd	Mesh[T][S]Sparse	binary	tricameralx3	2.77
mspeed	[T][S]Sparse	uint64	tricameralx3	1.00
mavail	[T][S]Sparse	uintptr	tricameralx3	1.00
mix	Mesh[T][S]Sparse	uint4	tricameralx3	0.96
gold_std	Mesh[T][S]Sparse	binary	tricameralx3	0.49

Best settings per train mode

Mode	DType	Format	Score	Soft	Acc	Avail	n
Mesh[T][S]Sparse	float32	none	3777.1	7.2	24.8	43.0	136
Step[T][S]Sparse	float64	none	3501.3	10.3	25.2	42.4	136
[T][S]Sparse	float64	none	3468.7	3.0	26.0	41.5	136
Mesh[T]	float32	none	2743.3	0.0	24.7	41.2	135
[T]Alt	float32	none	1761.8	0.0	24.7	18.9	136
Mesh[T][S][FP]	float64	none	1355.0	18.3	32.3	27.5	136
[T][S][FP]	float64	none	1284.5	24.8	34.6	25.1	136
[T][S][HP]	float64	none	1237.6	24.0	33.3	25.5	136
Step[T][S][HP]	complex64	none	1144.5	31.8	40.1	32.5	136
Step[T][S][FP]	float64	none	1117.2	19.8	31.8	23.1	136
[T][S]	float64	none	1083.2	9.6	29.0	26.2	136

Mesh[T][S]	float64	none	1055.5	8.3	28.4	24.3	136
Step[T][S][HP]Async	float64	none	1020.3	5.2	27.8	24.5	136
Mesh[T]Alt	float32	none	988.9	18.4	35.4	18.2	136
Step[T][S]	complex128	none	922.0	11.7	29.2	30.6	136
[T][S][L]Cache	ternary	none	868.4	16.5	26.0	34.7	136
[T][S][HP]Async	float16	none	809.5	7.1	29.2	28.5	136
[T][S][L]	float64	none	799.6	7.6	31.1	20.6	136
Step[T][S][L]	float64	none	772.0	5.7	27.2	22.0	136
Step[T][S][L]Cache	float64	none	706.2	4.1	23.6	23.5	136
MeshBP	int64	none	650.1	42.7	0.4	20.5	136
tween_chain	float64	none	621.1	40.1	2.0	17.8	136
step_tween_chain	int	none	569.0	34.6	1.2	25.0	136
step_sgd	int	none	515.2	37.6	1.2	24.5	136
Mesh[T]Chain	int64	none	512.3	42.6	0.4	19.4	136
sgd	int64	none	498.8	44.7	0.4	18.2	136
tween	float64	none	451.3	31.3	0.8	17.6	136
step_tween	float64	none	415.6	3.0	25.3	16.0	136
Step[T]Alt	float64	none	162.9	0.0	24.4	13.0	136

Best dtype per mode

Mode	Winner dtype	Score	Soft	Acc
Mesh[T][S]Sparse	float32	3777.1	7.2	24.8
Step[T][S]Sparse	float64	3501.3	10.3	25.2
[T][S]Sparse	float64	3468.7	3.0	26.0
Mesh[T]	float32	2743.3	0.0	24.7
[T]Alt	float32	1761.8	0.0	24.7
Mesh[T][S][FP]	float64	1355.0	18.3	32.3
[T][S][FP]	float64	1284.5	24.8	34.6
[T][S][HP]	float64	1237.6	24.0	33.3
Step[T][S][HP]	complex64	1144.5	31.8	40.1
Step[T][S][FP]	float64	1117.2	19.8	31.8
[T][S]	float64	1083.2	9.6	29.0
Mesh[T][S]	float64	1055.5	8.3	28.4
Step[T][S][HP]Async	float64	1020.3	5.2	27.8
Mesh[T]Alt	float32	988.9	18.4	35.4
Step[T][S]	complex128	922.0	11.7	29.2
[T][S][L]Cache	ternary	868.4	16.5	26.0
[T][S][HP]Async	float16	809.5	7.1	29.2
[T][S][L]	float64	799.6	7.6	31.1
Step[T][S][L]	float64	772.0	5.7	27.2
Step[T][S][L]Cache	float64	706.2	4.1	23.6
MeshBP	int64	650.1	42.7	0.4
tween_chain	float64	621.1	40.1	2.0
step_tween_chain	int	569.0	34.6	1.2
step_sgd	int	515.2	37.6	1.2
Mesh[T]Chain	int64	512.3	42.6	0.4
sgd	int64	498.8	44.7	0.4
tween	float64	451.3	31.3	0.8
step_tween	float64	415.6	3.0	25.3
Step[T]Alt	float64	162.9	0.0	24.4

Best mode per dtype

DType	Winner mode	Score	Soft	Acc
float32	Mesh[T][S]Sparse	3777.1	7.2	24.8
float64	Mesh[T][S]Sparse	3611.0	6.8	25.6
int64	[T][S]Sparse	3153.6	3.1	26.7
complex128	Mesh[T][S]Sparse	2999.9	3.8	26.2
complex64	Mesh[T][S]Sparse	2927.5	3.1	25.8
uint16	Mesh[T][S]Sparse	2925.6	21.1	24.6
int8	Mesh[T][S]Sparse	2867.9	23.2	24.2
int32	[T][S]Sparse	2818.2	21.6	0.4
bfloat16	Mesh[T][S]Sparse	2784.0	0.2	24.7
int	Step[T][S]Sparse	2781.7	6.4	25.2
int16	Mesh[T][S]Sparse	2771.6	21.2	24.3
uint32	Mesh[T][S]Sparse	2692.3	0.4	23.4
uint8	Step[T][S]Sparse	2667.8	25.8	24.3
float16	Mesh[T][S]Sparse	2605.0	18.9	28.3
ternary	[T][S]Sparse	2599.4	23.3	24.0
binary	[T][S]Sparse	2545.0	25.5	22.8
uint64	[T][S]Sparse	2490.4	21.0	48.8
uint	Mesh[T][S]Sparse	2422.1	21.9	24.8
int4	Mesh[T][S]Sparse	2391.4	17.5	22.7
fp8e4m3	Mesh[T][S]Sparse	2312.7	7.2	24.1
uint4	[T][S]Sparse	2301.9	17.9	24.3
fp8e5m2	Mesh[T][S]Sparse	2284.7	11.5	22.6
uintptr	Mesh[T][S]Sparse	2241.8	21.3	25.2
fp4	Mesh[T]	2092.0	0.0	24.6
int2	Mesh[T]	2072.5	0.0	24.9
uint2	Step[T][S]Sparse	1946.5	0.3	24.7
nf4	Mesh[T]	1932.8	0.0	24.8
uint3	Step[T][S]Sparse	1538.3	0.4	22.7
uint5	Mesh[T]	1268.3	0.0	24.8
fp6	Mesh[T]	1235.0	0.0	24.8
int3	Step[T][S]Sparse	1210.2	24.0	21.9
int5	[T][S]Sparse	1127.0	14.2	23.1
uint6	Mesh[T]	1110.1	0.0	24.0
int6	Mesh[T]	1031.3	0.0	24.2

Leaderboard (Lucy Score)

#	Cell	Score	Soft	Acc	Thru	Avail
1	dense|float32|Mesh[T][S]Sparse|lr=0.02	3777.1	7.2	24.8	35354.0	43.0
2	dense|float64|Mesh[T][S]Sparse|lr=0.02	3611.0	6.8	25.6	32252.3	43.8
3	dense|float64|Step[T][S]Sparse|lr=0.02	3501.3	10.3	25.2	32731.9	42.4
4	dense|float64|[T][S]Sparse|lr=0.02	3468.7	3.0	26.0	32181.9	41.5
5	dense|float64|Mesh[T][S]Sparse|lr=2	3426.3	0.0	24.6	30537.3	45.7
6	dense|float64|[T][S]Sparse|lr=2k	3286.7	0.0	24.8	28859.8	46.0
7	dense|float64|[T][S]Sparse|lr=2	3259.7	0.0	24.5	29725.8	44.7
8	dense|float64|Step[T][S]Sparse|lr=2k	3259.3	0.0	24.6	31206.1	42.5
9	dense|float32|Mesh[T][S]Sparse|lr=2	3236.9	0.0	24.7	30038.4	43.7
10	dense|int64|[T][S]Sparse|lr=0.02	3153.6	3.1	26.7	23241.8	50.9
11	dense|float64|Step[T][S]Sparse|lr=200	3078.1	0.0	24.1	27470.7	46.6
12	dense|complex128|Mesh[T][S]Sparse|lr=0.02	2999.9	3.8	26.2	20636.7	55.4
13	dense|float64|Step[T][S]Sparse|lr=2	2995.7	0.0	24.2	28156.4	44.0
14	dense|float32|[T][S]Sparse|lr=0.02	2980.2	3.5	24.9	44673.7	26.8

15	dense|float64|Mesh[T][S]Sparse|lr=2k	2980.2	0.0	24.5	30590.6	39.7
16	dense|complex64|Mesh[T][S]Sparse|lr=0.02	2927.5	3.1	25.8	21277.3	53.3
17	dense|uint16|Mesh[T][S]Sparse|lr=0.02	2925.6	21.1	24.6	21070.2	56.4
18	dense|uint16|[T][S]Sparse|lr=0.02	2924.2	21.4	24.8	21505.8	54.9
19	dense|int8|Mesh[T][S]Sparse|lr=0.02	2867.9	23.2	24.2	22793.3	52.0
20	dense|complex128|[T][S]Sparse|lr=0.02	2848.7	13.7	26.8	20513.9	51.8

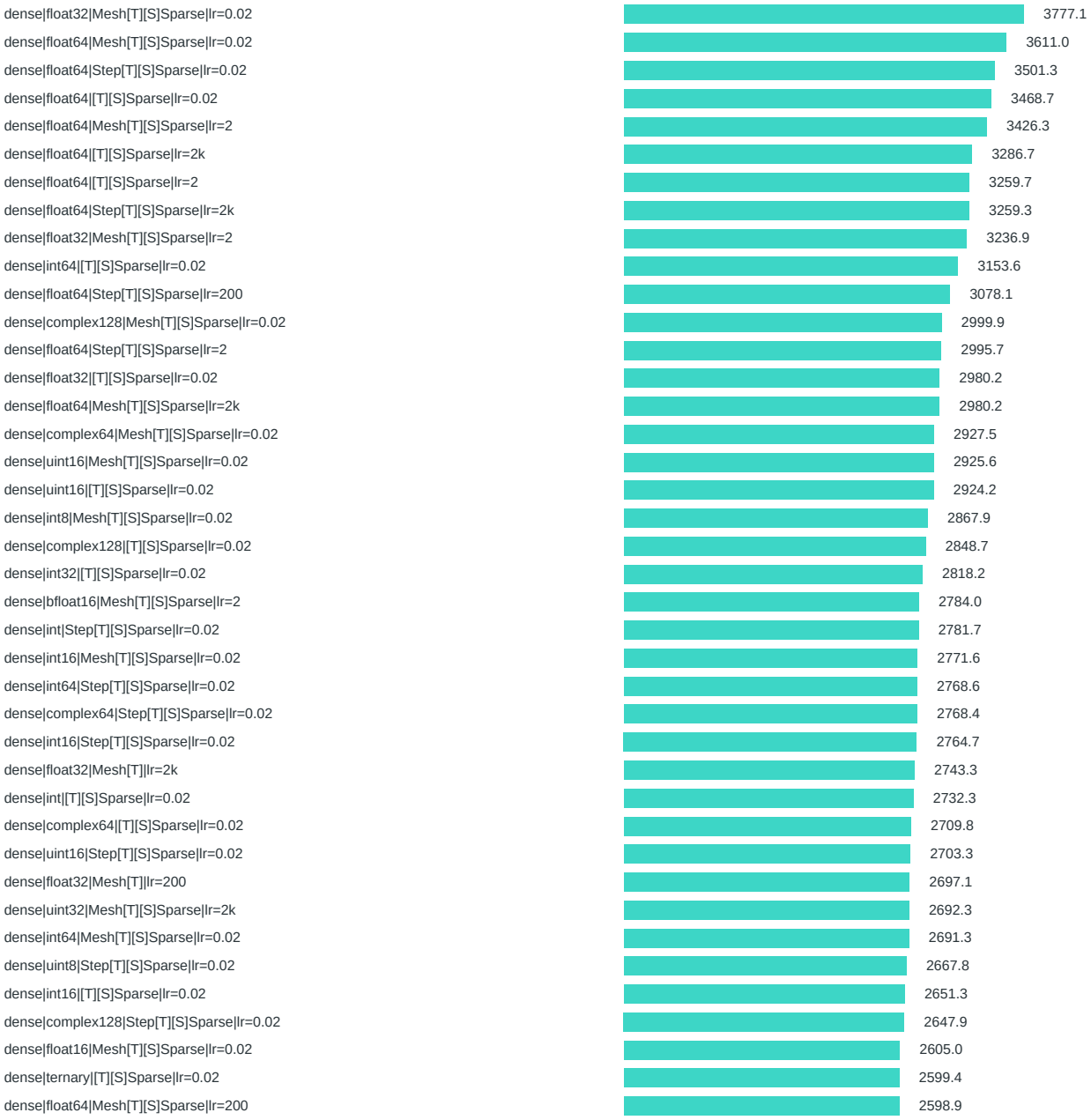
Leaderboard (SoftAcc)

#	Cell	Score	Soft	Acc	Thru	Avail
1	dense|uint8|Step[T][S]Sparse|lr=0.02	2667.8	25.8	24.3	21758.0	50.4
2	dense|ternary|[T][S]Sparse|lr=0.02	2599.4	23.3	24.0	19520.6	55.5
3	dense|int8|Mesh[T][S]Sparse|lr=0.02	2867.9	23.2	24.2	22793.3	52.0
4	dense|uint16|Step[T][S]Sparse|lr=0.02	2703.3	21.8	24.8	21053.4	51.8
5	dense|int32|[T][S]Sparse|lr=0.02	2818.2	21.6	0.4	20959.2	52.6
6	dense|uint16|[T][S]Sparse|lr=0.02	2924.2	21.4	24.8	21505.8	54.9
7	dense|int16|Step[T][S]Sparse|lr=0.02	2764.7	21.4	0.8	22144.9	49.6
8	dense|int16|[T][S]Sparse|lr=0.02	2651.3	21.2	24.2	22368.5	49.0
9	dense|int16|Mesh[T][S]Sparse|lr=0.02	2771.6	21.2	24.3	21771.4	52.4
10	dense|uint16|Mesh[T][S]Sparse|lr=0.02	2925.6	21.1	24.6	21070.2	56.4
11	dense|float16|Mesh[T][S]Sparse|lr=0.02	2605.0	18.9	28.3	17974.7	51.2
12	dense|complex64|Step[T][S]Sparse|lr=0.02	2768.4	14.3	27.7	19015.4	52.6
13	dense|complex128|[T][S]Sparse|lr=0.02	2848.7	13.7	26.8	20513.9	51.8
14	dense|float64|Step[T][S]Sparse|lr=0.02	3501.3	10.3	25.2	32731.9	42.4
15	dense|int64|Step[T][S]Sparse|lr=0.02	2768.6	10.0	25.7	21919.5	49.1
16	dense|complex64|[T][S]Sparse|lr=0.02	2709.8	9.0	25.5	20801.4	51.1
17	dense|int|[T][S]Sparse|lr=0.02	2732.3	7.3	25.7	19937.4	53.2
18	dense|float32|Mesh[T][S]Sparse|lr=0.02	3777.1	7.2	24.8	35354.0	43.0
19	dense|float64|Mesh[T][S]Sparse|lr=0.02	3611.0	6.8	25.6	32252.3	43.8
20	dense|int|Step[T][S]Sparse|lr=0.02	2781.7	6.4	25.2	18767.2	58.7

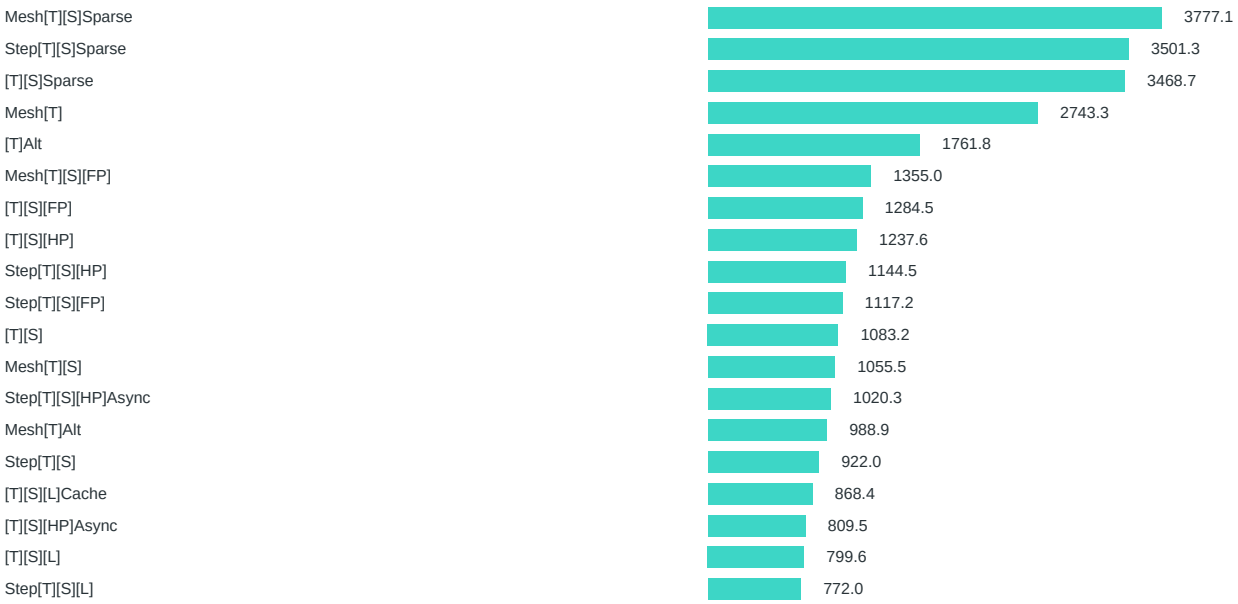
Leaderboard (hard Acc)

