tide GPT-char

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 20 - 2026-08-20 22:31:22 - 0.0.0.0:8155
This epoch 986 / 986 cells. Recorded 986 results. Learning rate 20.
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.
live_gpt v1.0.0 - cameralx3 - tinyshakespeare - 4096 windows - seq 32 - causal MHA - A->B->A2 - SIMD

Lucy champions (this tide)

Axis	Cell	Score	Soft	Acc	Thru	Avail
hard acc	complex64|none|tween_chain|tricameral|simd	2.85	6.1	6.1	224.6	20.9
throughput	float32|none|[T][S][L]|tricameral|simd	10.11	0.0	2.7	1104.0	33.6
availability	int|none|[T][S][L]Cache|tricameral|simd	4.68	1.6	2.7	486.8	35.8
lucy score	int8|none|[T][S][L]Cache|tricameral|simd	35.31	4.7	10.1	1030.2	34.0
mobile score (trap)	binary|none|[T][S]Sparse|tricameral|simd	20.27	4.2	6.5	948.5	32.8
acc/sec	int8|none|[T][S][L]Cache|tricameral|simd	35.31	4.7	10.1	1030.2	34.0

Lucy axis champions (this tide)

Axis	Mode	DType	Arch	Value
hard_acc	Step[T][S][L]	int64	tricameralx3	10.20
throughput	[T][S][L]	float32	tricameralx3	1104.04
availability	[T][S][L]Cache	int	tricameralx3	35.81
score	[T][S][L]Cache	int8	tricameralx3	35.31
soft_acc	tween_chain	complex64	tricameralx3	6.06
acc_thru	[T][S][L]Cache	int8	tricameralx3	103.83
realtime	[T][S][L]	float32	tricameralx3	371.46
adapt	Mesh[T]Chain	complex128	tricameralx3	6.82
keep_learn	[T][S][L]Cache	int2	tricameralx3	10.85
acc_per_sec	[T][S][L]Cache	int8	tricameralx3	1.65
consistency	[T][S][L]Cache	fp8e4m3	tricameralx3	7.69
stability	sgd	fp4	tricameralx3	100.00
mobile_score	[T][S]Sparse	binary	tricameralx3	1928.38
lpd	[T][S][L]Cache	int4	tricameralx3	14.77
mspeed	[T][S][L]Cache	int8	tricameralx3	1.00
mavail	[T][S][L]Cache	fp6	tricameralx3	1.00
mix	[T][S][L]Cache	int8	tricameralx3	0.98
gold_std	[T][S][L]Cache	int3	tricameralx3	32.29

Best settings per train mode

Mode	DType	Format	Score	Soft	Acc	Avail	n
[T][S][L]Cache	int8	none	35.3	4.7	10.1	34.0	34
Mesh[T][S]Sparse	int2	none	22.0	4.4	7.3	32.4	34
[T][S]Sparse	ternary	none	20.7	4.2	6.6	32.8	34
[T][S][L]	int8	none	19.6	4.6	6.4	32.4	34
Step[T][S][L]	float32	none	19.1	1.6	8.5	28.5	34
Step[T][S][L]Cache	float32	none	19.1	1.6	9.0	27.7	34
[T][S]	binary	none	11.5	2.3	8.8	23.4	34
Mesh[T][S]	int8	none	11.3	4.7	7.2	24.5	34
[T][S][HP]Async	int8	none	10.3	4.3	6.6	24.6	34
Step[T][S]	float32	none	10.3	1.6	9.4	20.9	34
Step[T][S][HP]	float32	none	10.1	1.6	9.2	21.0	34

Step[T][S][HP]Async	float32	none	10.0	1.6	9.1	21.1	34
Step[T][S]Sparse	float32	none	9.5	1.6	8.6	21.1	34
Step[T][S][FP]	float32	none	9.4	1.6	8.3	21.3	34
step_tween	float32	none	9.2	1.6	8.2	21.0	34
[T][S][FP]	int2	none	8.9	4.8	7.0	22.6	34
step_tween_chain	uint8	none	8.5	4.3	6.2	24.4	34
[T][S][HP]	int2	none	8.0	4.3	6.6	22.0	34
Mesh[T]Chain	int8	none	7.9	4.6	7.3	20.8	34
Mesh[T][S][FP]	int2	none	7.8	4.5	6.4	22.2	34
step_sgd	uint8	none	7.6	3.8	5.6	24.2	34
Mesh[T]	float32	none	7.3	1.6	8.6	18.6	34
MeshBP	int8	none	7.0	4.4	6.9	20.2	34
tween_chain	uint8	none	6.9	4.6	7.5	20.5	34
sgd	uint8	none	6.5	4.4	6.8	20.8	34
tween	float32	none	6.3	1.5	8.1	18.0	34
Step[T]Alt	float32	none	4.2	1.6	8.2	14.9	34
Mesh[T]Alt	float32	none	3.0	0.0	2.7	20.6	34
[T]Alt	float32	none	3.0	0.0	2.6	20.6	34

Best dtype per mode

Mode	Winner dtype	Score	Soft	Acc
[T][S][L]Cache	int8	35.3	4.7	10.1
Mesh[T][S]Sparse	int2	22.0	4.4	7.3
[T][S]Sparse	ternary	20.7	4.2	6.6
[T][S][L]	int8	19.6	4.6	6.4
Step[T][S][L]	float32	19.1	1.6	8.5
Step[T][S][L]Cache	float32	19.1	1.6	9.0
[T][S]	binary	11.5	2.3	8.8
Mesh[T][S]	int8	11.3	4.7	7.2
[T][S][HP]Async	int8	10.3	4.3	6.6
Step[T][S]	float32	10.3	1.6	9.4
Step[T][S][HP]	float32	10.1	1.6	9.2
Step[T][S][HP]Async	float32	10.0	1.6	9.1
Step[T][S]Sparse	float32	9.5	1.6	8.6
Step[T][S][FP]	float32	9.4	1.6	8.3
step_tween	float32	9.2	1.6	8.2
[T][S][FP]	int2	8.9	4.8	7.0
step_tween_chain	uint8	8.5	4.3	6.2
[T][S][HP]	int2	8.0	4.3	6.6
Mesh[T]Chain	int8	7.9	4.6	7.3
Mesh[T][S][FP]	int2	7.8	4.5	6.4
step_sgd	uint8	7.6	3.8	5.6
Mesh[T]	float32	7.3	1.6	8.6
MeshBP	int8	7.0	4.4	6.9
tween_chain	uint8	6.9	4.6	7.5
sgd	uint8	6.5	4.4	6.8
tween	float32	6.3	1.5	8.1
Step[T]Alt	float32	4.2	1.6	8.2
Mesh[T]Alt	float32	3.0	0.0	2.7
[T]Alt	float32	3.0	0.0	2.6