#	Cell	Score	Soft	Acc	Thru	Avail
1	dense|float16|Mesh[T][S]Sparse|lr=0.02	2605.0	18.9	28.3	17974.7	51.2
2	dense|complex64|Step[T][S]Sparse|lr=0.02	2768.4	14.3	27.7	19015.4	52.6
3	dense|complex128|[T][S]Sparse|lr=0.02	2848.7	13.7	26.8	20513.9	51.8
4	dense|int64|[T][S]Sparse|lr=0.02	3153.6	3.1	26.7	23241.8	50.9
5	dense|complex128|Mesh[T][S]Sparse|lr=0.02	2999.9	3.8	26.2	20636.7	55.4
6	dense|complex128|Step[T][S]Sparse|lr=0.02	2647.9	3.9	26.0	19691.7	51.7
7	dense|float64|[T][S]Sparse|lr=0.02	3468.7	3.0	26.0	32181.9	41.5
8	dense|complex64|Mesh[T][S]Sparse|lr=0.02	2927.5	3.1	25.8	21277.3	53.3
9	dense|int|[T][S]Sparse|lr=0.02	2732.3	7.3	25.7	19937.4	53.2
10	dense|int64|Step[T][S]Sparse|lr=0.02	2768.6	10.0	25.7	21919.5	49.1
11	dense|float64|Mesh[T][S]Sparse|lr=0.02	3611.0	6.8	25.6	32252.3	43.8
12	dense|complex64|[T][S]Sparse|lr=0.02	2709.8	9.0	25.5	20801.4	51.1
13	dense|int|Step[T][S]Sparse|lr=0.02	2781.7	6.4	25.2	18767.2	58.7
14	dense|float64|Step[T][S]Sparse|lr=0.02	3501.3	10.3	25.2	32731.9	42.4
15	dense|float32|[T][S]Sparse|lr=0.02	2980.2	3.5	24.9	44673.7	26.8
16	dense|float32|Mesh[T][S]Sparse|lr=0.02	3777.1	7.2	24.8	35354.0	43.0
17	dense|uint16|Step[T][S]Sparse|lr=0.02	2703.3	21.8	24.8	21053.4	51.8
18	dense|float64|[T][S]Sparse|lr=2k	3286.7	0.0	24.8	28859.8	46.0
19	dense|uint16|[T][S]Sparse|lr=0.02	2924.2	21.4	24.8	21505.8	54.9
20	dense|float32|Mesh[T]|lr=2k	2743.3	0.0	24.7	26954.9	41.2

Top scores



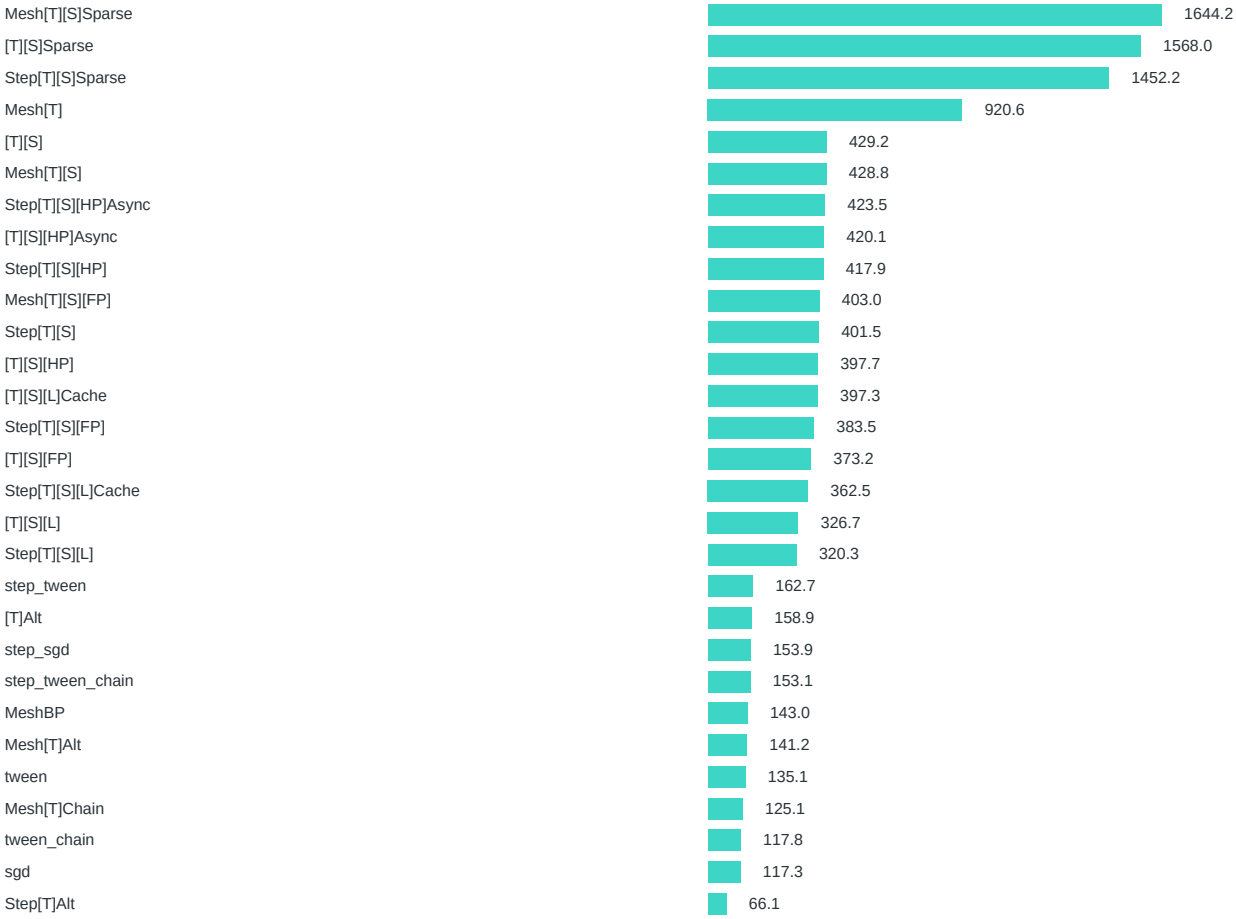
Best settings per mode



Best settings per mode



Mean Score by train mode



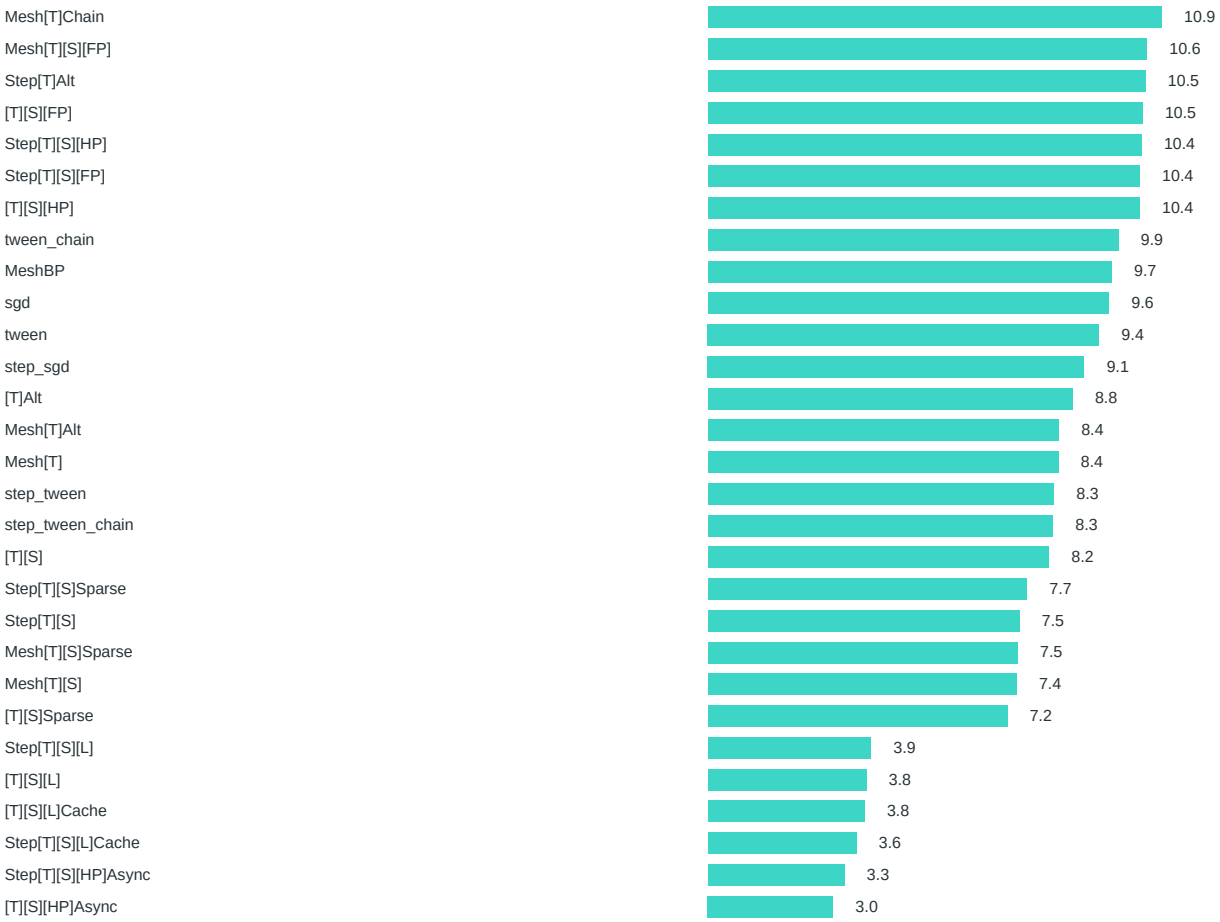
Mean hard Acc by train mode



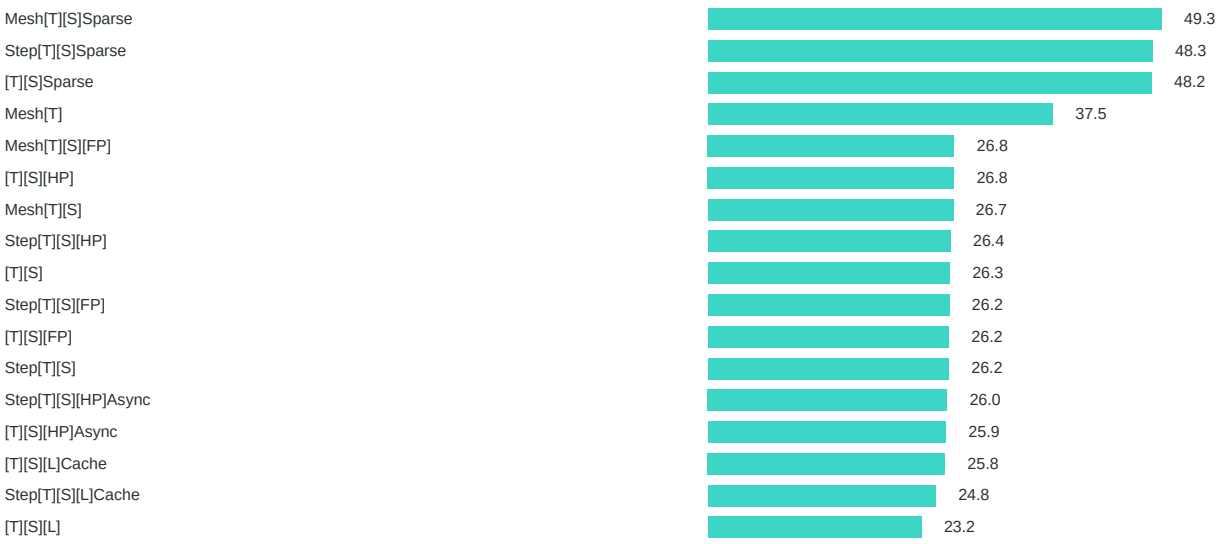
Mean hard Acc by train mode



Mean SoftAcc by train mode



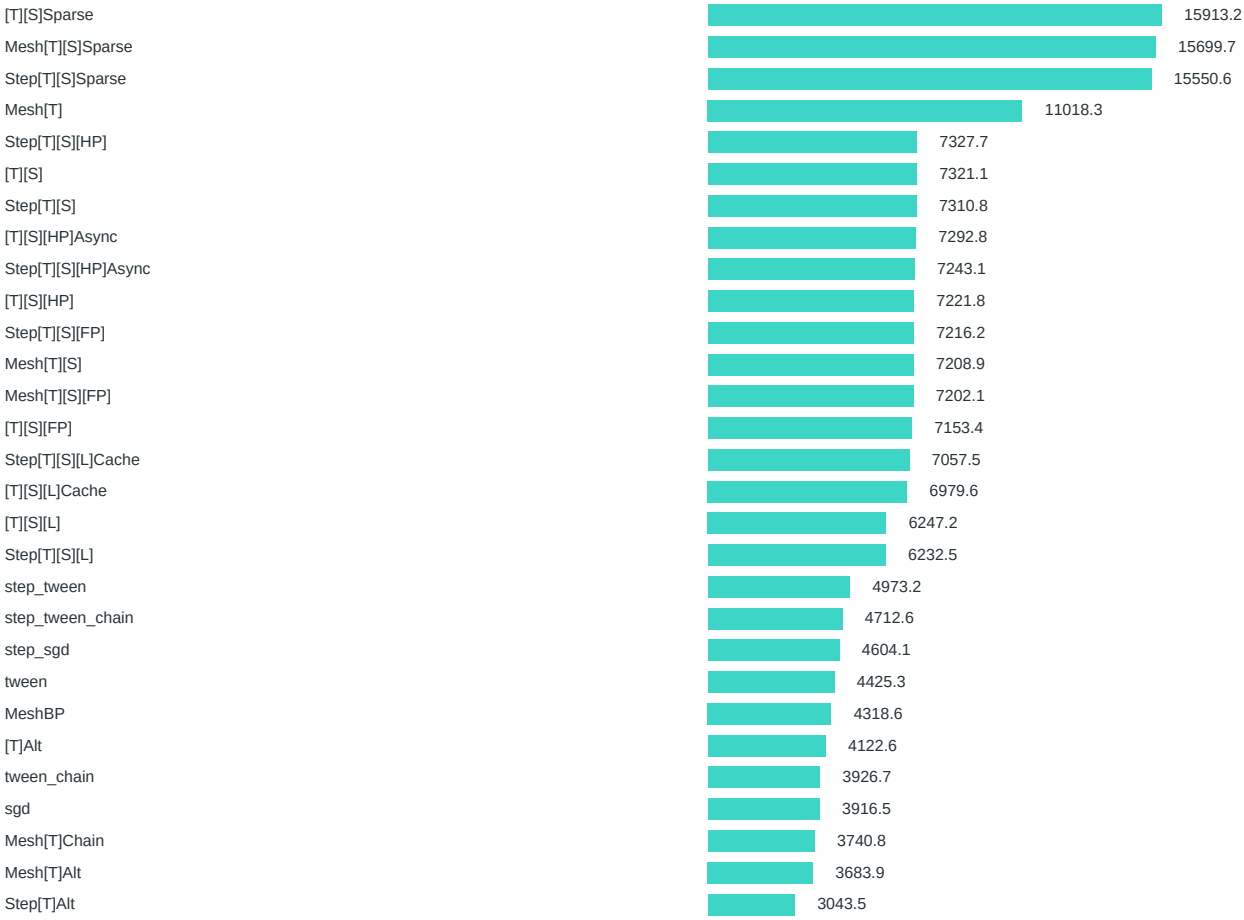
Mean Availability by train mode



Mean Availability by train mode



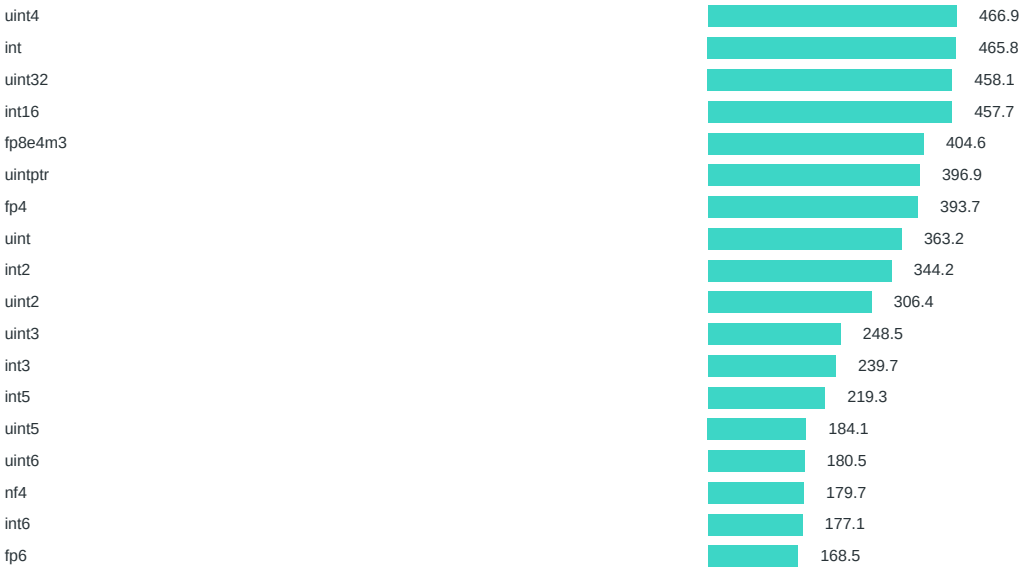
Mean Throughput by train mode



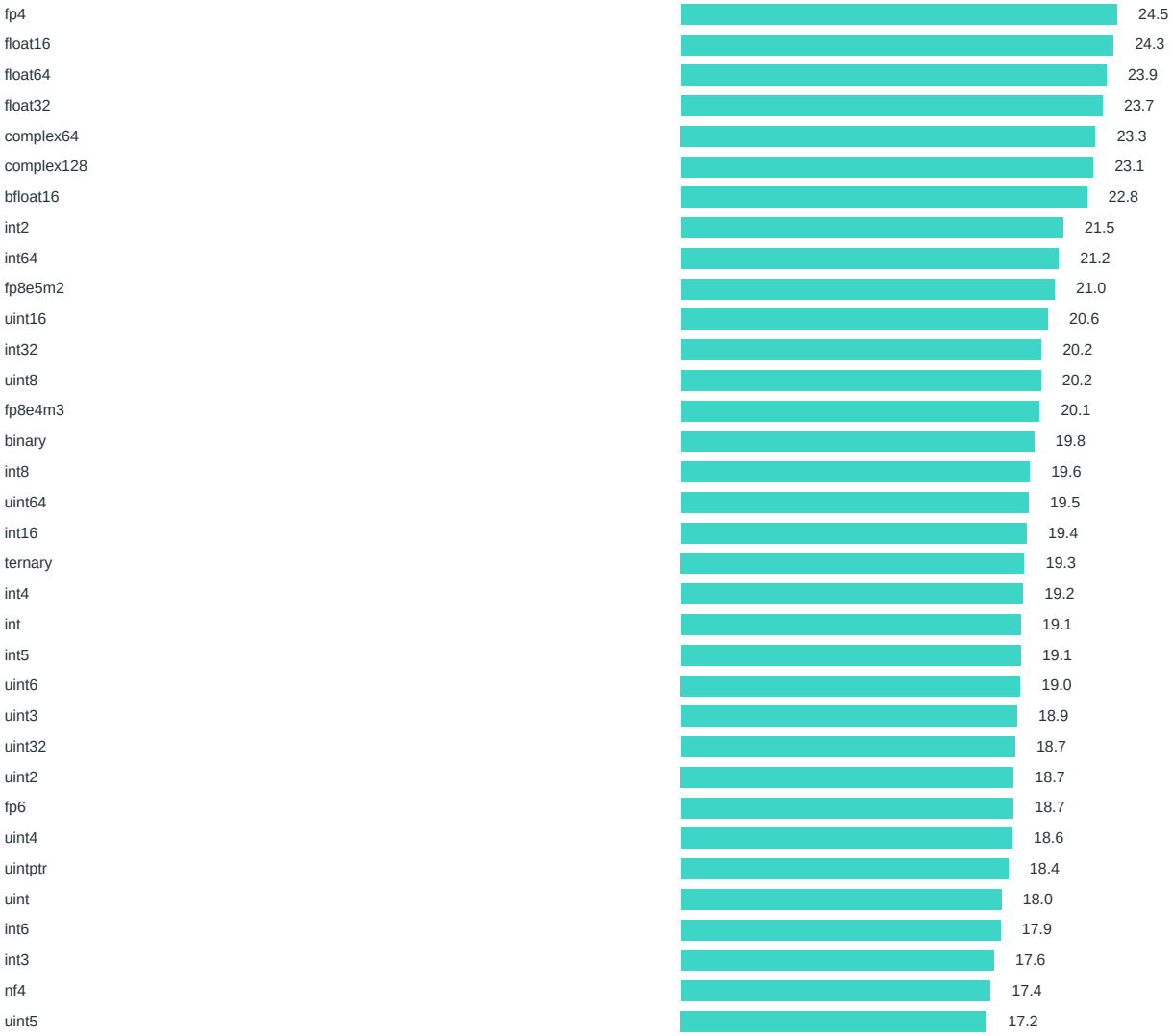
Mean Score by dtype



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	190	191	128	284	258	205	294	156	77	134	138	171
Mesh[T]	829	967	1107	1005	884	1949	1394	1634	663	498	904	745
Mesh[T]Alt	409	48	386	313	364	858	806	53	27	67	319	33
Mesh[T]Chain	198	131	209	198	254	260	327	362	50	96	193	179
Mesh[T][S]	635	518	615	535	713	785	858	282	216	351	453	568
Mesh[T][S][FP]	591	587	433	722	653	831	867	277	149	204	521	403
Mesh[T][S]Sparse	2293	2394	2110	2191	2097	2922	3154	1464	511	1476	2075	1733
Step[T]Alt	58	96	96	77	84	79	113	57	22	70	12	89
Step[T][S]	566	366	681	656	671	435	716	221	278	326	533	408
Step[T][S][FP]	641	448	457	635	702	439	791	321	145	393	441	501
Step[T][S][HP]	587	549	734	727	731	401	782	334	176	414	472	430
Step[T][S][HP]Async	592	510	563	608	616	490	715	277	198	441	543	511
Step[T][S][L]	456	244	423	443	512	396	632	251	111	218	408	311
Step[T][S][L]Cache	420	412	482	487	498	342	556	290	196	471	381	542
Step[T][S]Sparse	2155	1396	2014	2159	2028	2121	3209	1419	301	1701	2044	1511
[T]Alt	399	47	396	370	276	1477	812	70	19	67	297	56
[T][S]	655	540	626	658	646	547	770	226	127	590	509	197
[T][S][FP]	690	370	466	401	654	508	836	264	164	286	516	520
[T][S][HP]	612	541	479	464	744	503	833	269	175	452	543	432
[T][S][HP]Async	607	467	575	552	650	470	644	276	113	426	448	453
[T][S][L]	402	227	452	458	334	402	563	285	133	317	507	324
[T][S][L]Cache	430	395	491	386	483	374	555	282	210	324	400	537
[T][S]Sparse	2203	2090	1974	2186	2249	2358	3100	1399	519	1550	1973	1958
sgd	147	171	141	122	134	120	189	149	66	108	144	95
step_sgd	215	305	321	160	163	171	223	197	24	183	228	177
step_tween	240	256	155	228	111	323	356	152	66	111	128	167
step_tween_chain	225	155	292	176	262	328	225	177	47	186	193	134
tween	171	180	170	145	130	213	205	133	50	127	49	224
tween_chain	189	107	131	122	238	146	176	142	56	145	115	98

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	177	179	60	80	174	49	60	217	154	73	153	96
Mesh[T]	876	1593	869	707	1270	635	440	1004	1316	609	1266	592
Mesh[T]Alt	77	55	30	32	94	24	15	83	69	34	61	22
Mesh[T]Chain	108	67	46	91	133	46	18	223	153	26	125	38
Mesh[T][S]	477	282	124	587	459	325	172	594	367	80	322	487
Mesh[T][S][FP]	412	432	139	395	550	189	188	327	568	88	541	360
Mesh[T][S]Sparse	1938	940	877	1303	1767	798	729	2104	1846	743	1731	1479
Step[T]Alt	58	45	39	80	62	40	39	113	101	24	69	74
Step[T][S]	352	339	201	444	356	215	161	659	681	105	400	580
Step[T][S][FP]	401	280	198	487	505	184	160	497	352	93	384	155
Step[T][S][HP]	638	273	237	909	191	240	183	601	476	61	512	505
Step[T][S][HP]Async	460	361	211	544	483	247	127	475	500	199	497	451
Step[T][S][L]	337	256	157	513	328	147	103	437	451	129	353	333
Step[T][S][L]Cache	536	320	238	567	436	203	181	584	510	132	435	291
Step[T][S]Sparse	1124	717	896	1725	1746	633	555	2267	1599	595	1618	972
[T]Alt	82	26	35	65	59	24	26	82	73	38	102	81
[T][S]	438	422	195	485	453	228	79	579	463	248	476	436
[T][S][FP]	298	252	273	491	489	182	129	594	395	121	410	358
[T][S][HP]	455	313	232	730	377	185	137	448	404	101	389	345
[T][S][HP]Async	521	338	313	585	571	171	244	538	421	175	494	430
[T][S][L]	412	370	121	382	351	142	171	441	380	183	326	275
[T][S][L]Cache	344	296	160	381	496	224	172	671	523	133	568	425
[T][S]Sparse	1764	1067	891	1113	1633	857	674	2278	1166	796	1338	1050
sgd	229	140	58	127	92	54	66	159	65	58	141	98
step_sgd	75	153	93	93	174	78	43	261	142	86	212	124
step_tween	204	94	112	214	218	60	61	282	196	48	259	139
step_tween_chain	129	124	44	244	174	50	82	227	157	88	223	214
tween	174	127	42	171	146	47	51	167	214	89	177	66
tween_chain	176	116	61	178	120	82	70	126	135	55	128	57

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	212	111	56	194	144	76	35	112	146	80
Mesh[T]	841	946	676	654	963	633	485	949	805	481
Mesh[T]Alt	61	28	17	89	80	25	23	102	57	40
Mesh[T]Chain	74	68	57	112	61	34	64	63	135	58
Mesh[T][S]	315	284	376	470	480	188	227	243	569	625
Mesh[T][S][FP]	370	270	255	432	243	147	202	676	401	279
Mesh[T][S]Sparse	2083	850	932	2218	2747	629	588	1996	1717	1468
Step[T]Alt	105	39	28	82	65	22	25	131	101	57
Step[T][S]	326	378	135	447	416	174	146	465	405	408
Step[T][S][FP]	689	248	275	193	407	166	121	583	413	335
Step[T][S][HP]	251	303	77	373	508	135	155	387	715	137
Step[T][S][HP]Async	480	263	259	507	533	246	200	476	391	423
Step[T][S][L]	437	215	165	361	337	163	121	442	385	319
Step[T][S][L]Cache	398	259	82	365	328	74	156	360	328	463
Step[T][S]Sparse	2082	1185	1242	1347	1375	559	726	1306	1928	1123
[T]Alt	52	46	21	40	63	31	27	33	56	53
[T][S]	571	287	240	460	445	222	169	578	582	445
[T][S][FP]	396	285	124	332	449	148	201	359	415	315
[T][S][HP]	618	293	183	377	220	144	177	436	545	365
[T][S][HP]Async	459	368	235	492	410	240	188	489	524	398
[T][S][L]	512	213	154	364	379	187	121	450	405	364
[T][S][L]Cache	552	386	216	526	499	221	176	384	810	475
[T][S]Sparse	2009	1017	920	1923	1511	540	525	2543	2094	2044
sgd	138	103	64	133	129	63	50	114	128	193
step_sgd	251	62	105	116	177	45	67	204	128	179
step_tween	219	74	93	222	98	62	82	126	234	142
step_tween_chain	99	124	44	116	181	37	43	172	174	60
tween	216	68	62	231	160	79	76	149	165	120
tween_chain	141	110	113	109	132	46	61	63	180	83

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	24	23	18	29	31	18	23	25	19	20	19	18
Mesh[T]	16	23	21	18	14	23	21	24	23	20	19	18
Mesh[T]Alt	25	15	26	29	29	27	26	31	27	25	24	12
Mesh[T]Chain	25	22	21	23	33	19	32	25	19	19	24	20
Mesh[T][S]	24	22	26	26	26	25	25	30	23	19	22	24
Mesh[T][S][FP]	24	24	19	28	27	26	26	25	17	11	23	17
Mesh[T][S]Sparse	23	27	24	24	25	25	25	24	15	17	24	22
Step[T]Alt	12	21	21	19	16	16	17	24	11	20	5	23
Step[T][S]	24	16	26	25	26	25	26	18	25	17	24	17
Step[T][S][FP]	24	21	19	27	28	26	26	25	17	22	18	21
Step[T][S][HP]	24	22	31	28	27	26	26	25	17	23	20	17
Step[T][S][HP]Async	24	21	24	26	26	25	25	24	22	23	23	22
Step[T][S][L]	24	15	26	26	27	25	25	24	21	16	25	23
Step[T][S][L]Cache	24	18	25	24	24	25	24	24	22	23	23	24
Step[T][S]Sparse	24	17	24	25	25	24	24	24	9	21	24	17
[T]Alt	24	15	28	28	27	27	26	24	17	22	23	16
[T][S]	25	22	26	26	26	26	25	20	17	27	21	8
[T][S][FP]	24	13	19	19	27	26	27	24	22	17	24	22
[T][S][HP]	24	21	19	19	28	27	27	25	24	22	22	17
[T][S][HP]Async	24	21	25	24	26	25	25	25	10	22	22	21
[T][S][L]	23	13	25	26	18	25	26	25	23	24	31	19
[T][S][L]Cache	24	17	24	24	24	24	24	24	27	16	23	24
[T][S]Sparse	24	22	25	25	25	24	25	24	16	18	23	24
sgd	23	21	18	18	18	18	18	25	25	16	21	17
step_sgd	22	29	31	18	18	19	18	24	7	22	24	18
step_tween	21	22	13	16	9	23	25	24	19	16	14	15
step_tween_chain	22	18	30	19	28	31	19	24	12	24	21	17
tween	16	20	17	16	13	18	17	25	19	17	6	24
tween_chain	24	14	19	19	31	19	19	24	18	24	18	15

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	22	17	11	18	12	20	18	17	23	17	18
Mesh[T]	21	28	24	12	22	18	14	24	29	19	22	13
Mesh[T]Alt	23	24	19	16	30	17	15	23	17	27	16	10
Mesh[T]Chain	18	19	16	18	19	16	7	20	24	7	17	9
Mesh[T][S]	22	23	11	30	20	29	18	23	18	11	14	24
Mesh[T][S][FP]	16	29	12	17	23	22	23	13	23	9	20	16
Mesh[T][S]Sparse	20	16	18	15	18	22	19	20	19	17	20	19
Step[T]Alt	15	18	23	19	16	19	21	24	19	18	16	21
Step[T][S]	16	20	16	20	17	20	20	25	29	12	17	31
Step[T][S][FP]	17	22	17	21	21	21	22	18	18	12	17	10
Step[T][S][HP]	27	20	16	35	12	23	18	27	18	8	23	24
Step[T][S][HP]Async	22	23	17	23	22	23	11	18	23	23	21	25
Step[T][S][L]	17	21	20	26	20	20	15	23	23	21	16	24
Step[T][S][L]Cache	24	19	19	23	20	22	20	24	23	17	21	16
Step[T][S]Sparse	13	12	19	19	20	16	15	24	19	17	19	14
[T]Alt	26	15	20	21	19	18	29	18	17	23	28	29
[T][S]	19	30	18	19	20	22	10	22	18	27	21	22
[T][S][FP]	12	21	24	23	21	16	17	22	17	15	18	17
[T][S][HP]	22	24	18	29	17	20	18	17	17	12	16	17
[T][S][HP]Async	24	21	22	24	23	18	23	23	20	22	21	24
[T][S][L]	23	30	19	24	21	19	23	23	23	28	17	18
[T][S][L]Cache	17	21	17	16	22	24	16	24	23	16	23	22
[T][S]Sparse	19	17	19	14	17	19	20	23	13	20	15	14
sgd	27	24	13	16	13	20	20	18	9	16	18	15
step_sgd	8	21	15	10	20	14	11	25	19	18	24	14
step_tween	17	17	22	20	18	15	18	22	20	13	22	15
step_tween_chain	13	20	10	24	17	13	17	19	16	16	21	20
tween	18	22	12	17	15	14	17	16	23	23	21	10
tween_chain	21	23	18	25	17	21	23	18	15	16	17	11

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	21	17	16	21	16	17	11	14	15	12
Mesh[T]	18	24	22	12	23	24	18	23	20	13
Mesh[T]Alt	20	17	11	22	21	18	24	28	18	17
Mesh[T]Chain	17	16	18	18	11	11	21	10	27	12
Mesh[T][S]	14	18	27	20	21	18	21	11	22	31
Mesh[T][S][FP]	18	22	24	19	12	16	25	26	17	12
Mesh[T][S]Sparse	21	15	19	23	30	15	16	22	19	20
Step[T]Alt	20	16	16	20	15	14	20	24	21	16
Step[T][S]	15	28	14	19	19	22	16	24	18	21
Step[T][S][FP]	27	17	21	8	17	20	13	26	16	17
Step[T][S][HP]	13	22	7	17	21	12	19	17	29	7
Step[T][S][HP]Async	24	15	25	24	23	23	17	23	19	24
Step[T][S][L]	24	20	20	23	23	23	19	24	20	25
Step[T][S][L]Cache	20	15	9	18	14	10	23	17	14	22
Step[T][S]Sparse	23	18	29	15	16	14	23	16	22	15
[T]Alt	21	21	17	12	21	21	19	10	20	21
[T][S]	25	21	22	23	19	21	19	24	25	22
[T][S][FP]	19	23	14	17	21	13	28	17	18	17
[T][S][HP]	26	25	16	17	13	12	24	17	23	17
[T][S][HP]Async	22	22	21	24	18	23	18	23	24	18
[T][S][L]	26	16	21	22	22	22	21	23	21	24
[T][S][L]Cache	24	25	20	21	21	22	18	20	30	24
[T][S]Sparse	20	17	22	23	19	13	16	29	22	27
sgd	19	17	18	17	17	18	17	15	15	28
step_sgd	24	10	23	12	20	11	17	20	13	18
step_tween	21	16	21	19	11	15	20	11	20	15
step_tween_chain	11	18	10	12	19	9	11	20	17	9
tween	22	12	17	30	17	25	22	18	18	16
tween_chain	19	20	26	17	18	14	17	11	22	12

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

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

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	14	11	8	13	10	9	9	13	10	14
Mesh[T]	7	3	12	11	14	16	13	13	10	21
Mesh[T]Alt	12	7	5	12	11	10	10	13	12	13
Mesh[T]Chain	15	13	9	15	10	10	13	15	10	16
Mesh[T][S]	8	5	12	9	11	13	14	9	8	10
Mesh[T][S][FP]	14	13	13	13	12	11	13	13	9	13
Mesh[T][S]Sparse	9	9	13	9	7	10	10	9	10	9
Step[T]Alt	10	16	14	11	13	19	16	10	10	12
Step[T][S]	9	9	10	9	9	10	13	9	8	9
Step[T][S][FP]	13	15	10	13	12	12	14	13	10	14
Step[T][S][HP]	13	13	13	13	11	12	13	13	11	13
Step[T][S][HP]Async	2	1	7	2	3	9	8	2	3	1
Step[T][S][L]	3	10	1	3	5	6	4	3	4	3
Step[T][S][L]Cache	3	7	4	3	5	9	6	2	3	3
Step[T][S]Sparse	9	6	13	9	10	9	9	9	10	9
[T]Alt	12	5	9	13	10	9	12	13	11	13
[T][S]	9	12	12	10	9	15	11	9	11	10
[T][S][FP]	13	11	10	13	14	15	12	13	11	13
[T][S][HP]	13	12	10	13	12	13	14	13	11	13
[T][S][HP]Async	1	3	1	1	2	7	7	2	1	2
[T][S][L]	3	1	6	3	6	6	4	3	4	3
[T][S][L]Cache	2	11	10	2	5	6	3	4	3	2
[T][S]Sparse	9	7	12	9	10	7	7	9	10	10
sgd	15	11	6	14	9	5	9	15	10	14
step_sgd	14	11	17	11	11	9	9	11	10	11
step_tween	9	11	9	7	9	12	15	9	10	10
step_tween_chain	11	7	6	11	9	9	9	12	9	11
tween	9	7	10	11	12	16	17	11	11	11
tween_chain	14	10	9	14	7	9	8	14	11	14