Best mode per dtype

DType	Winner mode	Score	Soft	Acc
int8	[T][S][L]Cache	35.3	4.7	10.1
int4	[T][S][L]Cache	29.5	4.8	8.4
uint8	[T][S][L]Cache	27.7	4.4	8.5
int2	[T][S][L]Cache	27.0	4.3	8.1
ternary	[T][S]Sparse	20.7	4.2	6.6
binary	[T][S]Sparse	20.3	4.2	6.5
float32	Step[T][S][L]	19.1	1.6	8.5
uint64	[T][S][L]Cache	18.0	4.8	8.5
int32	[T][S][L]Cache	17.2	4.7	8.9
uint4	[T][S][L]Cache	17.1	4.5	8.2
uint16	[T][S][L]Cache	16.9	4.6	8.3
uint32	[T][S][L]Cache	16.5	4.7	8.0
int16	[T][S][L]Cache	15.5	4.6	7.7
uint	[T][S][L]Cache	15.2	4.8	8.5
uintptr	[T][S][L]Cache	15.2	4.8	8.8
float64	Step[T][S][L]	14.9	1.6	9.9
bfloat16	Step[T][S][L]	14.6	1.6	9.6
uint2	[T][S]Sparse	12.1	4.1	6.5
nf4	[T][S][L]Cache	12.0	4.5	8.2
int64	Step[T][S][L]	11.4	1.6	10.2
uint3	[T][S][L]Cache	10.3	4.4	8.2
int3	[T][S][L]Cache	10.0	4.5	8.5
fp8e4m3	[T][S][L]Cache	9.9	5.1	5.1
complex128	Step[T][S][L]	9.5	1.6	10.1
float16	Step[T][S][L]Cache	9.4	1.6	8.6
fp8e5m2	Step[T][S][L]Cache	9.3	1.6	8.5
uint5	[T][S][L]Cache	8.5	4.5	7.8
int	Step[T][S][L]Cache	8.4	1.6	9.4
complex64	Step[T][S][L]Cache	8.3	1.6	9.4
int6	[T][S][L]Cache	7.7	4.4	8.5
int5	[T][S][L]Cache	7.7	4.7	7.7
fp6	[T][S][L]Cache	7.5	4.5	7.9
fp4	[T][S][L]	7.3	1.5	2.9
uint6	[T][S][L]Cache	7.1	4.5	7.5

Leaderboard (Lucy Score)

#	Cell	Score	Soft	Acc	Thru	Avail
1	int8|none|[T][S][L]Cache|tricameral|simd	35.3	4.7	10.1	1030.2	34.0
2	int4|none|[T][S][L]Cache|tricameral|simd	29.5	4.8	8.4	1029.1	34.3
3	uint8|none|[T][S][L]Cache|tricameral|simd	27.7	4.4	8.5	936.0	34.8
4	int2|none|[T][S][L]Cache|tricameral|simd	27.0	4.3	8.1	993.2	33.4
5	int2|none|Mesh[T][S]Sparse|tricameral|simd	22.0	4.4	7.3	928.2	32.4
6	ternary|none|[T][S]Sparse|tricameral|simd	20.7	4.2	6.6	959.0	32.8
7	int2|none|[T][S]Sparse|tricameral|simd	20.3	4.3	6.5	959.0	32.8
8	binary|none|[T][S]Sparse|tricameral|simd	20.3	4.2	6.5	948.5	32.8
9	int4|none|Mesh[T][S]Sparse|tricameral|simd	20.1	4.2	6.6	930.6	32.5
10	binary|none|Mesh[T][S]Sparse|tricameral|simd	19.6	4.0	6.1	961.3	33.3
11	int8|none|[T][S][L]|tricameral|simd	19.6	4.6	6.4	951.0	32.4
12	int8|none|Mesh[T][S]Sparse|tricameral|simd	19.6	3.8	5.9	994.0	33.5
13	float32|none|Step[T][S][L]|tricameral|simd	19.1	1.6	8.5	792.8	28.5
14	float32|none|Step[T][S][L]Cache|tricameral|simd	19.1	1.6	9.0	760.9	27.7

15	int4|none|[T][S]Sparse|tricameral|simd	19.1	4.0	5.9	980.4	33.2
16	uint8|none|[T][S]Sparse|tricameral|simd	18.9	4.0	6.4	886.3	33.5
17	int4|none|[T][S][L]|tricameral|simd	18.7	4.5	6.4	920.1	31.9
18	uint8|none|[T][S][L]|tricameral|simd	18.4	4.6	6.8	834.4	32.2
19	uint64|none|[T][S][L]Cache|tricameral|simd	18.0	4.8	8.5	598.3	35.3
20	ternary|none|Mesh[T][S]Sparse|tricameral|simd	17.9	3.7	5.8	943.3	32.8

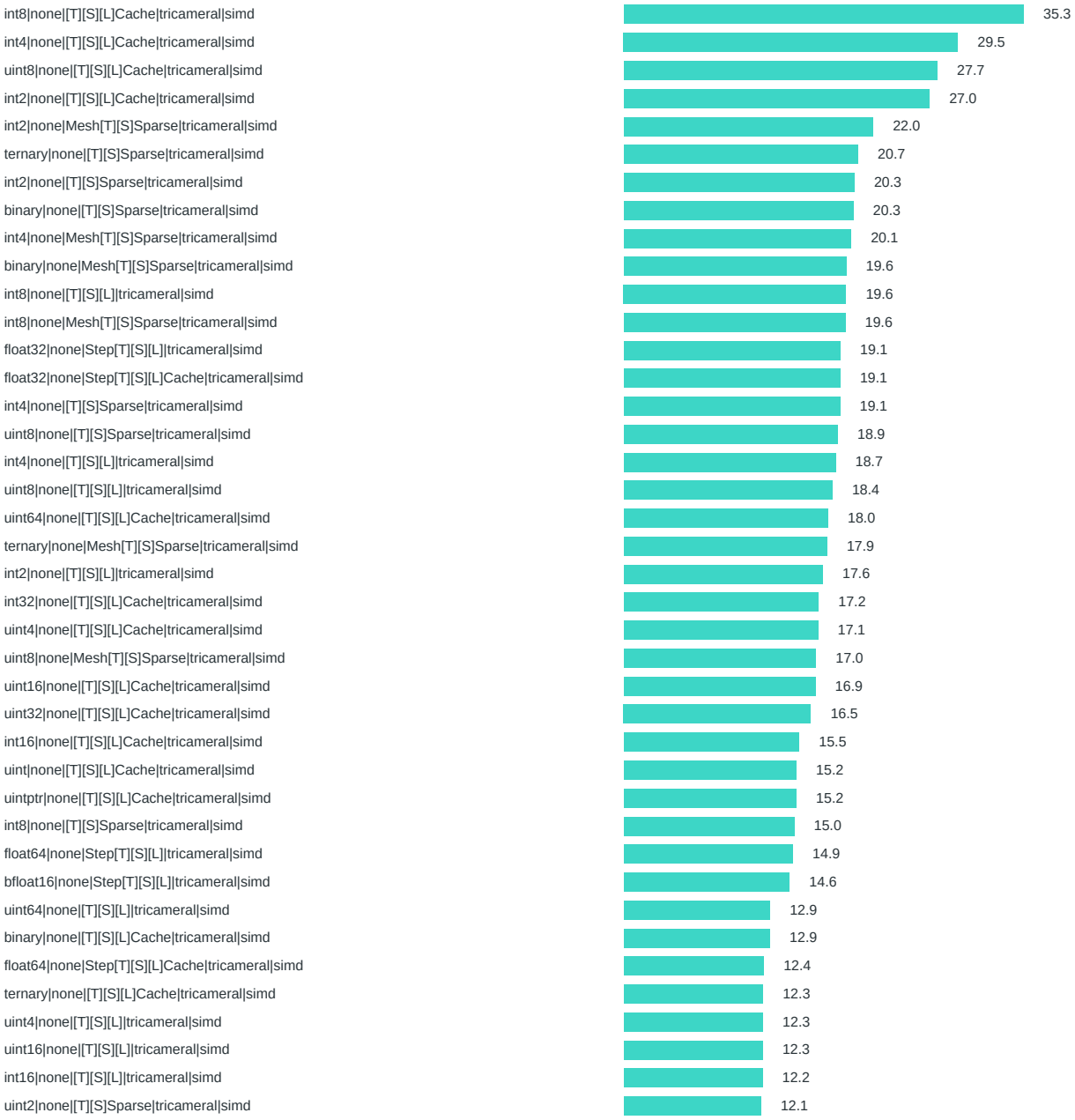
Leaderboard (SoftAcc)