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	16	17	18	20	17	15	16	15	19	16	17	21
Mesh[T]	37	37	38	38	42	34	30	44	38	31	38	35
Mesh[T]Alt	23	10	24	18	21	21	22	8	11	11	21	13
Mesh[T]Chain	17	16	21	20	18	15	15	22	16	16	18	20
Mesh[T][S]	30	29	31	24	31	24	25	17	27	25	26	31
Mesh[T][S][FP]	27	29	30	32	28	23	24	20	26	27	29	31
Mesh[T][S]Sparse	55	49	52	54	49	41	43	42	49	50	51	52
Step[T]Alt	15	14	14	13	14	7	12	9	14	12	11	13
Step[T][S]	27	28	32	32	30	12	21	20	31	26	28	29
Step[T][S][FP]	31	26	32	29	29	12	22	22	25	28	29	34
Step[T][S][HP]	27	29	29	31	30	10	22	23	27	25	30	33
Step[T][S][HP]Async	29	29	31	29	27	14	21	20	25	27	31	32
Step[T][S][L]	26	24	24	25	27	13	21	17	19	21	24	21
Step[T][S][L]Cache	23	25	29	29	28	11	20	19	26	29	24	29
Step[T][S]Sparse	49	48	52	53	49	25	44	40	48	51	54	54
[T]Alt	22	11	24	23	20	19	23	12	9	12	20	14
[T][S]	29	30	30	29	28	15	23	19	22	31	31	33
[T][S][FP]	32	33	32	30	28	14	23	19	23	25	28	31
[T][S][HP]	27	30	33	33	31	12	23	19	25	28	31	34
[T][S][HP]Async	29	26	28	29	29	13	20	20	30	28	28	29
[T][S][L]	23	23	27	25	27	12	19	20	20	22	27	26
[T][S][L]Cache	24	30	29	24	28	13	21	19	25	28	27	29
[T][S]Sparse	51	53	51	55	51	26	42	39	45	51	51	53
sgd	15	18	20	17	16	8	15	15	14	17	17	15
step_sgd	19	21	21	19	19	9	15	19	14	19	20	24
step_tween	20	20	21	24	22	13	16	13	17	16	20	22
step_tween_chain	19	18	21	20	17	9	15	17	16	17	19	20
tween	20	17	21	20	21	12	16	12	15	19	19	21
tween_chain	18	17	19	17	17	9	14	15	17	17	17	19

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	17	19	15	17	20	18	13	22	19	10	20	18
Mesh[T]	36	43	42	36	43	40	37	35	36	26	41	34
Mesh[T]Alt	11	10	11	8	11	11	9	10	13	8	12	11
Mesh[T]Chain	16	12	14	14	17	14	14	19	17	12	18	15
Mesh[T][S]	25	21	25	26	27	26	26	29	23	19	28	28
Mesh[T][S][FP]	29	24	25	30	28	23	24	27	28	19	32	27
Mesh[T][S]Sparse	53	40	49	51	52	46	49	53	50	39	52	51
Step[T]Alt	11	10	11	12	11	13	14	12	14	8	13	12
Step[T][S]	28	23	27	28	26	27	23	28	26	21	28	26
Step[T][S][FP]	27	21	24	26	28	21	20	29	25	19	29	28
Step[T][S][HP]	27	23	27	29	23	26	30	25	28	17	27	27
Step[T][S][HP]Async	26	22	27	28	26	25	24	28	27	18	29	26
Step[T][S][L]	27	22	21	26	23	22	22	24	26	16	29	23
Step[T][S][L]Cache	25	22	28	29	25	23	25	26	26	18	26	25
Step[T][S]Sparse	48	42	49	53	52	49	51	50	46	36	50	51
[T]Alt	10	9	11	11	8	10	8	12	14	10	12	12
[T][S]	27	22	24	30	27	25	27	29	31	19	29	27
[T][S][FP]	30	21	25	27	27	28	22	30	28	21	28	30
[T][S][HP]	25	22	28	29	26	26	24	29	27	18	29	31
[T][S][HP]Async	27	23	29	31	29	21	28	26	24	18	28	26
[T][S][L]	25	23	18	22	25	22	24	24	23	16	27	27
[T][S][L]Cache	25	21	22	28	26	23	27	28	27	18	29	29
[T][S]Sparse	49	44	49	50	51	50	43	51	51	38	52	50
sgd	19	16	17	18	15	13	17	18	18	13	19	17
step_sgd	19	19	20	19	17	20	18	18	18	14	18	20
step_tween	21	14	18	19	21	16	16	19	18	12	20	20
step_tween_chain	18	16	16	19	19	15	21	21	18	17	21	22
tween	19	16	16	21	20	14	18	20	19	13	17	19
tween_chain	18	14	13	16	16	17	16	15	19	12	19	17

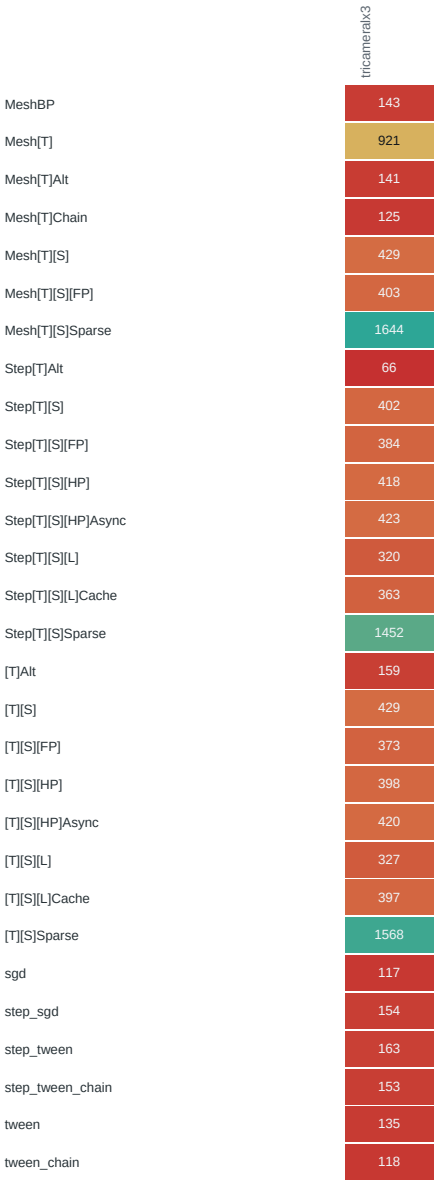
Honesty - mean Avail, every mode x dtype (cols 25-34)

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

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	19	15	17	20	20	20	18	18	20	20
Mesh[T]	40	40	38	37	39	40	39	37	36	34
Mesh[T]Alt	12	8	10	13	14	10	8	12	11	11
Mesh[T]Chain	13	13	15	17	16	17	17	16	13	18
Mesh[T][S]	26	23	29	30	29	26	31	29	31	29
Mesh[T][S][FP]	27	23	25	29	28	24	22	31	29	30
Mesh[T][S]Sparse	53	43	52	55	51	55	52	49	47	50
Step[T]Alt	16	11	12	12	13	12	9	15	14	13
Step[T][S]	29	22	26	28	29	22	25	29	27	27
Step[T][S][FP]	30	22	30	30	30	23	24	25	31	31
Step[T][S][HP]	25	22	22	29	30	30	25	27	30	29
Step[T][S][HP]Async	24	22	25	27	29	28	29	26	27	26
Step[T][S][L]	24	20	24	24	22	23	20	25	27	23
Step[T][S][L]Cache	25	24	24	27	26	23	22	26	27	30
Step[T][S]Sparse	51	45	46	54	51	51	46	52	51	54
[T]Alt	11	9	8	12	12	12	10	12	10	11
[T][S]	25	22	26	25	27	27	25	29	28	27
[T][S][FP]	26	20	22	29	27	28	23	27	27	28
[T][S][HP]	28	21	26	29	26	27	24	28	29	30
[T][S][HP]Async	26	23	25	26	28	28	25	26	25	29
[T][S][L]	26	21	22	24	24	26	20	27	27	25
[T][S][L]Cache	27	26	27	31	29	27	26	24	31	29
[T][S]Sparse	53	45	49	51	48	50	48	46	52	51
sgd	16	16	16	18	19	17	15	17	19	18
step_sgd	18	15	17	21	18	17	19	19	18	21
step_tween	18	12	17	22	20	16	19	20	22	21
step_tween_chain	18	17	18	20	21	18	18	16	19	18
tween	19	16	17	15	21	14	17	18	19	19
tween_chain	16	15	18	17	19	17	20	17	18	19

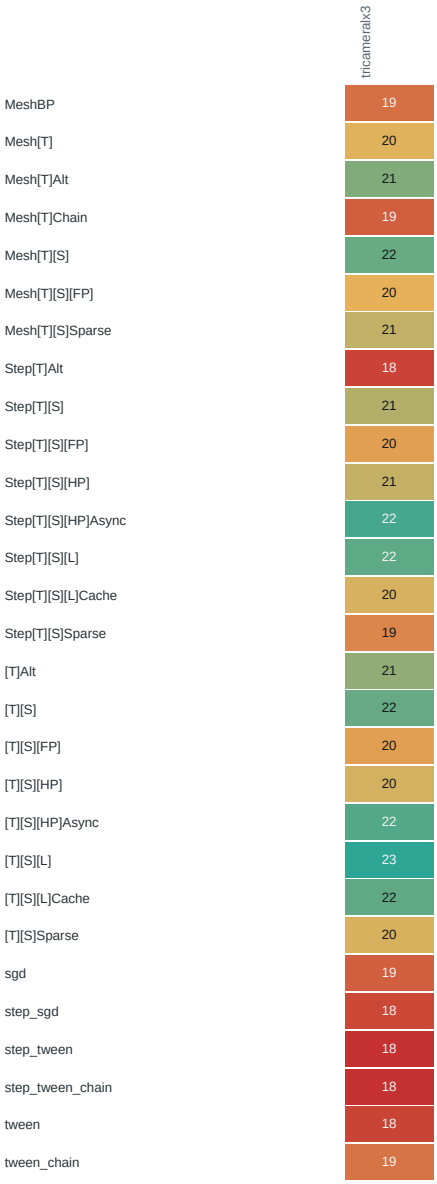
Mean Score, every mode x arch

Mean Score, every mode x arch



Mean hard Acc, every mode x arch

Mean hard Acc, every mode x arch

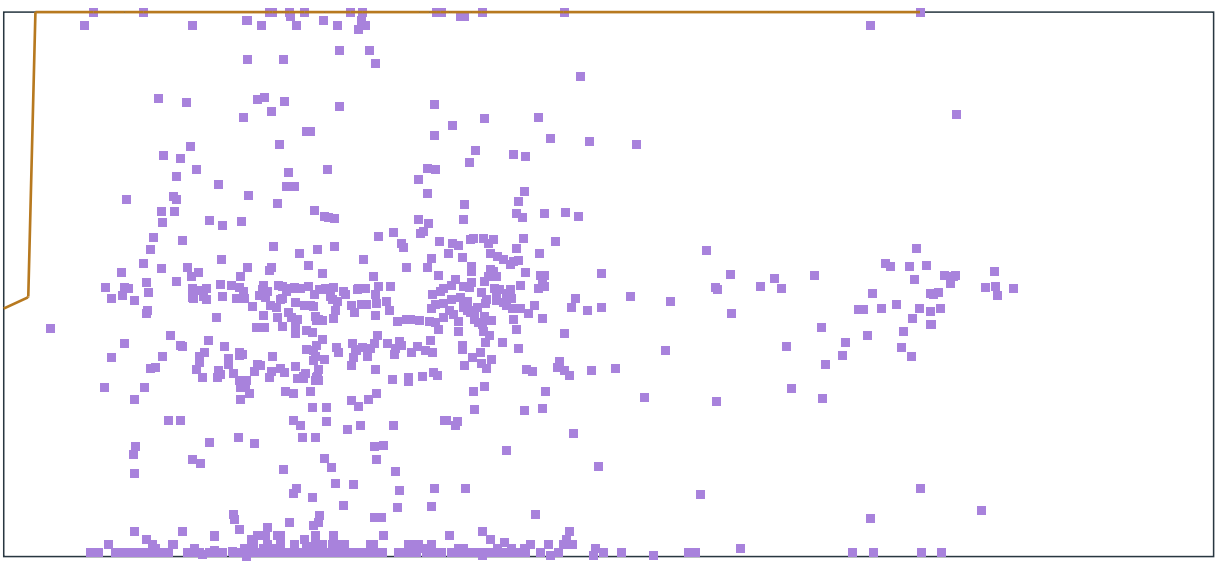


Mean Avail, every mode x arch

Mean Avail, every mode x arch

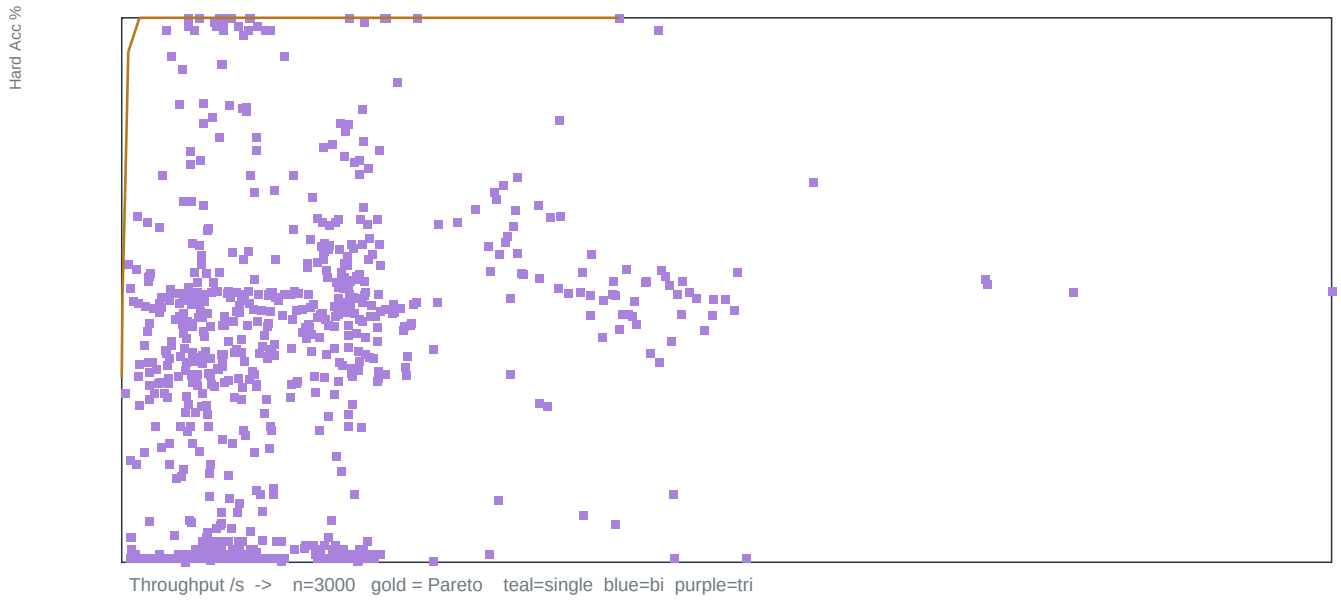
	tricamerarix3
MeshBP	18
Mesh[T]	38
Mesh[T]Alt	13
Mesh[T]Chain	16
Mesh[T][S]	27
Mesh[T][S][FP]	27
Mesh[T][S]Sparse	49
Step[T]Alt	12
Step[T][S]	26
Step[T][S][FP]	26
Step[T][S][HP]	26
Step[T][S][HP]Async	26
Step[T][S][L]	23
Step[T][S][L]Cache	25
Step[T][S]Sparse	48
[T]Alt	13
[T][S]	26
[T][S][FP]	26
[T][S][HP]	27
[T][S][HP]Async	26
[T][S][L]	23
[T][S][L]Cache	26
[T][S]Sparse	48
sgd	16
step_sgd	18
step_tween	18
step_tween_chain	18
tween	18
tween_chain	17