#	Cell	Score	Soft	Acc	Thru	Avail
1	uint|none|[T][S][L]Cache|tricameral|simd	15.2	4.8	8.5	511.9	35.2
2	int4|none|[T][S][L]Cache|tricameral|simd	29.5	4.8	8.4	1029.1	34.3
3	uintptr|none|[T][S][L]Cache|tricameral|simd	15.2	4.8	8.8	500.5	34.6
4	uint64|none|[T][S][L]Cache|tricameral|simd	18.0	4.8	8.5	598.3	35.3
5	uint32|none|[T][S][L]Cache|tricameral|simd	16.5	4.7	8.0	588.2	35.0
6	int32|none|[T][S][L]Cache|tricameral|simd	17.2	4.7	8.9	551.4	35.2
7	int8|none|[T][S][L]Cache|tricameral|simd	35.3	4.7	10.1	1030.2	34.0
8	uint8|none|[T][S][L]|tricameral|simd	18.4	4.6	6.8	834.4	32.2
9	int16|none|[T][S][L]Cache|tricameral|simd	15.5	4.6	7.7	561.4	35.6
10	int8|none|[T][S][L]|tricameral|simd	19.6	4.6	6.4	951.0	32.4
11	uint16|none|[T][S][L]Cache|tricameral|simd	16.9	4.6	8.3	586.5	34.8
12	uint4|none|[T][S][L]Cache|tricameral|simd	17.1	4.5	8.2	590.2	35.4
13	uint64|none|[T][S][L]|tricameral|simd	12.9	4.5	6.7	564.7	33.9
14	int4|none|[T][S][L]|tricameral|simd	18.7	4.5	6.4	920.1	31.9
15	int16|none|[T][S][L]|tricameral|simd	12.2	4.5	7.0	519.7	33.9
16	uint8|none|[T][S][L]Cache|tricameral|simd	27.7	4.4	8.5	936.0	34.8
17	uint16|none|[T][S][L]|tricameral|simd	12.3	4.4	6.5	560.3	33.9
18	uint4|none|[T][S][L]|tricameral|simd	12.3	4.4	6.6	551.2	33.7
19	int2|none|Mesh[T][S]Sparse|tricameral|simd	22.0	4.4	7.3	928.2	32.4
20	int2|none|[T][S][L]Cache|tricameral|simd	27.0	4.3	8.1	993.2	33.4

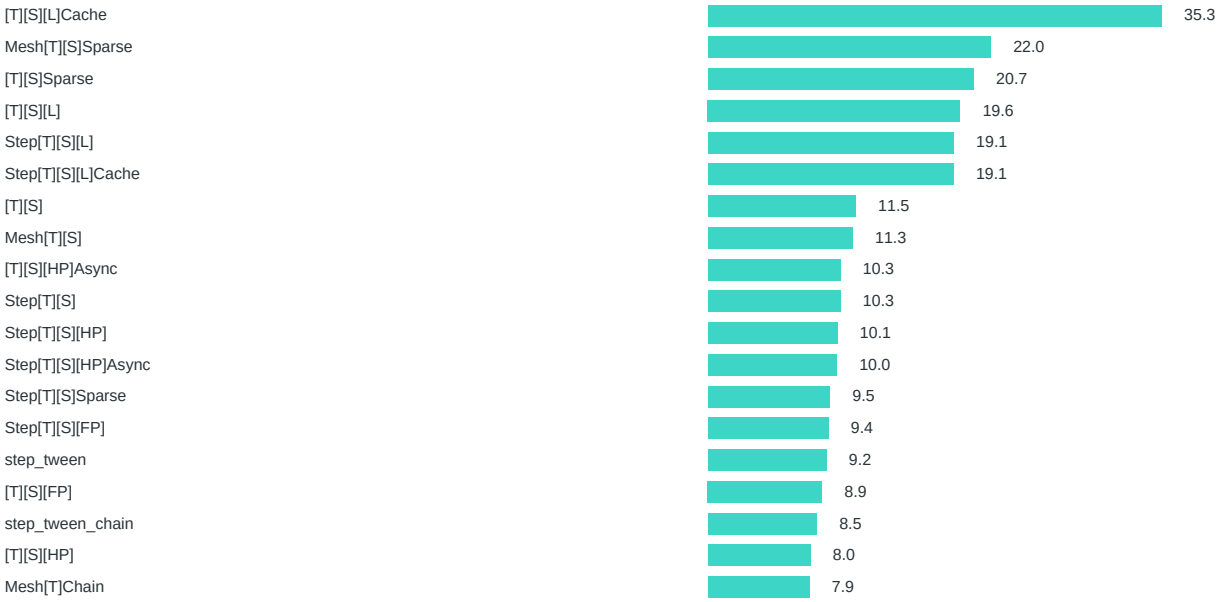
Leaderboard (hard Acc)

#	Cell	Score	Soft	Acc	Thru	Avail
1	int8|none|[T][S][L]Cache|tricameral|simd	35.3	4.7	10.1	1030.2	34.0
2	float64|none|Step[T][S][L]|tricameral|simd	14.9	1.6	9.9	537.4	28.0
3	bfloat16|none|Step[T][S][L]|tricameral|simd	14.6	1.6	9.6	543.3	28.0
4	float32|none|Step[T][S][L]Cache|tricameral|simd	19.1	1.6	9.0	760.9	27.7
5	int32|none|[T][S][L]Cache|tricameral|simd	17.2	4.7	8.9	551.4	35.2
6	uintptr|none|[T][S][L]Cache|tricameral|simd	15.2	4.8	8.8	500.5	34.6
7	uint64|none|[T][S][L]Cache|tricameral|simd	18.0	4.8	8.5	598.3	35.3
8	uint8|none|[T][S][L]Cache|tricameral|simd	27.7	4.4	8.5	936.0	34.8
9	uint|none|[T][S][L]Cache|tricameral|simd	15.2	4.8	8.5	511.9	35.2
10	float32|none|Step[T][S][L]|tricameral|simd	19.1	1.6	8.5	792.8	28.5
11	int4|none|[T][S][L]Cache|tricameral|simd	29.5	4.8	8.4	1029.1	34.3
12	float64|none|Step[T][S][L]Cache|tricameral|simd	12.4	1.6	8.3	532.4	27.9
13	uint16|none|[T][S][L]Cache|tricameral|simd	16.9	4.6	8.3	586.5	34.8
14	uint4|none|[T][S][L]Cache|tricameral|simd	17.1	4.5	8.2	590.2	35.4
15	int2|none|[T][S][L]Cache|tricameral|simd	27.0	4.3	8.1	993.2	33.4
16	uint32|none|[T][S][L]Cache|tricameral|simd	16.5	4.7	8.0	588.2	35.0
17	int16|none|[T][S][L]Cache|tricameral|simd	15.5	4.6	7.7	561.4	35.6
18	int2|none|Mesh[T][S]Sparse|tricameral|simd	22.0	4.4	7.3	928.2	32.4
19	int16|none|[T][S][L]|tricameral|simd	12.2	4.5	7.0	519.7	33.9
20	uint8|none|[T][S][L]|tricameral|simd	18.4	4.6	6.8	834.4	32.2