Pillars - Availability vs hard Acc

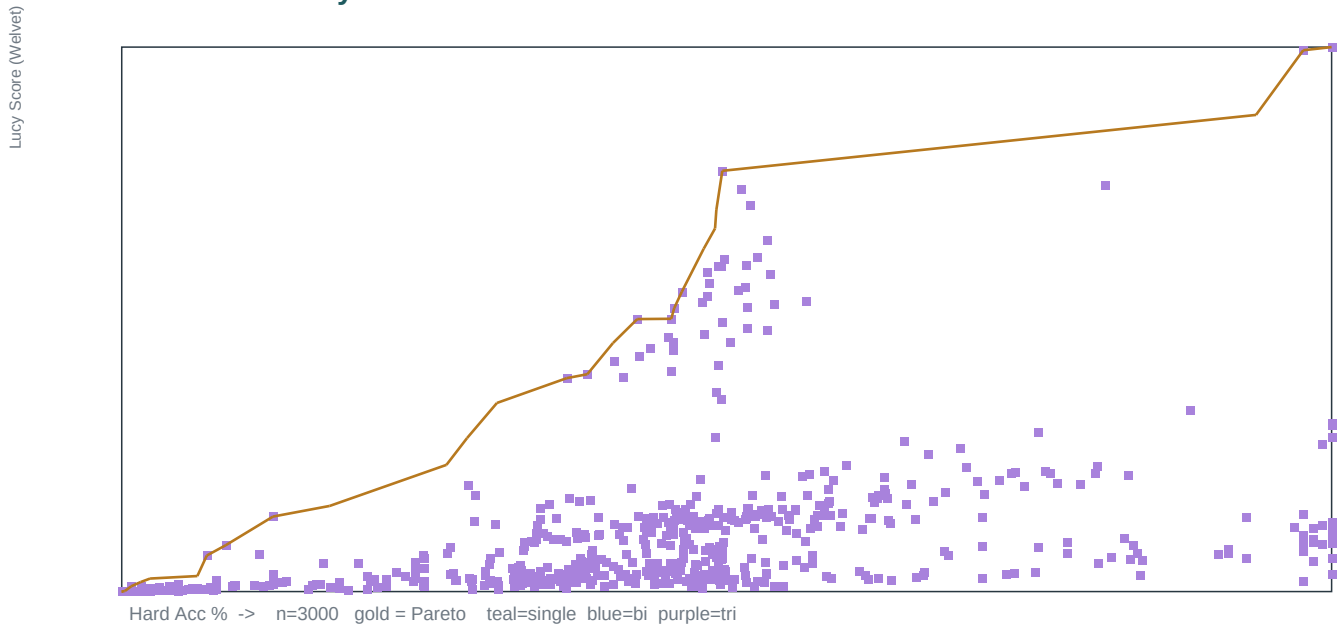



Availability % -> n=3000 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

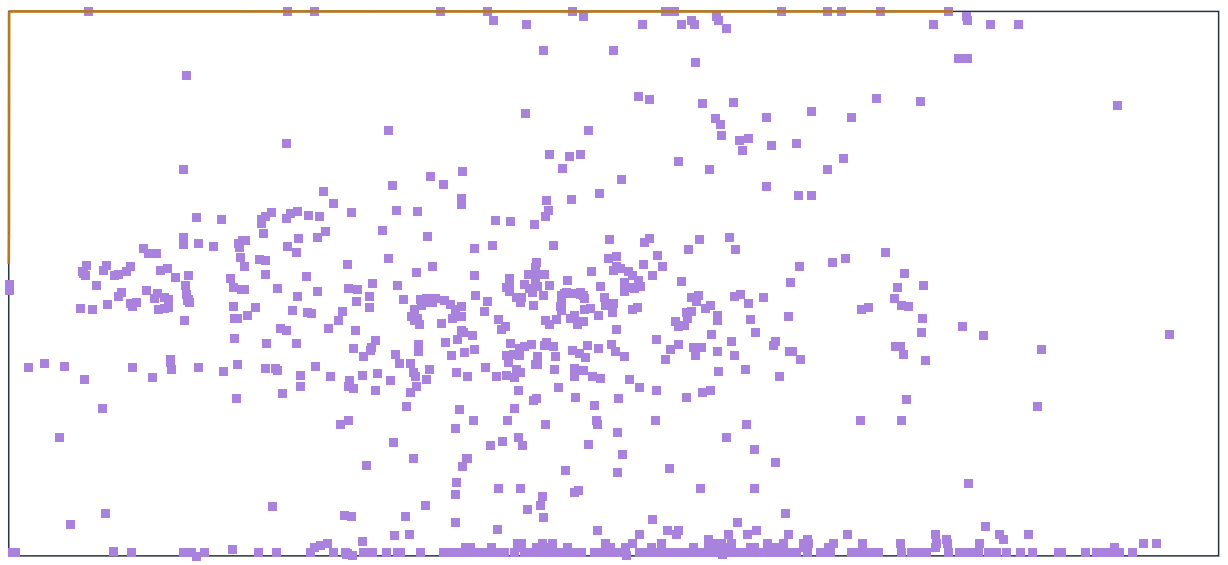
Pillars - Throughput vs hard Acc



Pareto - hard Acc vs Lucy Score

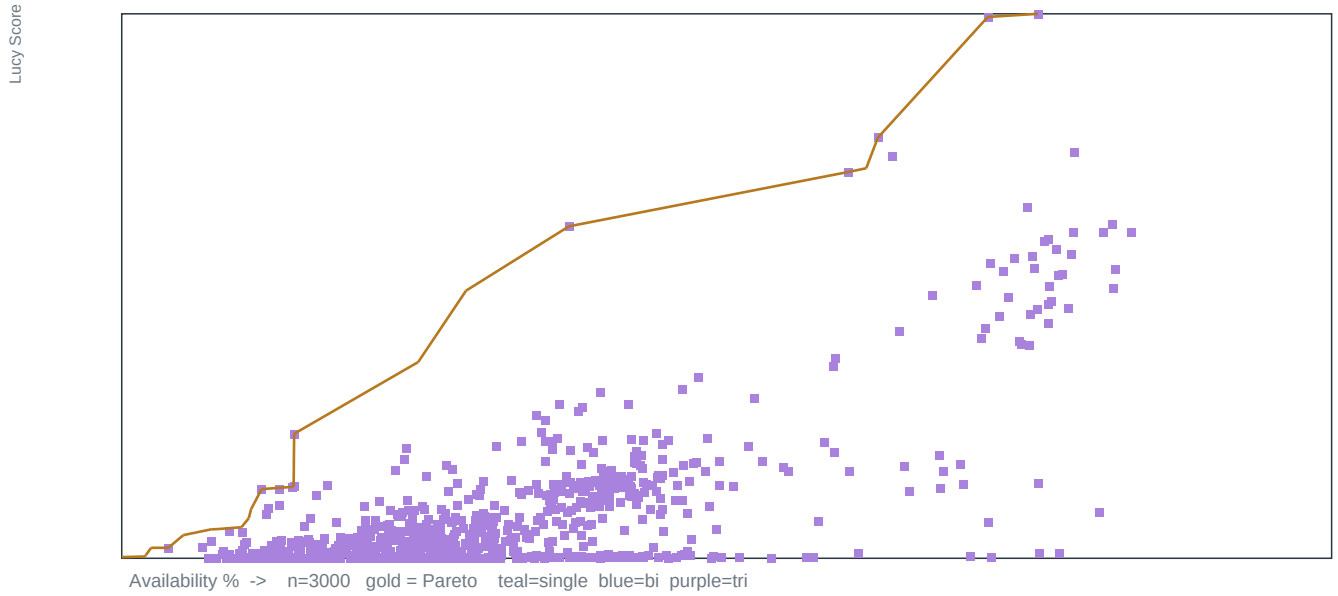


SoftAcc (serve-confidence) vs hard Acc

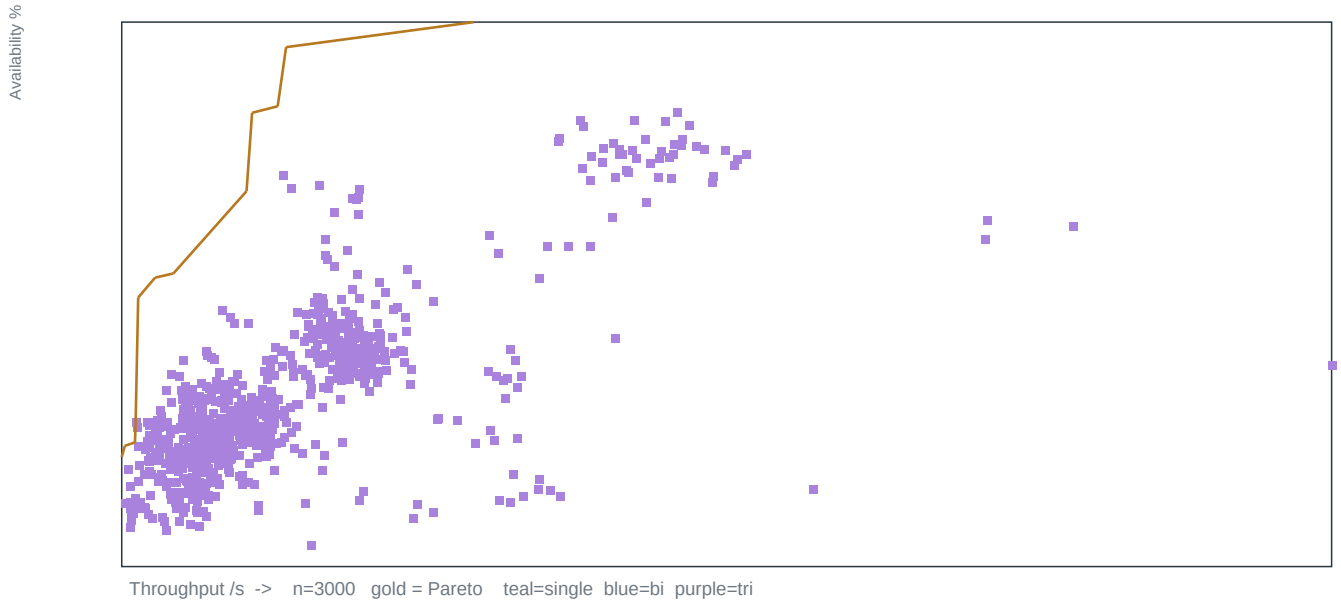



SoftAcc % -> n=3000 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

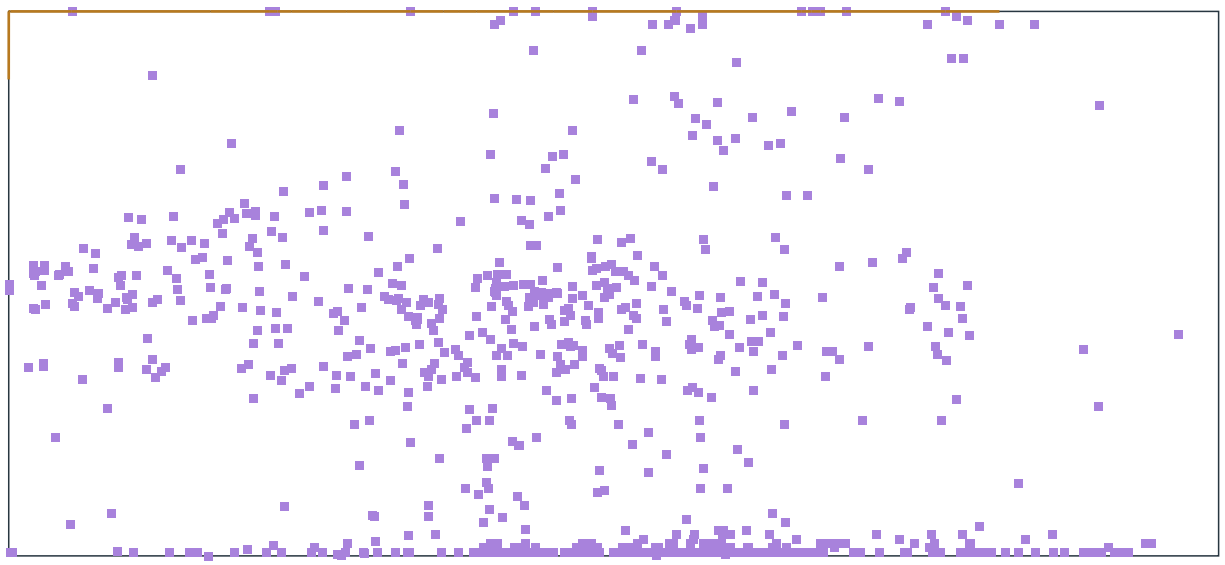
Avail vs Lucy Score (duty clock)



Pillars - Throughput vs Availability



AdaptPct vs hard Acc



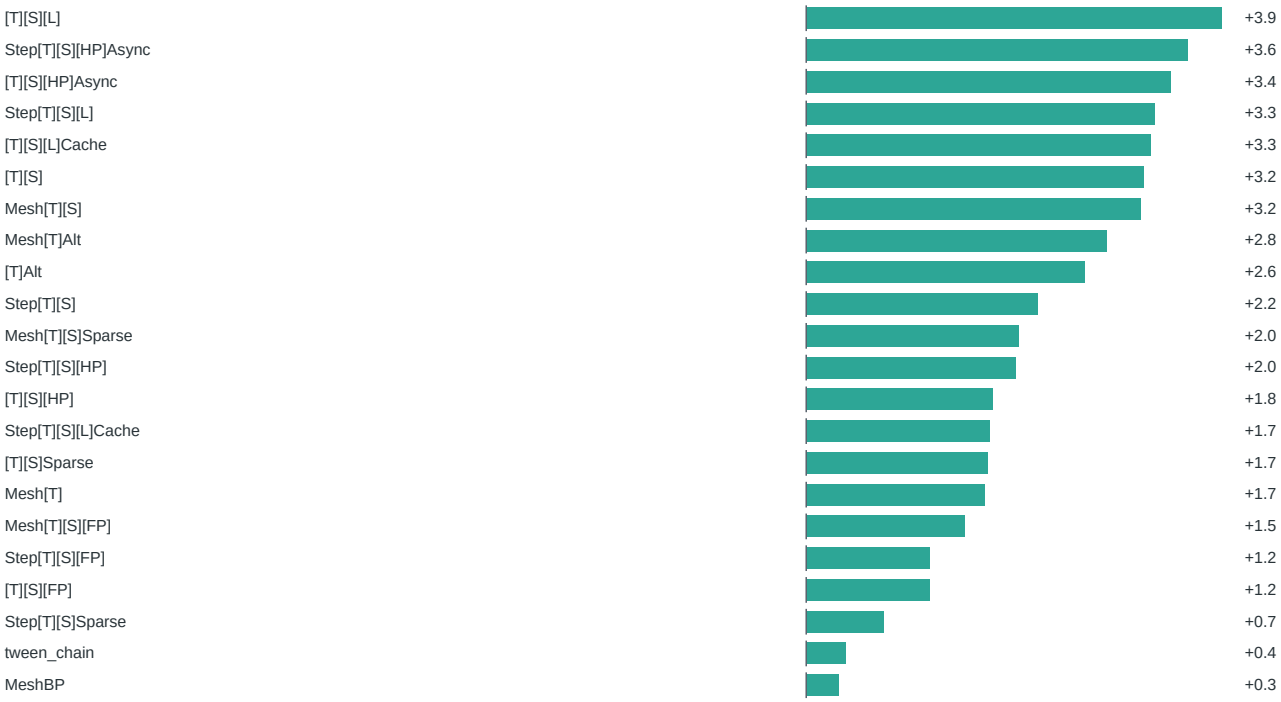

AdaptPct % -> n=3000 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

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%
[T][S][L]	136	+3.9	76	-5.8	+6.8	+2331	+209.3	95
Step[T][S][HP]Async	136	+3.6	76	-6.4	+9.6	+3327	+306.1	96
[T][S][HP]Async	136	+3.4	79	-6.6	+9.5	+3376	+302.7	96
Step[T][S][L]	136	+3.3	74	-5.7	+6.4	+2316	+203.0	95
[T][S][L]Cache	136	+3.3	71	-5.9	+9.4	+3063	+279.9	94
[T][S]	136	+3.2	71	-1.4	+9.9	+3405	+311.8	92
Mesh[T][S]	136	+3.2	69	-2.2	+10.3	+3292	+311.5	90
Mesh[T]Alt	136	+2.8	65	-1.2	-3.5	-233	+23.8	26
[T]Alt	136	+2.6	66	-0.9	-3.4	+206	+41.6	30
Step[T][S]	136	+2.2	64	-2.2	+9.8	+3394	+284.2	88
Mesh[T][S]Sparse	136	+2.0	67	-2.2	+32.9	+11783	+1526.8	97
Step[T][S][HP]	136	+2.0	66	+0.8	+10.0	+3411	+300.5	82
[T][S][HP]	136	+1.8	66	+0.7	+10.3	+3305	+280.4	83
Step[T][S][L]Cache	136	+1.7	68	-6.1	+8.3	+3141	+245.2	90
[T][S]Sparse	136	+1.7	68	-2.4	+31.8	+11997	+1450.6	96
Mesh[T]	135	+1.7	67	-1.2	+21.1	+7100	+803.8	87
Mesh[T][S][FP]	136	+1.5	68	+0.9	+10.3	+3286	+285.7	83
Step[T][S][FP]	136	+1.2	63	+0.7	+9.8	+3300	+266.2	85
[T][S][FP]	136	+1.2	66	+0.8	+9.8	+3237	+255.9	82
Step[T][S]Sparse	136	+0.7	68	-2.0	+31.9	+11634	+1334.9	93
tween_chain	136	+0.4	60	+0.2	+0.2	+10	+0.5	54
MeshBP	136	+0.3	63	+0.1	+1.3	+402	+25.6	63
Mesh[T]Chain	136	-0.0	60	+1.3	-0.3	-176	+7.8	49
step_sgd	136	-0.4	51	-0.6	+1.9	+688	+36.5	68
tween	136	-0.5	57	-0.2	+1.2	+509	+17.7	61
Step[T]Alt	136	-0.5	58	+0.9	-4.1	-873	-51.2	9
step_tween_chain	136	-0.9	48	-1.3	+1.6	+796	+35.7	64
step_tween	136	-0.9	55	-1.3	+2.0	+1057	+45.4	71