Top scores



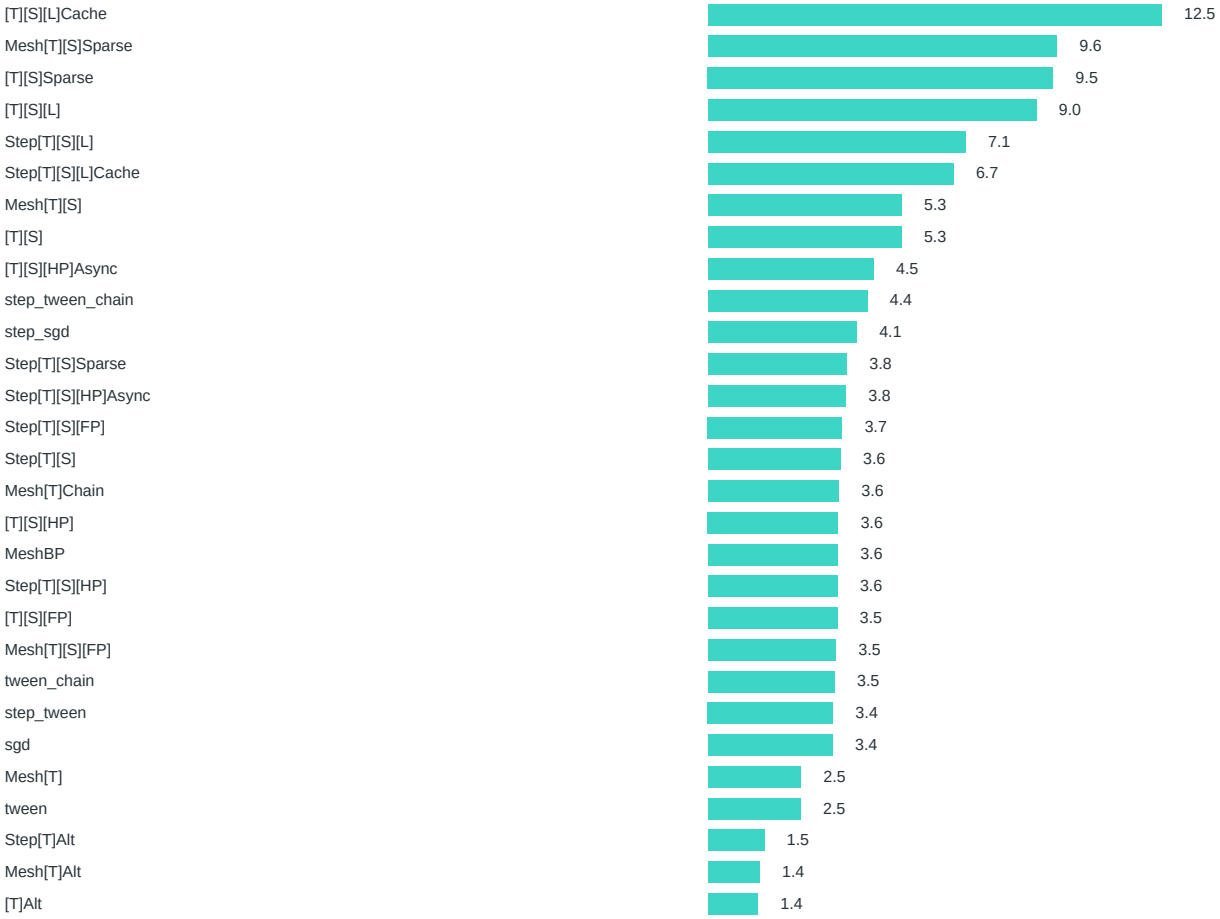
Best settings per mode



Best settings per mode



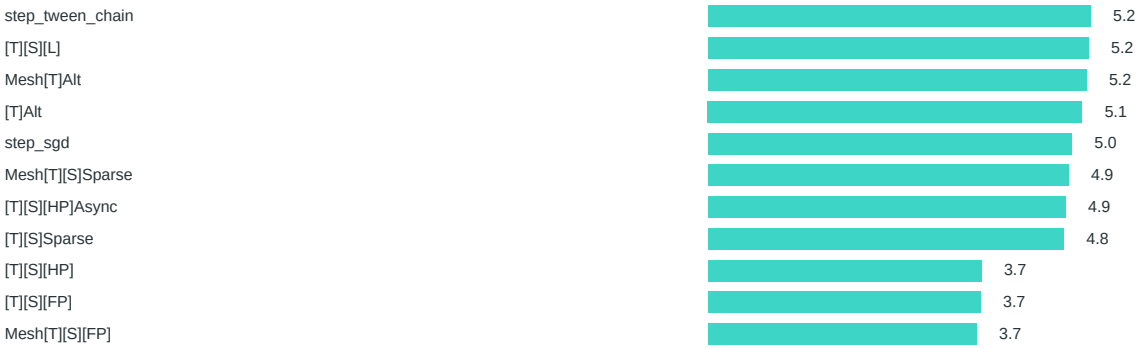
Mean Score by train mode



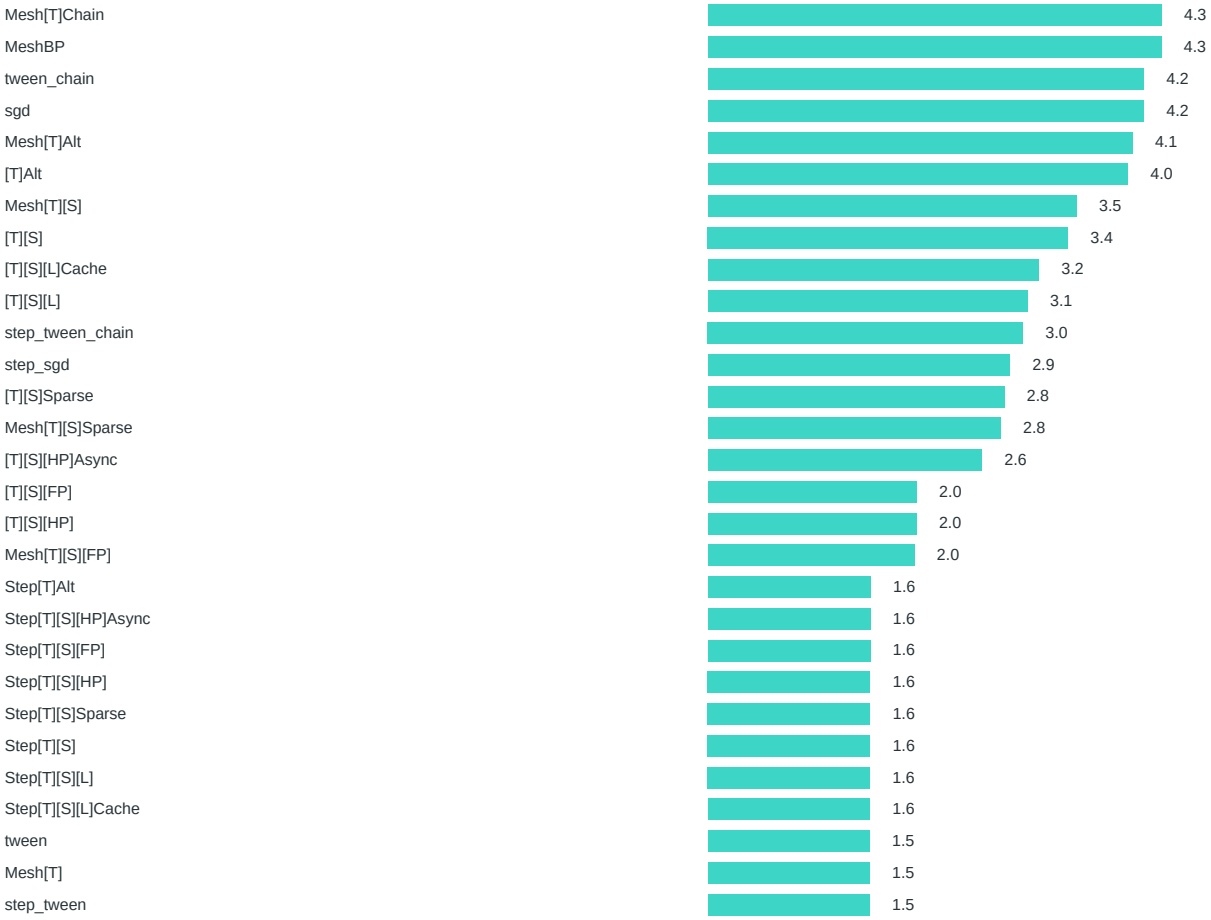
Mean hard Acc by train mode



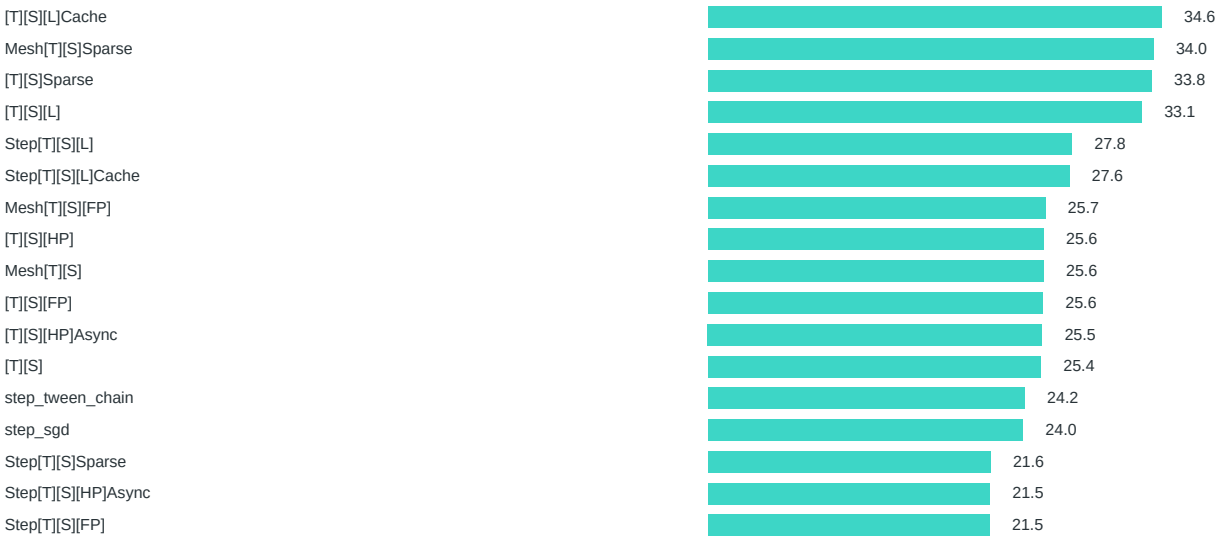
Mean hard Acc by train mode



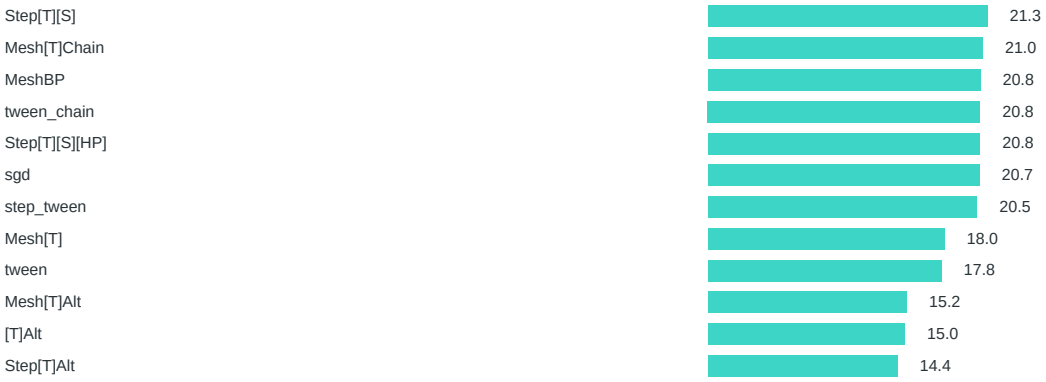
Mean SoftAcc by train mode



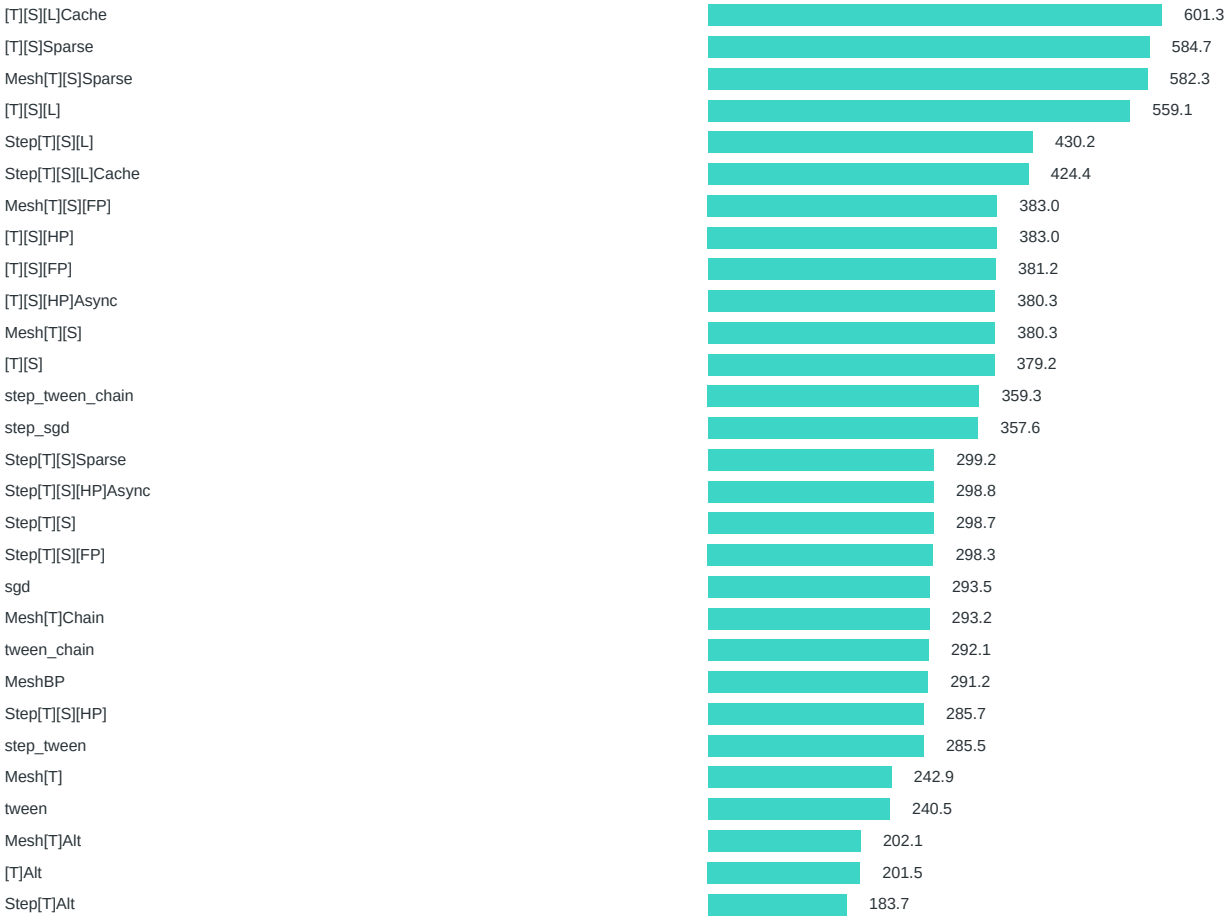
Mean Availability by train mode



Mean Availability by train mode



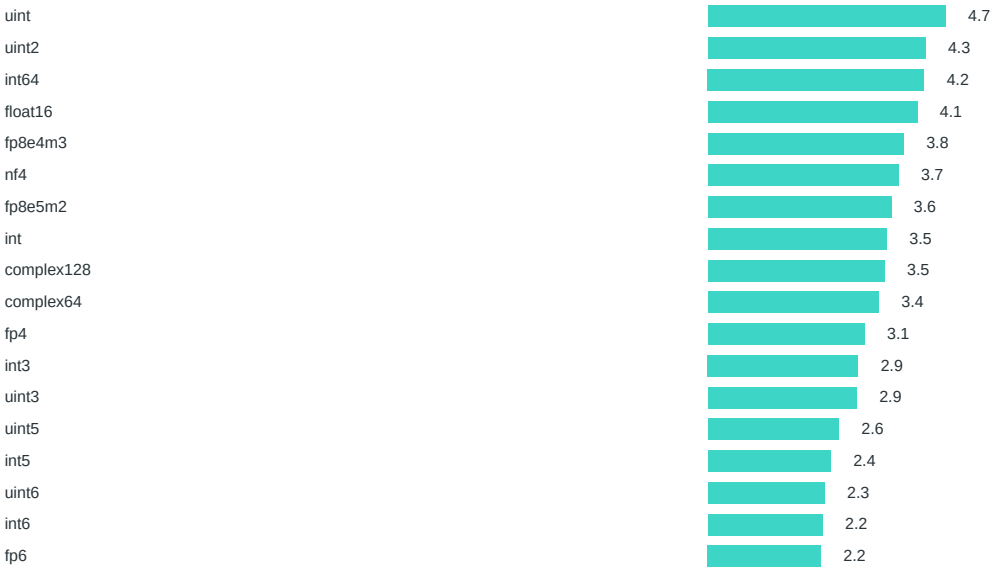
Mean Throughput by train mode



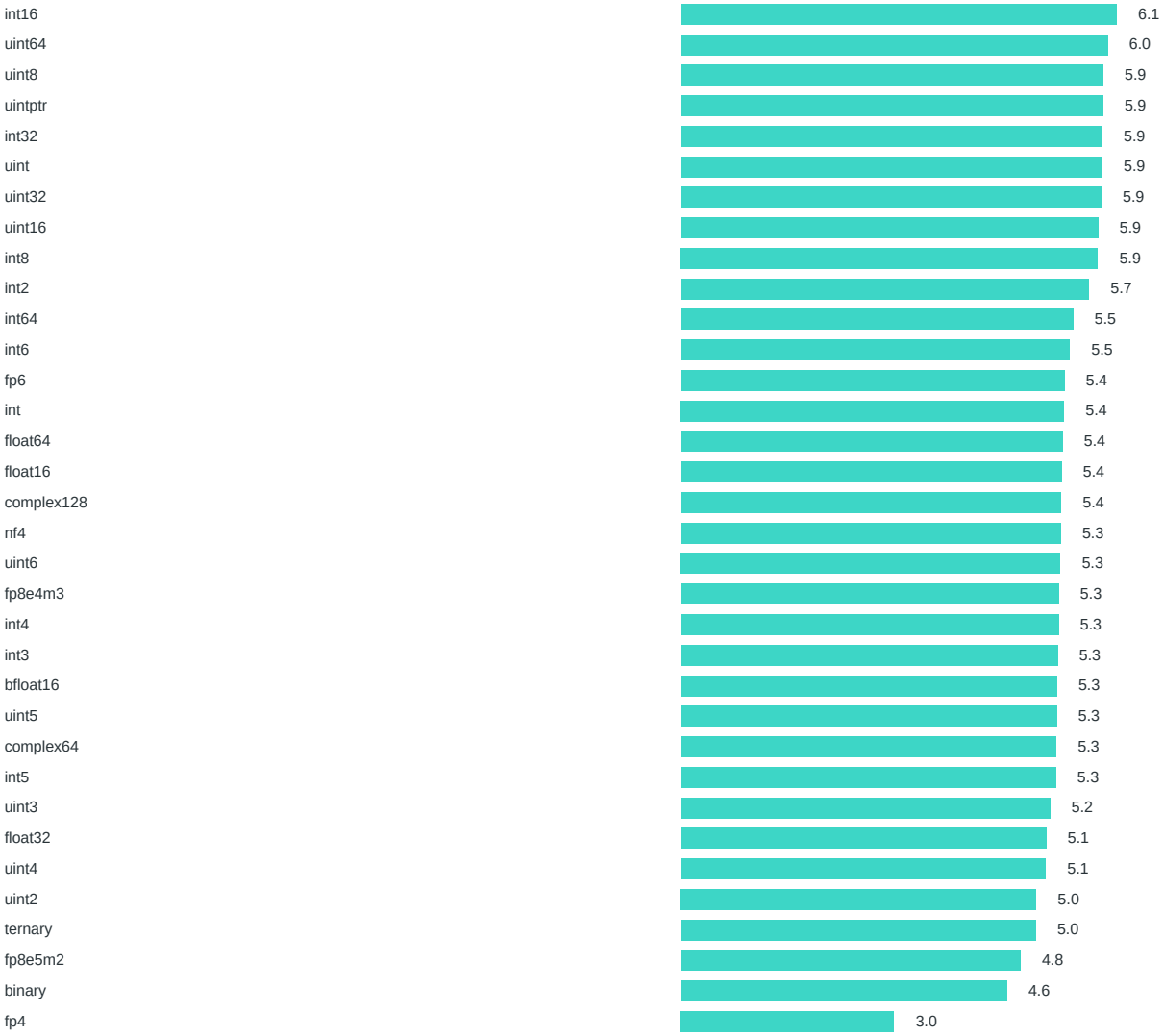
Mean Score by dtype



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

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	4	6	3	4	6	2	2	3	7	3	5	3
Mesh[T]	2	3	1	2	3	1	1	4	4	2	1	3
Mesh[T]Alt	2	1	1	1	2	1	1	1	3	1	2	1
Mesh[T]Chain	4	6	3	4	6	2	1	4	8	3	5	3
Mesh[T][S]	8	5	3	7	5	4	4	5	11	6	8	5
Mesh[T][S][FP]	4	8	3	4	5	2	2	3	7	4	7	3
Mesh[T][S]Sparse	12	22	7	10	20	6	5	5	20	9	18	10
Step[T]Alt	1	1	1	1	1	0	1	2	2	1	1	2
Step[T][S]	4	4	1	3	4	1	1	6	6	2	4	3
Step[T][S][FP]	4	3	2	4	4	1	1	6	5	2	3	4
Step[T][S][HP]	4	3	1	4	4	1	1	5	6	2	2	3
Step[T][S][HP]Async	4	4	1	4	4	1	1	6	6	2	3	3
Step[T][S][L]	7	7	3	6	7	2	2	11	11	3	10	6
Step[T][S][L]Cache	7	8	3	6	8	2	2	9	11	3	7	5
Step[T][S]Sparse	4	4	2	4	3	1	1	6	7	2	3	3
[T]Alt	1	2	1	1	2	1	1	1	2	1	2	1
[T][S]	7	5	3	7	8	3	3	5	9	5	8	6
[T][S][FP]	4	9	3	4	5	2	2	2	9	3	5	3
[T][S][HP]	4	8	4	4	5	2	2	3	7	3	7	3
[T][S][HP]Async	6	9	2	6	7	3	3	2	10	4	5	5
[T][S][L]	12	18	7	11	19	6	5	6	20	9	6	11
[T][S][L]Cache	15	27	10	17	30	8	8	5	35	12	12	15
[T][S]Sparse	10	20	7	11	19	5	5	5	15	9	21	9
sgd	4	6	3	4	6	2	2	1	6	3	5	3
step_sgd	5	7	3	5	7	3	3	2	7	3	7	5
step_tween	4	5	2	3	3	1	1	5	6	2	2	4
step_tween_chain	6	7	3	5	8	2	2	2	8	4	7	5
tween	3	3	1	2	3	1	1	4	5	2	2	3
tween_chain	4	6	2	4	6	2	2	1	6	3	5	3