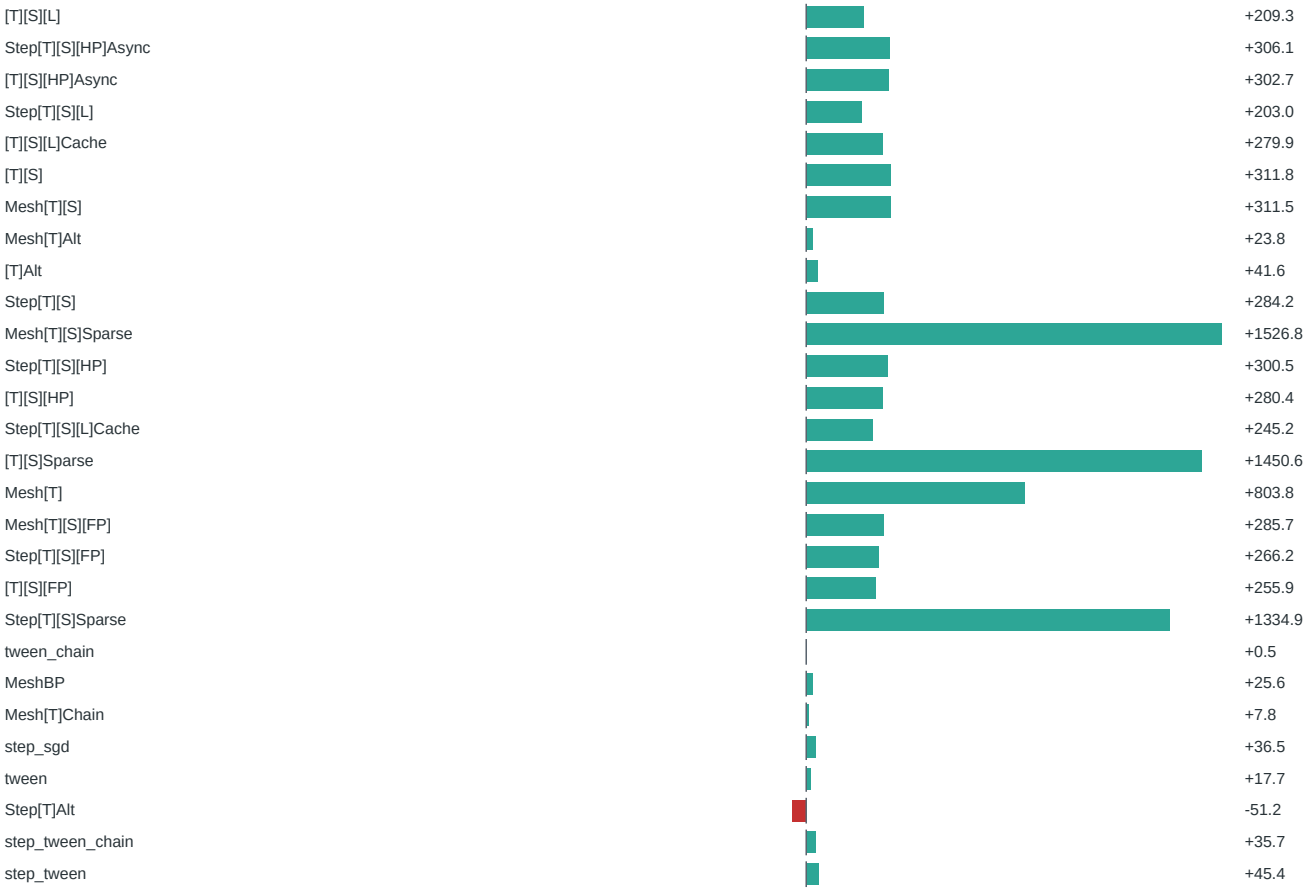
mean AccD vs sgd



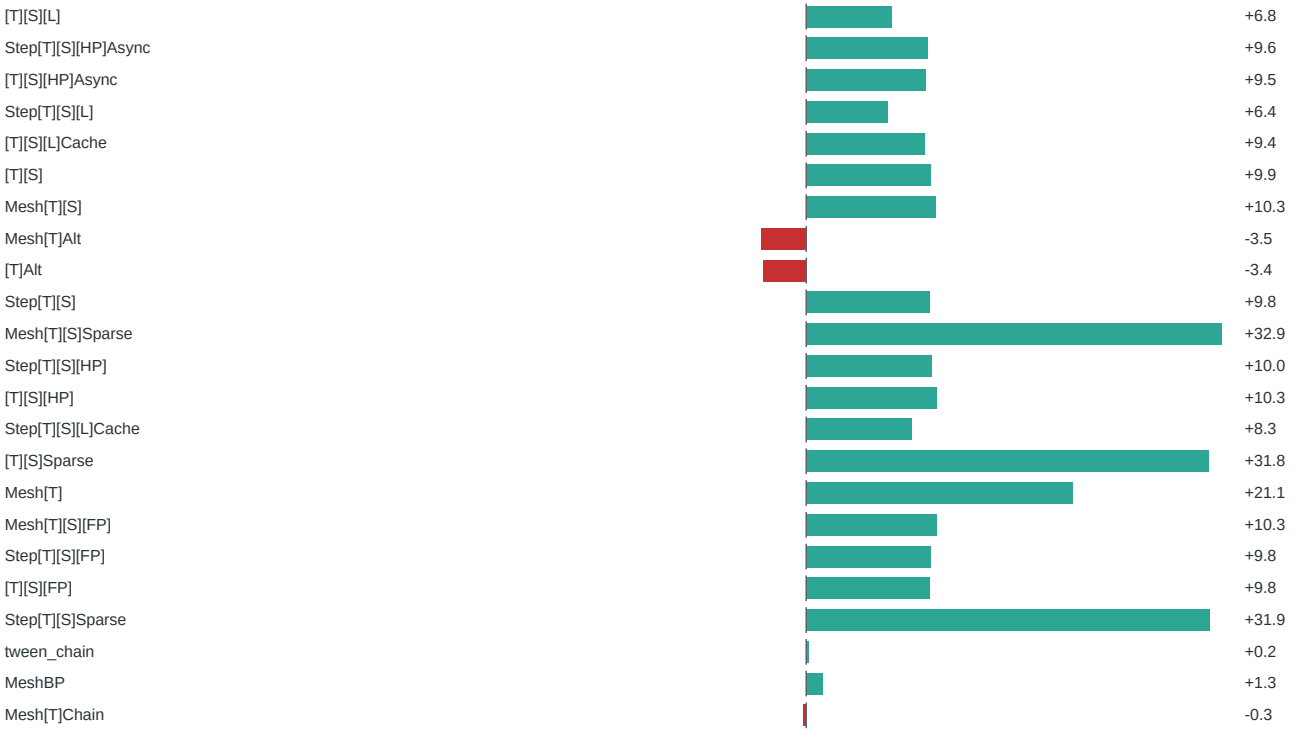
mean AccD vs sgd



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

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	-4	-1	+4	-6	+5	-8	+0	-1	+8	+7	-1	+3
Mesh[T]	-6	+4	+11	-4	+10	-2	-6	+6	+20	+3	+4	-3
Mesh[T]Alt	-4	+1	+6	-0	+18	-3	-5	+5	+8	+11	-2	-6
Mesh[T]Chain	-9	-4	+3	+2	+6	-4	-14	+2	+15	-9	-1	-6
Mesh[T][S]	-5	-1	-2	+13	+7	+9	-2	+5	+9	-4	-4	+9
Mesh[T][S][FP]	-11	+6	-2	+0	+11	+2	+3	-5	+14	-6	+2	+1
Mesh[T][S]Sparse	-7	-7	+5	-2	+6	+1	-1	+2	+10	+2	+2	+4
Step[T]Alt	-12	-5	+9	+2	+3	-1	+1	+5	+10	+2	-2	+6
Step[T][S]	-11	-4	+3	+4	+4	-0	-0	+6	+20	-3	-1	+15
Step[T][S][FP]	-10	-2	+4	+5	+8	+1	+2	-0	+9	-4	-1	-5
Step[T][S][HP]	-0	-4	+3	+19	-0	+2	-2	+8	+9	-8	+5	+8
Step[T][S][HP]Async	-5	-1	+3	+7	+9	+3	-9	-0	+14	+7	+3	+10
Step[T][S][L]	-10	-3	+7	+10	+7	-0	-5	+4	+14	+5	-2	+9
Step[T][S][L]Cache	-3	-5	+6	+7	+7	+2	-0	+6	+14	+2	+3	+1
Step[T][S]Sparse	-14	-11	+6	+3	+7	-5	-5	+6	+9	+1	+1	-1
[T]Alt	-1	-9	+7	+5	+6	-2	+8	-0	+8	+7	+10	+14
[T][S]	-8	+7	+5	+3	+8	+2	-11	+4	+9	+11	+3	+7
[T][S][FP]	-15	-2	+11	+7	+9	-4	-3	+4	+8	-1	-0	+1
[T][S][HP]	-6	+0	+5	+13	+5	-1	-2	-2	+8	-3	-2	+2
[T][S][HP]Async	-3	-2	+9	+8	+11	-2	+2	+5	+11	+6	+3	+8
[T][S][L]	-4	+6	+6	+8	+8	-1	+3	+5	+13	+13	-1	+2
[T][S][L]Cache	-10	-2	+4	-0	+9	+3	-4	+6	+14	+1	+5	+7
[T][S]Sparse	-9	-7	+6	-3	+5	-1	-0	+5	+4	+4	-3	-1
step_sgd	-19	-3	+2	-6	+7	-6	-9	+7	+10	+3	+6	-1
step_tween	-10	-7	+9	+4	+5	-5	-2	+4	+11	-3	+4	-0
step_tween_chain	-14	-4	-3	+7	+4	-7	-3	+1	+7	+0	+3	+5
tween	-9	-2	-1	+1	+2	-6	-4	-3	+14	+7	+3	-5
tween_chain	-6	-1	+5	+8	+4	+0	+3	-0	+6	+1	-1	-4

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	-1	-2	+4	-1	-1	-6	-1	-0	-17
Mesh[T]	-2	+7	+4	-5	+6	+6	+1	+8	+5	-15
Mesh[T]Alt	+1	-1	-7	+4	+4	-0	+7	+13	+3	-12
Mesh[T]Chain	-3	-2	+0	+1	-6	-8	+4	-5	+12	-16
Mesh[T][S]	-5	+1	+9	+3	+4	-1	+4	-5	+7	+3
Mesh[T][S][FP]	-2	+5	+6	+1	-5	-2	+7	+11	+2	-16
Mesh[T][S]Sparse	+2	-2	+2	+6	+13	-4	-1	+7	+4	-8
Step[T]Alt	+0	-2	-2	+3	-2	-5	+2	+9	+6	-12
Step[T][S]	-4	+11	-4	+2	+2	+3	-1	+9	+3	-8
Step[T][S][FP]	+7	-1	+3	-9	+0	+2	-4	+11	+1	-12
Step[T][S][HP]	-6	+5	-10	-0	+4	-7	+2	+2	+14	-22
Step[T][S][HP]Async	+5	-2	+8	+7	+6	+5	+0	+8	+4	-5
Step[T][S][L]	+5	+3	+2	+6	+6	+5	+2	+9	+5	-3
Step[T][S][L]Cache	+1	-2	-8	+0	-3	-8	+5	+2	-1	-6
Step[T][S]Sparse	+3	+1	+11	-2	-1	-4	+6	+1	+7	-13
[T]Alt	+2	+3	-1	-6	+4	+2	+1	-5	+5	-8
[T][S]	+6	+4	+4	+5	+2	+3	+2	+9	+10	-6
[T][S][FP]	-0	+5	-4	-1	+5	-5	+11	+2	+3	-11
[T][S][HP]	+7	+7	-2	-0	-4	-6	+7	+2	+8	-11
[T][S][HP]Async	+3	+5	+3	+7	+1	+4	+1	+8	+9	-10
[T][S][L]	+7	-1	+3	+5	+5	+4	+3	+8	+6	-4
[T][S][L]Cache	+5	+7	+2	+4	+4	+3	+1	+5	+15	-5
[T][S]Sparse	+1	-0	+4	+6	+2	-6	-1	+14	+7	-2
step_sgd	+5	-7	+5	-6	+3	-7	-1	+5	-2	-10
step_tween	+1	-2	+3	+1	-6	-3	+3	-4	+5	-14
step_tween_chain	-8	+0	-8	-6	+2	-9	-6	+5	+2	-20
tween	+3	-5	-1	+13	-0	+7	+5	+3	+3	-12
tween_chain	-0	+3	+9	-0	+1	-5	-0	-4	+7	-16

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	+43	+20	-14	+162	+124	+85	+105	+7	+11	+26	-7	+77
Mesh[T]	+681	+796	+966	+883	+750	+1829	+1206	+1485	+597	+390	+760	+651
Mesh[T]Alt	+262	-123	+245	+191	+230	+738	+617	-97	-40	-41	+174	-61
Mesh[T]Chain	+51	-40	+67	+76	+120	+140	+138	+213	-17	-12	+49	+84
Mesh[T][S]	+488	+348	+474	+413	+579	+665	+669	+133	+150	+243	+308	+473
Mesh[T][S][FP]	+444	+416	+292	+601	+519	+711	+679	+127	+82	+96	+377	+309
Mesh[T][S]Sparse	+2146	+2224	+1969	+2069	+1964	+2803	+2966	+1314	+444	+1368	+1930	+1638
Step[T]Alt	-89	-75	-46	-45	-50	-41	-76	-92	-44	-38	-133	-6
Step[T][S]	+419	+195	+540	+534	+537	+315	+528	+71	+211	+218	+389	+314
Step[T][S][FP]	+494	+277	+316	+513	+568	+319	+602	+172	+78	+285	+297	+406
Step[T][S][HP]	+440	+379	+592	+605	+597	+281	+594	+185	+110	+306	+328	+336
Step[T][S][HP]Async	+445	+339	+422	+487	+482	+371	+527	+128	+132	+332	+399	+417
Step[T][S][L]	+309	+74	+281	+321	+378	+276	+443	+101	+44	+109	+263	+216
Step[T][S][L]Cache	+273	+241	+341	+365	+364	+222	+368	+141	+130	+363	+237	+447
Step[T][S]Sparse	+2008	+1225	+1873	+2037	+1894	+2002	+3020	+1270	+234	+1592	+1900	+1416
[T]Alt	+252	-124	+255	+249	+142	+1357	+624	-79	-48	-42	+153	-38
[T][S]	+508	+369	+485	+536	+512	+427	+582	+76	+60	+482	+365	+102
[T][S][FP]	+543	+199	+325	+279	+520	+388	+648	+115	+97	+177	+372	+425
[T][S][HP]	+465	+371	+337	+342	+610	+383	+645	+120	+109	+343	+399	+338
[T][S][HP]Async	+460	+296	+433	+430	+516	+350	+456	+127	+47	+318	+304	+358
[T][S][L]	+255	+56	+311	+336	+200	+282	+374	+136	+67	+209	+363	+229
[T][S][L]Cache	+283	+225	+349	+264	+349	+255	+367	+132	+144	+216	+256	+442
[T][S]Sparse	+2056	+1920	+1833	+2064	+2115	+2238	+2911	+1250	+452	+1442	+1829	+1863
step_sgd	+68	+135	+179	+38	+29	+51	+35	+47	-42	+74	+83	+82
step_tween	+93	+86	+14	+107	-23	+203	+167	+2	-1	+3	-17	+73
step_tween_chain	+78	-16	+151	+54	+129	+208	+36	+28	-20	+78	+48	+40
tween	+24	+9	+29	+23	-4	+93	+16	-16	-16	+18	-95	+130
tween_chain	+42	-63	-11	-0	+104	+26	-13	-7	-10	+37	-30	+4

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	-52	+39	+1	-47	+82	-5	-6	+57	+88	+15	+12	-2
Mesh[T]	+647	+1453	+811	+580	+1178	+581	+374	+845	+1251	+551	+1125	+495
Mesh[T]Alt	-152	-85	-28	-95	+2	-30	-51	-76	+3	-25	-80	-76
Mesh[T]Chain	-121	-73	-13	-36	+41	-9	-48	+63	+88	-32	-16	-59
Mesh[T][S]	+248	+142	+65	+460	+367	+271	+106	+435	+302	+22	+181	+389
Mesh[T][S][FP]	+183	+292	+81	+268	+458	+135	+122	+168	+503	+30	+400	+262
Mesh[T][S]Sparse	+1709	+799	+819	+1176	+1675	+744	+663	+1945	+1780	+685	+1590	+1381
Step[T]Alt	-172	-96	-20	-48	-30	-15	-27	-46	+36	-34	-72	-24
Step[T][S]	+123	+199	+142	+317	+264	+161	+95	+500	+615	+47	+259	+483
Step[T][S][FP]	+172	+140	+140	+360	+413	+130	+94	+338	+287	+34	+244	+57
Step[T][S][HP]	+409	+133	+178	+782	+99	+186	+118	+442	+410	+3	+371	+408
Step[T][S][HP]Async	+231	+221	+153	+417	+391	+193	+61	+316	+435	+141	+356	+353
Step[T][S][L]	+107	+116	+99	+386	+236	+93	+37	+278	+385	+70	+212	+235
Step[T][S][L]Cache	+307	+180	+179	+439	+344	+149	+115	+425	+445	+74	+294	+193
Step[T][S]Sparse	+895	+577	+837	+1597	+1654	+578	+490	+2108	+1534	+536	+1477	+874
[T]Alt	-147	-114	-23	-62	-33	-30	-40	-78	+8	-20	-39	-17
[T][S]	+209	+282	+137	+358	+361	+174	+14	+420	+398	+190	+335	+338
[T][S][FP]	+69	+111	+215	+363	+397	+128	+63	+434	+330	+63	+269	+260
[T][S][HP]	+226	+173	+173	+603	+284	+130	+71	+288	+339	+43	+248	+247
[T][S][HP]Async	+292	+198	+254	+457	+479	+117	+178	+379	+356	+116	+353	+333
[T][S][L]	+183	+230	+62	+255	+259	+88	+105	+282	+315	+125	+185	+177
[T][S][L]Cache	+115	+156	+102	+254	+404	+169	+107	+512	+458	+75	+428	+327
[T][S]Sparse	+1534	+927	+833	+985	+1541	+802	+608	+2119	+1101	+738	+1197	+953
step_sgd	-154	+13	+34	-34	+82	+24	-23	+102	+77	+28	+71	+26
step_tween	-25	-47	+54	+86	+126	+6	-5	+123	+131	-10	+118	+41
step_tween_chain	-100	-16	-14	+116	+82	-4	+16	+67	+91	+30	+82	+117
tween	-55	-14	-17	+43	+54	-8	-14	+8	+149	+31	+36	-32
tween_chain	-53	-25	+3	+51	+28	+27	+4	-33	+70	-3	-13	-41