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	4	4	3	4	4	2	2	4	7	3
Mesh[T]	3	1	1	2	2	1	1	3	5	2
Mesh[T]Alt	1	1	1	1	1	1	1	1	2	1
Mesh[T]Chain	4	3	3	4	4	2	2	4	6	4
Mesh[T][S]	7	7	4	7	7	4	3	7	11	5
Mesh[T][S][FP]	4	4	2	3	4	2	2	4	6	3
Mesh[T][S]Sparse	9	10	6	10	12	6	5	10	17	10
Step[T]Alt	2	1	1	2	1	1	1	2	2	1
Step[T][S]	4	2	2	3	2	1	1	4	5	3
Step[T][S][FP]	4	2	1	4	2	1	1	4	5	3
Step[T][S][HP]	3	2	1	3	3	1	1	4	5	3
Step[T][S][HP]Async	4	2	1	4	2	1	1	4	5	3
Step[T][S][L]	7	5	3	7	5	2	2	7	12	6
Step[T][S][L]Cache	7	5	3	8	5	2	2	7	10	6
Step[T][S]Sparse	4	3	1	4	2	1	2	4	7	3
[T]Alt	1	1	1	1	1	1	1	2	2	1
[T][S]	7	6	4	7	7	4	4	7	10	5
[T][S][FP]	4	5	2	4	4	2	2	4	6	4
[T][S][HP]	4	3	2	4	4	2	2	4	5	3
[T][S][HP]Async	6	6	3	7	6	3	3	6	8	6
[T][S][L]	12	6	8	11	12	7	6	13	18	10
[T][S][L]Cache	17	11	10	17	17	8	7	18	28	15
[T][S]Sparse	12	12	7	12	10	6	5	12	19	10
sgd	4	3	3	4	2	2	2	4	7	3
step_sgd	6	5	3	5	6	2	3	5	8	4
step_tween	3	2	1	3	2	1	1	4	6	4
step_tween_chain	6	5	4	6	5	3	2	6	8	5
tween	2	1	1	3	2	1	1	3	4	2
tween_chain	4	4	2	4	4	2	2	4	7	3

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	3	6	5	5	6	5	6	3	5	6	5	4
Mesh[T]	9	5	9	9	7	9	8	2	5	8	6	10
Mesh[T]Alt	3	7	3	3	3	3	3	4	6	5	3	4
Mesh[T]Chain	6	7	6	5	6	3	5	3	7	5	6	2
Mesh[T][S]	2	7	2	3	3	2	3	5	7	5	3	6
Mesh[T][S][FP]	2	3	3	2	3	2	3	2	4	3	2	3
Mesh[T][S]Sparse	3	6	3	3	3	3	3	3	6	3	3	3
Step[T]Alt	10	3	8	9	10	8	9	2	4	8	7	9
Step[T][S]	10	3	8	8	8	9	8	3	4	7	7	9
Step[T][S][FP]	7	3	10	8	9	8	9	3	5	7	9	9
Step[T][S][HP]	9	3	8	10	9	9	8	3	5	8	8	8
Step[T][S][HP]Async	10	3	9	9	9	9	9	3	4	9	8	10
Step[T][S][L]	10	3	10	8	7	8	10	3	4	7	8	9
Step[T][S][L]Cache	8	2	9	9	9	9	8	3	5	8	8	9
Step[T][S]Sparse	9	2	10	9	9	9	9	3	4	8	8	9
[T]Alt	2	7	3	3	3	3	3	4	6	5	3	5
[T][S]	3	9	3	3	3	2	3	5	8	5	2	5
[T][S][FP]	3	2	3	3	3	3	2	3	4	3	3	3
[T][S][HP]	3	3	2	3	3	3	3	3	4	3	3	2
[T][S][HP]Async	4	4	3	2	3	2	3	3	5	3	3	2
[T][S][L]	3	3	3	3	3	3	3	3	6	5	2	3
[T][S][L]Cache	3	4	2	3	3	3	3	2	8	5	2	3
[T][S]Sparse	3	7	2	2	2	2	3	3	5	3	3	3
sgd	3	6	5	5	5	5	5	3	7	5	6	5
step_sgd	2	6	2	3	2	3	3	3	7	2	2	3
step_tween	10	3	8	8	8	8	9	3	4	6	6	8
step_tween_chain	3	6	3	3	3	3	3	3	7	3	3	2
tween	9	5	8	9	9	8	10	3	4	7	7	6
tween_chain	5	6	5	6	5	5	5	2	6	3	5	3

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	7	7	7	7	7	7	7	5	7	7	7	6
Mesh[T]	5	5	5	5	5	5	3	8	5	5	2	6
Mesh[T]Alt	6	5	6	7	6	6	7	4	7	6	7	6
Mesh[T]Chain	6	7	7	7	7	6	5	6	7	7	7	6
Mesh[T][S]	7	4	5	8	4	8	8	5	7	8	7	6
Mesh[T][S][FP]	4	6	5	4	4	4	4	3	4	5	5	4
Mesh[T][S]Sparse	7	7	6	6	7	6	6	3	6	6	6	6
Step[T]Alt	4	4	4	5	4	3	4	9	5	3	4	6
Step[T][S]	7	4	4	6	4	4	5	10	5	4	4	6
Step[T][S][FP]	6	4	4	6	4	4	4	9	5	3	3	6
Step[T][S][HP]	7	5	4	6	5	5	5	9	6	4	3	6
Step[T][S][HP]Async	6	4	4	5	4	4	4	10	6	4	4	6
Step[T][S][L]	6	4	4	6	4	4	4	10	5	4	5	5
Step[T][S][L]Cache	6	4	4	6	4	4	4	8	5	4	4	5
Step[T][S]Sparse	6	5	4	6	4	4	5	9	6	4	4	5
[T]Alt	6	5	5	6	5	6	6	4	6	6	6	6
[T][S]	7	4	5	7	6	7	7	5	6	7	7	7
[T][S][FP]	4	7	5	4	4	4	4	3	6	4	4	3
[T][S][HP]	4	7	6	4	4	4	4	3	4	5	5	4
[T][S][HP]Async	6	7	4	6	5	6	7	2	7	6	4	6
[T][S][L]	7	6	7	6	6	7	7	3	6	7	3	7
[T][S][L]Cache	8	8	9	9	8	8	8	2	10	8	4	8
[T][S]Sparse	6	6	6	6	6	6	6	2	5	6	7	5
sgd	6	7	7	7	7	7	6	2	6	6	6	6
step_sgd	7	7	6	7	6	6	7	3	5	5	7	7
step_tween	6	6	5	5	4	5	4	8	6	4	3	7
step_tween_chain	7	6	6	6	7	6	5	3	6	7	7	7
tween	6	5	5	5	5	6	5	9	6	5	5	7
tween_chain	7	7	6	7	7	6	7	2	6	6	6	6

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	6	7	7	7	7	7	6	7	7	6
Mesh[T]	6	3	5	6	4	5	4	6	6	6
Mesh[T]Alt	6	6	6	6	6	6	6	6	6	6
Mesh[T]Chain	6	6	6	6	7	6	7	7	6	7
Mesh[T][S]	7	7	7	7	7	7	7	7	7	6
Mesh[T][S][FP]	4	5	4	4	4	4	4	4	4	4
Mesh[T][S]Sparse	5	6	5	5	6	6	6	5	6	6
Step[T]Alt	6	3	4	6	4	4	4	6	5	5
Step[T][S]	6	3	4	5	3	4	5	5	5	6
Step[T][S][FP]	7	4	3	6	3	4	4	6	5	6
Step[T][S][HP]	5	4	4	5	4	4	5	6	6	5
Step[T][S][HP]Async	6	4	3	6	4	4	4	5	5	6
Step[T][S][L]	6	5	4	6	4	3	4	6	6	6
Step[T][S][L]Cache	6	5	4	7	4	4	3	5	6	6
Step[T][S]Sparse	6	4	4	5	3	4	5	5	7	6
[T]Alt	6	6	7	6	6	6	6	7	6	6
[T][S]	7	6	7	7	7	7	8	7	7	7
[T][S][FP]	4	6	4	4	4	4	4	5	4	5
[T][S][HP]	4	3	4	4	5	4	4	4	4	4
[T][S][HP]Async	6	7	6	7	6	7	6	6	5	7
[T][S][L]	6	3	7	6	7	8	7	7	7	6
[T][S][L]Cache	8	6	8	8	8	8	7	9	8	9
[T][S]Sparse	6	7	6	6	5	6	5	6	6	6
sgd	7	5	7	6	3	7	7	7	7	6
step_sgd	7	6	5	6	7	5	6	5	6	5
step_tween	5	4	4	5	4	4	4	6	6	6
step_tween_chain	7	7	7	6	6	7	5	7	6	6
tween	5	2	5	7	4	4	4	6	5	6
tween_chain	7	7	5	7	7	7	7	7	7	6