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	+73	+8	-8	+62	+15	+13	-15	-2	+18	-113
Mesh[T]	+703	+843	+612	+522	+834	+570	+435	+835	+677	+289
Mesh[T]Alt	-77	-75	-48	-43	-49	-38	-27	-12	-72	-153
Mesh[T]Chain	-65	-35	-7	-20	-68	-29	+14	-51	+7	-135
Mesh[T][S]	+177	+181	+311	+337	+351	+125	+177	+129	+441	+432
Mesh[T][S][FP]	+232	+167	+191	+299	+114	+84	+152	+562	+273	+86
Mesh[T][S]Sparse	+1945	+747	+867	+2085	+2618	+566	+538	+1881	+1589	+1275
Step[T]Alt	-33	-64	-36	-51	-64	-41	-25	+17	-28	-136
Step[T][S]	+188	+275	+71	+315	+287	+111	+96	+351	+277	+215
Step[T][S][FP]	+550	+145	+211	+60	+278	+103	+71	+469	+285	+142
Step[T][S][HP]	+113	+200	+13	+240	+379	+72	+105	+273	+587	-56
Step[T][S][HP]Async	+342	+160	+194	+375	+404	+183	+150	+362	+263	+230
Step[T][S][L]	+299	+112	+101	+228	+208	+100	+71	+327	+256	+126
Step[T][S][L]Cache	+260	+156	+17	+232	+199	+11	+106	+246	+200	+270
Step[T][S]Sparse	+1944	+1082	+1178	+1214	+1246	+496	+676	+1192	+1800	+930
[T]Alt	-86	-57	-43	-92	-66	-32	-23	-81	-72	-140
[T][S]	+433	+184	+175	+327	+316	+159	+119	+463	+454	+252
[T][S][FP]	+257	+182	+60	+200	+320	+85	+151	+245	+287	+122
[T][S][HP]	+480	+190	+119	+245	+91	+81	+127	+322	+417	+172
[T][S][HP]Async	+320	+265	+170	+360	+281	+176	+138	+375	+396	+205
[T][S][L]	+374	+110	+90	+232	+250	+124	+71	+336	+277	+171
[T][S][L]Cache	+414	+283	+152	+393	+370	+158	+126	+270	+682	+282
[T][S]Sparse	+1871	+914	+856	+1791	+1382	+477	+475	+2429	+1966	+1851
step_sgd	+112	-41	+40	-17	+48	-19	+17	+90	+0	-14
step_tween	+81	-29	+28	+89	-31	-2	+32	+12	+106	-51
step_tween_chain	-39	+21	-21	-16	+52	-26	-7	+58	+46	-133
tween	+78	-35	-2	+99	+31	+15	+26	+35	+37	-73
tween_chain	+3	+7	+49	-24	+3	-17	+11	-52	+52	-109

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	+0	-1	-2	+3	+1	+7	+1	-1	+5	-0	-1	+6
Mesh[T]	+22	+18	+18	+21	+26	+26	+15	+28	+24	+14	+21	+20
Mesh[T]Alt	+8	-8	+4	+1	+5	+13	+7	-7	-3	-5	+3	-2
Mesh[T]Chain	+2	-2	+1	+3	+2	+7	+0	+6	+3	-0	+1	+5
Mesh[T][S]	+15	+10	+11	+7	+15	+16	+11	+2	+13	+9	+9	+16
Mesh[T][S][FP]	+12	+11	+10	+15	+12	+15	+9	+5	+12	+10	+11	+16
Mesh[T][S]Sparse	+40	+31	+32	+37	+33	+33	+28	+26	+35	+33	+34	+37
Step[T]Alt	-0	-4	-6	-4	-2	-1	-3	-7	+1	-4	-6	-2
Step[T][S]	+12	+10	+12	+15	+14	+4	+6	+5	+17	+10	+10	+14
Step[T][S][FP]	+16	+8	+12	+12	+13	+4	+7	+7	+11	+11	+12	+19
Step[T][S][HP]	+12	+11	+9	+14	+14	+2	+8	+8	+13	+9	+13	+18
Step[T][S][HP]Async	+14	+11	+11	+12	+11	+6	+6	+5	+11	+11	+14	+17
Step[T][S][L]	+11	+6	+4	+8	+11	+5	+6	+2	+6	+5	+6	+6
Step[T][S][L]Cache	+8	+6	+9	+12	+12	+3	+5	+4	+12	+12	+7	+14
Step[T][S]Sparse	+34	+30	+32	+36	+33	+17	+29	+25	+34	+34	+36	+39
[T]Alt	+7	-7	+4	+6	+4	+11	+8	-4	-4	-5	+3	-2
[T][S]	+14	+12	+10	+12	+12	+7	+8	+3	+8	+14	+13	+18
[T][S][FP]	+17	+15	+12	+13	+12	+6	+8	+3	+9	+9	+11	+16
[T][S][HP]	+12	+12	+13	+16	+15	+4	+8	+3	+11	+12	+14	+19
[T][S][HP]Async	+14	+8	+8	+12	+13	+5	+5	+4	+16	+12	+11	+13
[T][S][L]	+8	+5	+7	+8	+11	+4	+4	+4	+6	+5	+10	+11
[T][S][L]Cache	+9	+11	+9	+7	+12	+5	+6	+4	+11	+12	+10	+14
[T][S]Sparse	+36	+35	+31	+38	+35	+18	+27	+24	+31	+35	+34	+38
step_sgd	+4	+3	+1	+2	+2	+1	+0	+3	+0	+2	+3	+9
step_tween	+5	+2	+1	+7	+6	+5	+1	-2	+3	-0	+2	+7
step_tween_chain	+4	-0	+1	+3	+1	+1	-0	+1	+3	+1	+1	+5
tween	+5	-1	+1	+3	+5	+4	+1	-3	+1	+3	+2	+6
tween_chain	+3	-1	-0	+0	+1	+2	-1	-0	+3	+1	-1	+3

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	+3	-2	-1	+5	+5	-3	+5	+0	-3	+1	+1
Mesh[T]	+17	+27	+25	+18	+28	+28	+21	+18	+18	+13	+22	+17
Mesh[T]Alt	-9	-6	-6	-10	-5	-1	-7	-8	-5	-5	-7	-6
Mesh[T]Chain	-4	-5	-3	-4	+2	+1	-2	+1	-1	-1	-1	-2
Mesh[T][S]	+6	+5	+8	+8	+12	+13	+9	+12	+5	+6	+9	+11
Mesh[T][S][FP]	+9	+8	+8	+12	+12	+10	+7	+10	+10	+6	+12	+10
Mesh[T][S]Sparse	+33	+24	+32	+32	+37	+33	+33	+35	+31	+26	+33	+34
Step[T]Alt	-9	-6	-6	-7	-4	-0	-3	-5	-4	-5	-6	-5
Step[T][S]	+9	+7	+10	+10	+11	+14	+7	+11	+8	+8	+9	+8
Step[T][S][FP]	+8	+5	+7	+8	+13	+9	+4	+11	+6	+6	+10	+11
Step[T][S][HP]	+8	+7	+10	+11	+8	+13	+14	+8	+10	+4	+8	+10
Step[T][S][HP]Async	+6	+6	+10	+10	+11	+13	+7	+10	+8	+5	+10	+9
Step[T][S][L]	+7	+6	+4	+8	+8	+9	+6	+6	+8	+3	+10	+6
Step[T][S][L]Cache	+6	+6	+11	+11	+10	+11	+9	+9	+7	+5	+7	+8
Step[T][S]Sparse	+29	+26	+33	+35	+37	+36	+35	+33	+27	+23	+31	+34
[T]Alt	-9	-7	-6	-7	-7	-3	-8	-6	-5	-3	-7	-6
[T][S]	+7	+6	+7	+12	+12	+12	+10	+12	+12	+6	+10	+9
[T][S][FP]	+10	+5	+8	+9	+12	+15	+5	+12	+9	+8	+9	+13
[T][S][HP]	+6	+6	+11	+11	+11	+13	+7	+12	+9	+5	+10	+14
[T][S][HP]Async	+8	+7	+12	+13	+13	+8	+11	+8	+5	+5	+9	+9
[T][S][L]	+5	+7	+1	+4	+10	+9	+7	+6	+5	+3	+8	+10
[T][S][L]Cache	+6	+5	+5	+10	+11	+10	+11	+10	+8	+5	+10	+12
[T][S]Sparse	+30	+27	+32	+32	+36	+37	+27	+33	+32	+25	+33	+33
step_sgd	-1	+3	+3	+1	+2	+7	+1	+0	-0	+1	-1	+3
step_tween	+1	-2	+1	+1	+6	+3	-1	+1	-1	-1	+1	+3
step_tween_chain	-2	-0	-0	+1	+3	+2	+4	+3	-1	+4	+2	+5
tween	-1	-0	-0	+3	+4	+1	+1	+2	+0	-0	-2	+2
tween_chain	-2	-3	-3	-2	+1	+5	-1	-2	+1	-1	-0	-0

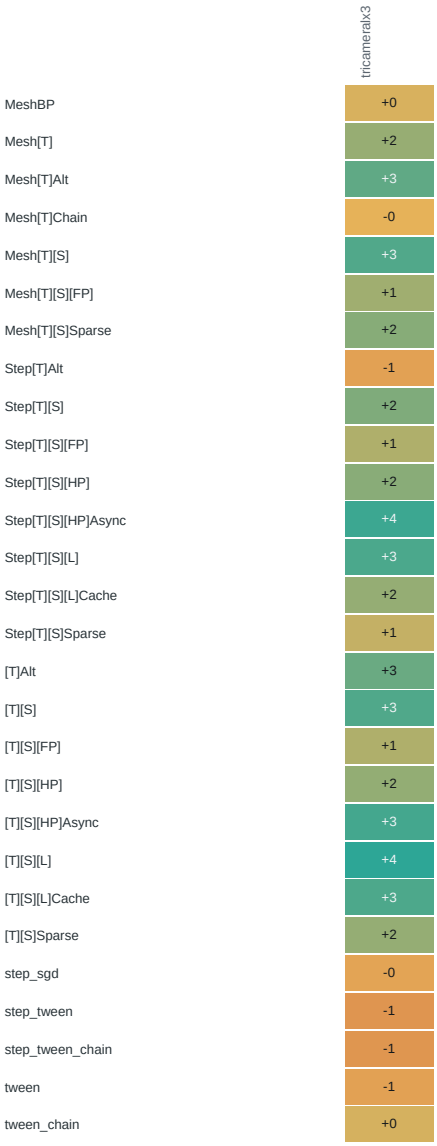
AvailD vs sgd, every mode x dtype (cols 25-34)

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

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	+3	-1	+1	+2	+2	+3	+4	+1	+1	+2
Mesh[T]	+24	+25	+22	+19	+21	+23	+24	+20	+16	+16
Mesh[T]Alt	-4	-8	-6	-5	-4	-7	-7	-5	-8	-7
Mesh[T]Chain	-3	-3	-1	-1	-3	-1	+2	-1	-6	-0
Mesh[T][S]	+10	+8	+13	+12	+11	+9	+16	+12	+12	+11
Mesh[T][S][FP]	+11	+7	+9	+12	+9	+7	+8	+14	+10	+12
Mesh[T][S]Sparse	+37	+28	+36	+37	+32	+37	+37	+32	+28	+32
Step[T]Alt	-1	-4	-4	-6	-5	-6	-5	-2	-5	-5
Step[T][S]	+12	+6	+10	+10	+10	+5	+10	+12	+8	+9
Step[T][S][FP]	+14	+7	+14	+12	+12	+6	+10	+8	+12	+13
Step[T][S][HP]	+9	+6	+6	+11	+11	+13	+10	+10	+11	+11
Step[T][S][HP]Async	+8	+6	+9	+10	+11	+10	+15	+9	+8	+8
Step[T][S][L]	+8	+4	+8	+6	+3	+6	+5	+8	+8	+5
Step[T][S][L]Cache	+8	+8	+8	+9	+8	+5	+7	+9	+8	+12
Step[T][S]Sparse	+34	+29	+30	+36	+32	+34	+32	+35	+32	+36
[T]Alt	-5	-6	-8	-6	-7	-6	-4	-5	-9	-7
[T][S]	+8	+7	+10	+7	+9	+9	+10	+12	+8	+9
[T][S][FP]	+9	+5	+6	+11	+8	+11	+8	+10	+7	+10
[T][S][HP]	+12	+6	+10	+11	+7	+10	+9	+11	+9	+12
[T][S][HP]Async	+9	+8	+9	+9	+10	+11	+10	+9	+6	+11
[T][S][L]	+10	+5	+6	+6	+6	+9	+5	+10	+8	+7
[T][S][L]Cache	+11	+10	+11	+13	+11	+10	+11	+7	+12	+11
[T][S]Sparse	+37	+29	+33	+33	+30	+33	+34	+29	+33	+33
step_sgd	+2	-0	+1	+3	-0	-1	+4	+2	-1	+3
step_tween	+2	-3	+1	+4	+2	-1	+4	+3	+3	+3
step_tween_chain	+2	+1	+2	+3	+2	+0	+4	-1	+0	-0
tween	+3	-0	+1	-3	+3	-3	+2	+1	-0	+1
tween_chain	-0	-1	+2	-1	-0	-0	+5	+0	-1	+1

AccD vs sgd, every mode x arch

AccD vs sgd, every mode x arch



Family collapse - Step* vs non-Step

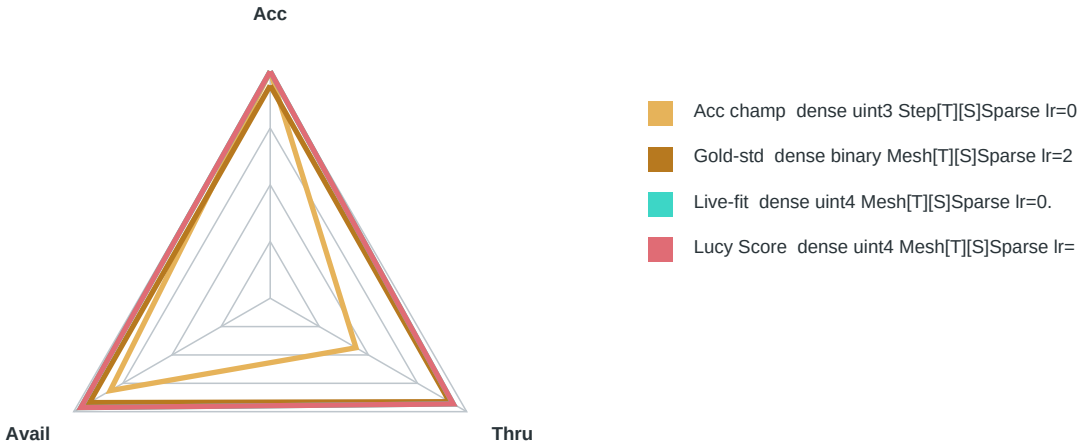
Step* is a 1D pipe (one sample enters layer 0 per tick; output is the sample that entered depth ticks ago). Non-Step of the same family is a full-chain update. AccD is a real scheduler split, not leftover warm-up forwards.

step	plain	n	mean |AccD|
Step[T]Alt	[T]Alt	34	8.59
Step[T][S]	[T][S]	34	8.97
Step[T][S][FP]	[T][S][FP]	34	3.37
Step[T][S][HP]	[T][S][HP]	34	2.61
Step[T][S][HP]Async	[T][S][HP]Async	34	3.87
Step[T][S][L]	[T][S][L]	34	3.17
Step[T][S][L]Cache	[T][S][L]Cache	34	3.37
Step[T][S]Sparse	[T][S]Sparse	34	2.08
step_sgd	sgd	34	6.76
step_tween	tween	34	4.99
step_tween_chain	tween_chain	34	5.29

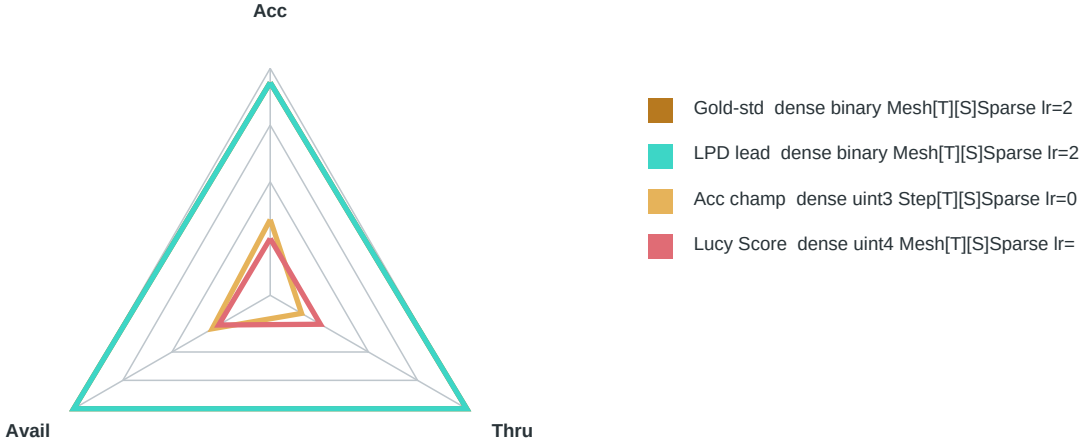
Consciousness - Acc, Throughput, Availability

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|uint3|Step[T][S]Sparse|lr=0.02 Acc 50.0 Thru 8898 Avail 43.5% 1.5 KiB (RAM reference)
Lucy Score champ (T x Avail x Acc) dense|uint4|Mesh[T][S]Sparse|lr=0.02 Score 4887.9 Acc 50.0 Soft 17 2.0 KiB
Live-fit champ (best Q) dense|uint4|Mesh[T][S]Sparse|lr=0.02 Acc 50.0 Thru 18994 Avail 51.5% 2.0 KiB
Gold-std (2+ pillars, Acc keep >= 80%, then smallest then fastest): dense|binary|Mesh[T][S]Sparse|lr=2 mode Mesh[T][S]Sparse Acc 46.9 Thru 18590 0.5 KiB
Board fastest dense|float32|[T][S]Sparse|lr=0.02 Thru 44674 (traps may own this) Best availability dense|fp8e5m2|Step[T][S]Sparse|lr=200 66.9%
Learner Thru peak 20384 learner Avail peak 53.4%

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
Mesh[T][S]Sparse	2	50.0	0.5	18994	dense binary Mesh[T][S]Sparse lr=2 / dense uint4 Mesh[T][S]Sparse~
Step[T][S]Sparse	1	50.0	1.5	8898	dense uint3 Step[T][S]Sparse lr=0.02

Mode	n	Acc	KiB	Thru	Cell
[T][S]Sparse	2	48.8	31.5	20384	dense uint64 [T][S]Sparse lr=0.02

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

Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
near	dense binary Mesh[T][S]Sparse lr=2	94	91	92	92	33	3.0	2.77	46.9	18590	0.5

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

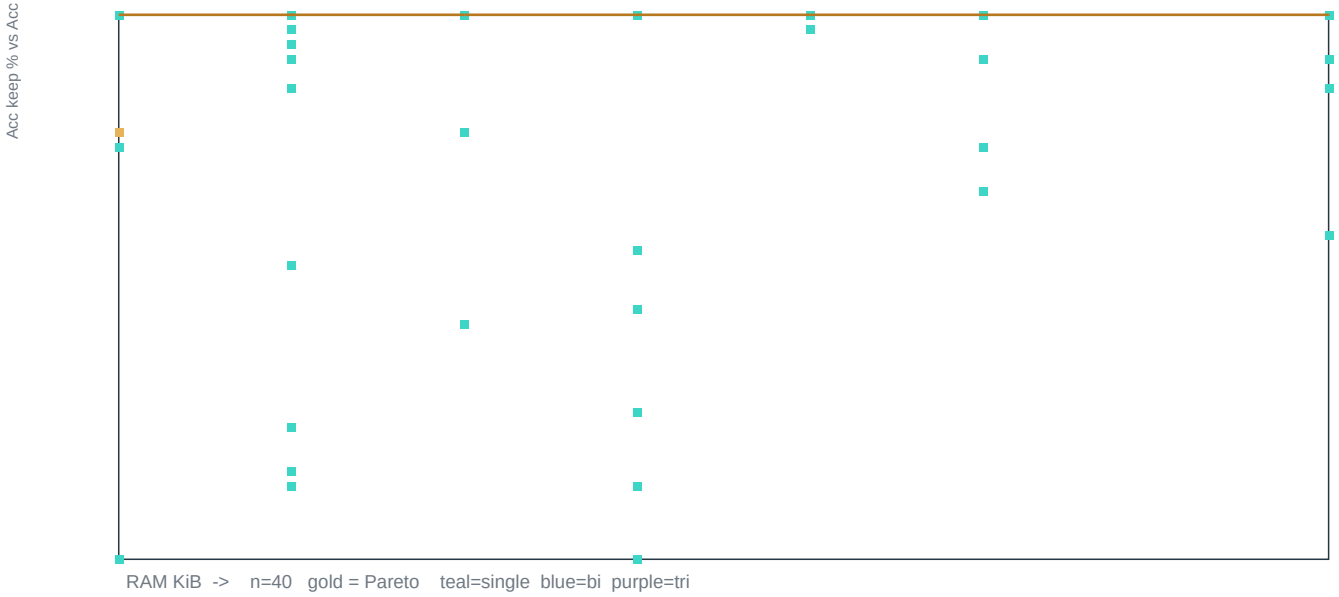
Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
near	dense binary Mesh[T][S]Sparse lr=2	94	91	92	92	33	3.0	2.77	46.9	18590	0.5
acc	dense binary Mesh[T][S][FP] lr=2	93	42	50	58	33	3.0	1.73	46.5	8522	0.5
acc	dense binary StepBP lr=2k	100	20	48	46	33	3.0	1.38	50.0	4081	0.5
-	dense binary NormalBP lr=2	71	24	32	38	33	3.0	1.13	35.5	4889	0.5
acc	dense uint2 Mesh[T] lr=0.02	100	45	61	65	67	1.5	0.98	50.0	9261	1.0
-	dense int2 Mesh[T] lr=0.02	76	51	68	64	67	1.5	0.96	37.9	10350	1.0
-	dense ternary Mesh[T][S][FP] lr=2	75	40	65	58	67	1.5	0.87	37.5	8089	1.0
acc	dense int2 Step[T][S] lr=2k	87	33	60	55	67	1.5	0.83	43.4	6649	1.0
acc	dense int2 Mesh[T][S][FP] lr=2k	100	33	49	55	67	1.5	0.82	50.0	6786	1.0
acc	dense uint2 [T][S][FP] lr=2k	99	32	44	52	67	1.5	0.77	49.6	6441	1.0
acc	dense int2 [T][S] lr=200	98	29	47	51	67	1.5	0.77	49.2	5946	1.0
acc	dense uint2 [T][S][HP] lr=0.02	100	28	41	49	67	1.5	0.73	50.0	5644	1.0
keep	dense uint4 Mesh[T][S]Sparse lr=0.02	100	93	96	96	133	0.8	0.72	50.0	18994	2.0
keep	dense uint3 Step[T][S]Sparse lr=0.02	100	44	81	71	100	1.0	0.71	50.0	8898	1.5
acc	dense uint2 [T][S][L]Cache lr=2	99	26	37	46	67	1.5	0.69	49.6	5387	1.0
acc	dense int2 [T][S][L] lr=0.02	100	28	34	46	67	1.5	0.69	50.0	5674	1.0
-	dense uint2 Step[T][S] lr=0.02	78	29	36	43	67	1.5	0.65	39.1	5904	1.0
acc	dense ternary StepBP lr=2	96	25	33	43	67	1.5	0.65	48.0	5189	1.0
acc	dense ternary [T]Alt lr=2	100	14	32	35	67	1.5	0.53	50.0	2776	1.0
acc	dense uint3 Mesh[T][S] lr=2k	94	26	58	52	100	1.0	0.52	46.9	5272	1.5

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

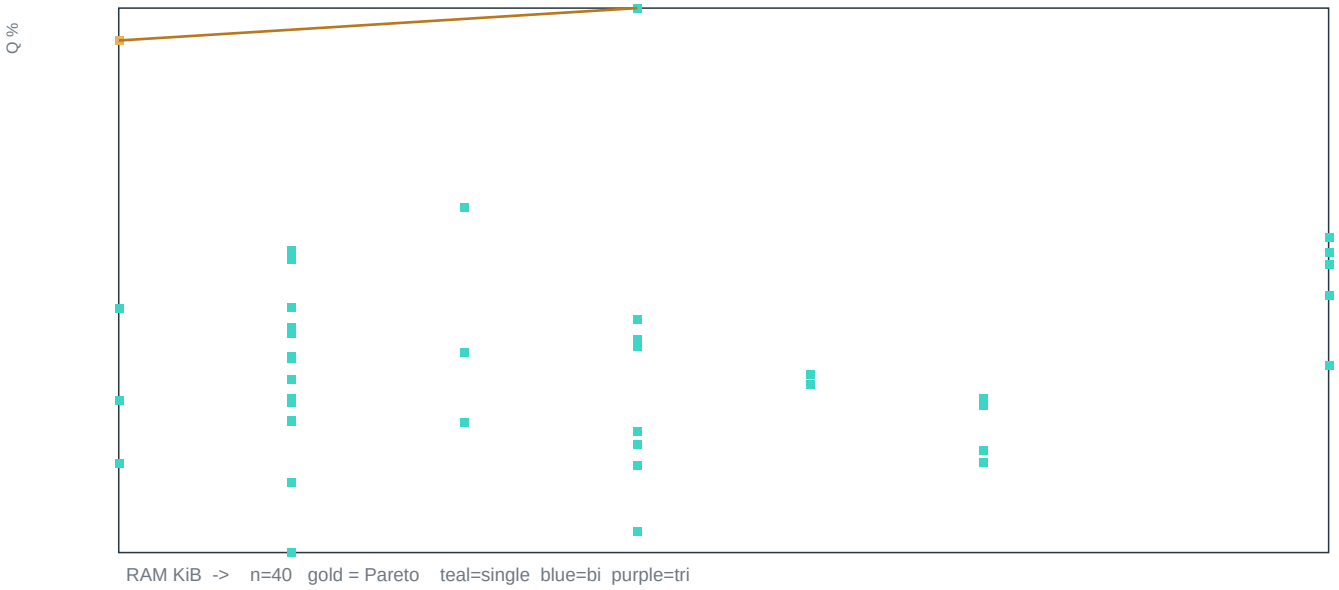
Band	Cell	Acc%	Thru%	Avail%	Q%	LPD	Thru	Avail
keep	dense uint4 Mesh[T][S]Sparse lr=0.02	100	93	96	96	0.72	18994	51.5
keep	dense uint64 [T][S]Sparse lr=0.02	98	100	91	96	0.05	20384	48.8
near	dense binary Mesh[T][S]Sparse lr=2	94	91	92	92	2.77	18590	49.1
keep	dense uintptr [T][S]Sparse lr=0.02	81	83	100	88	0.04	16826	53.4
keep	dense uint3 Step[T][S]Sparse lr=0.02	100	44	81	71	0.71	8898	43.5
acc	dense int8 Mesh[T] lr=0.02	88	54	63	67	0.25	10999	33.6
acc	dense uint2 Mesh[T] lr=0.02	100	45	61	65	0.98	9261	32.7
acc	dense uint8 [T][S][L]Cache lr=0.02	100	52	53	65	0.24	10513	28.4
acc	dense int32 Step[T][S][HP] lr=2k	98	39	69	64	0.06	7968	36.8
-	dense int2 Mesh[T] lr=0.02	76	51	68	64	0.96	10350	36.6

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

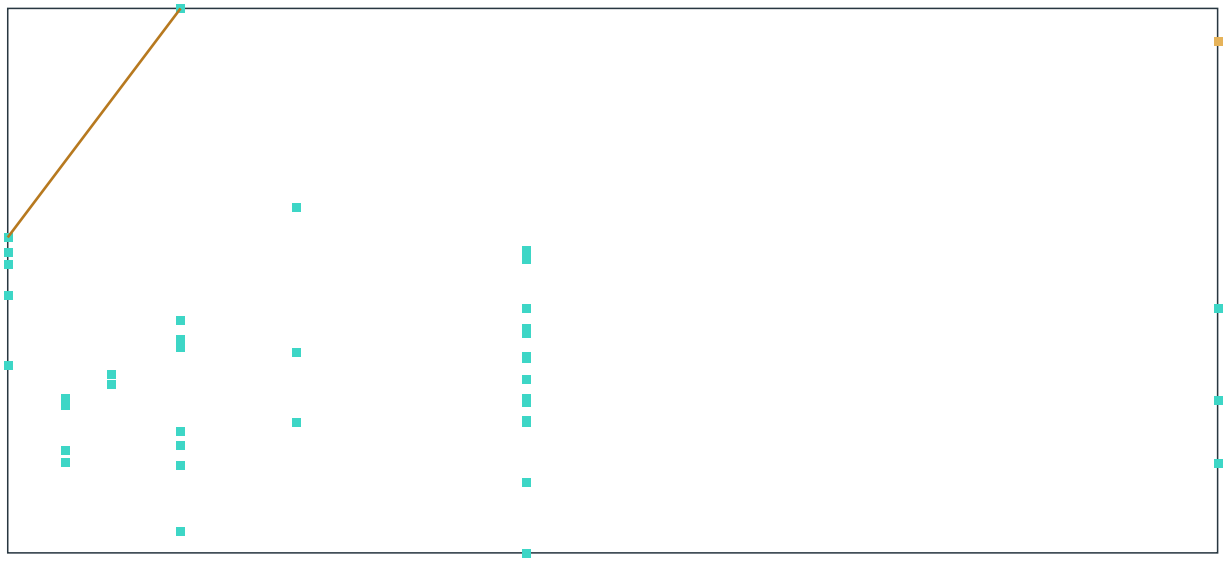
Acc keep % vs RAM KiB (gold = high Acc, low RAM vs Acc champ)



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



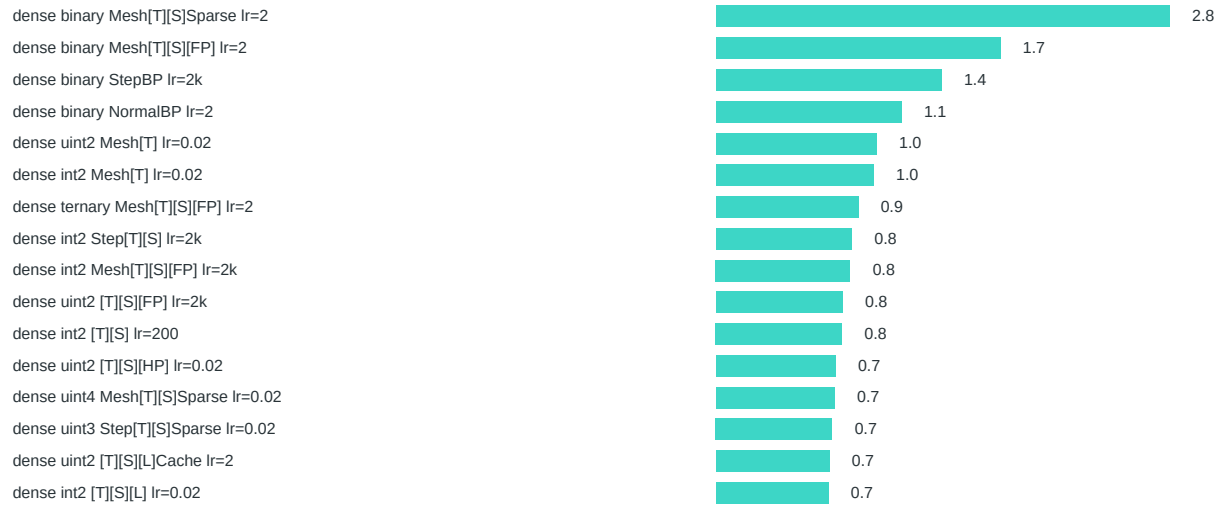
Q% vs shrink vs Acc champ (gold = upper right)



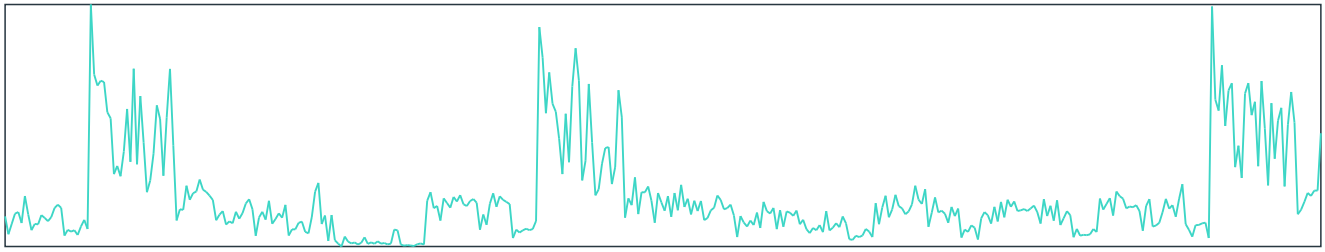
times smaller than Acc champ -> n=40 gold = Pareto teal=single blue=bi purple=tri

Q %

Top Lucy density (LPD)

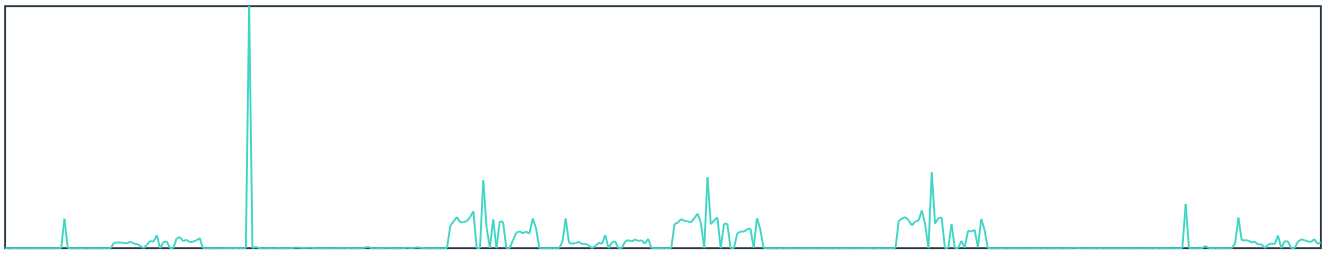


Live pulse (Score)



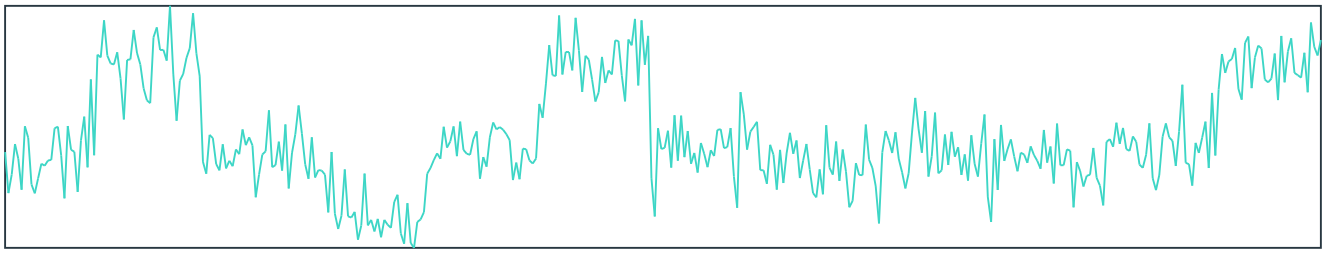
n=400 min=0.00 max=3286.70

Live pulse (SoftAcc)



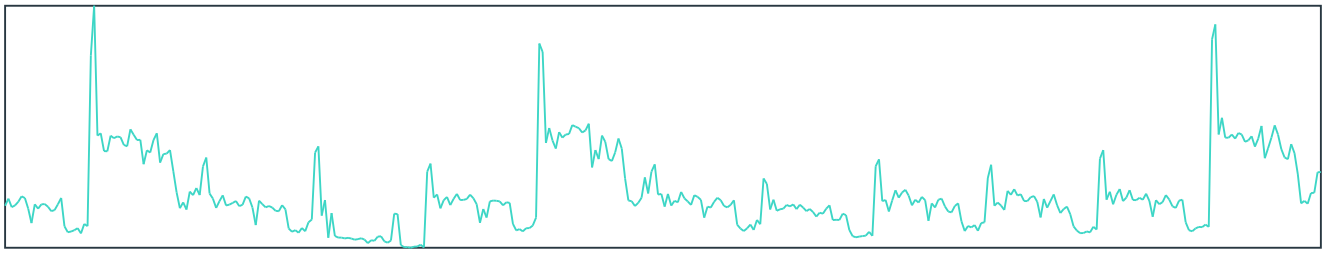
n=400 min=0.00 max=17.04

Live pulse (Availability)



n=400 min=2.75 max=64.86

Live pulse (Throughput)



n=400 min=1215.69 max=36024.43

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	136	0	0	136
MeshBP	136	0	0	136
Mesh[T]	135	0	1	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