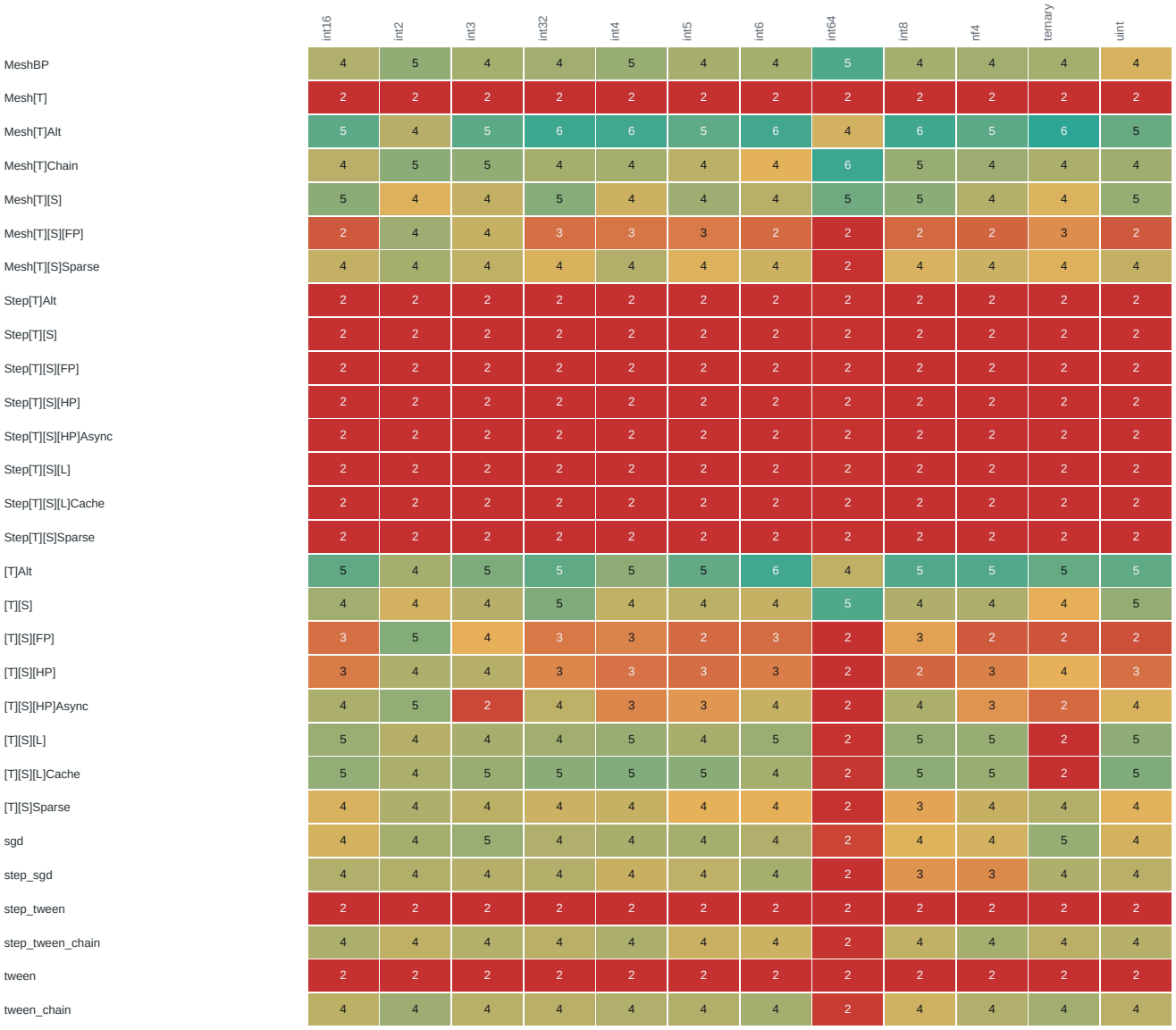
Honesty - mean SoftAcc, every mode x dtype (cols 1-12)

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

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

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	4	5	4	4	5	4	4	5	4	4	4	4
Mesh[T]	2	2	2	2	2	2	2	2	2	2	2	2
Mesh[T]Alt	5	4	5	6	6	5	6	4	6	5	6	5
Mesh[T]Chain	4	5	5	4	4	4	4	6	5	4	4	4
Mesh[T][S]	5	4	4	5	4	4	4	5	5	4	4	5
Mesh[T][S][FP]	2	4	4	3	3	3	2	2	2	2	3	2
Mesh[T][S]Sparse	4	4	4	4	4	4	4	2	4	4	4	4
Step[T]Alt	2	2	2	2	2	2	2	2	2	2	2	2
Step[T][S]	2	2	2	2	2	2	2	2	2	2	2	2
Step[T][S][FP]	2	2	2	2	2	2	2	2	2	2	2	2
Step[T][S][HP]	2	2	2	2	2	2	2	2	2	2	2	2
Step[T][S][HP]Async	2	2	2	2	2	2	2	2	2	2	2	2
Step[T][S][L]	2	2	2	2	2	2	2	2	2	2	2	2
Step[T][S][L]Cache	2	2	2	2	2	2	2	2	2	2	2	2
Step[T][S]Sparse	2	2	2	2	2	2	2	2	2	2	2	2
[T]Alt	5	4	5	5	5	5	6	4	5	5	5	5
[T][S]	4	4	4	5	4	4	4	5	4	4	4	5
[T][S][FP]	3	5	4	3	3	2	3	2	3	2	2	2
[T][S][HP]	3	4	4	3	3	3	3	2	2	3	4	3
[T][S][HP]Async	4	5	2	4	3	3	4	2	4	3	2	4
[T][S][L]	5	4	4	4	5	4	5	2	5	5	2	5
[T][S][L]Cache	5	4	5	5	5	5	4	2	5	5	2	5
[T][S]Sparse	4	4	4	4	4	4	4	2	3	4	4	4
sgd	4	4	5	4	4	4	4	2	4	4	5	4
step_sgd	4	4	4	4	4	4	4	2	3	3	4	4
step_tween	2	2	2	2	2	2	2	2	2	2	2	2
step_tween_chain	4	4	4	4	4	4	4	2	4	4	4	4
tween	2	2	2	2	2	2	2	2	2	2	2	2
tween_chain	4	4	4	4	4	4	4	2	4	4	4	4

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	4	4	4	4	5	5	4	4	4	4
Mesh[T]	2	2	2	2	2	2	2	2	2	2
Mesh[T]Alt	5	5	5	6	5	5	5	5	5	5
Mesh[T]Chain	4	4	4	4	5	4	5	4	4	5
Mesh[T][S]	5	4	4	5	4	4	4	5	5	4
Mesh[T][S][FP]	2	3	3	3	3	3	2	2	3	2
Mesh[T][S]Sparse	4	4	4	3	4	4	4	3	4	4
Step[T]Alt	2	2	2	2	2	2	2	2	2	2
Step[T][S]	2	2	2	2	2	2	2	2	2	2
Step[T][S][FP]	2	2	2	2	2	2	2	2	2	2
Step[T][S][HP]	2	2	2	2	2	2	2	2	2	2
Step[T][S][HP]Async	2	2	2	2	2	2	2	2	2	2
Step[T][S][L]	2	2	2	2	2	2	2	2	2	2
Step[T][S][L]Cache	2	2	2	2	2	2	2	2	2	2
Step[T][S]Sparse	2	2	2	2	2	2	2	2	2	2
[T]Alt	6	5	6	5	5	5	5	5	5	5
[T][S]	5	4	4	5	4	4	4	5	5	5
[T][S][FP]	3	3	3	3	2	3	3	3	2	2
[T][S][HP]	3	2	3	3	3	2	3	2	2	2
[T][S][HP]Async	4	4	3	4	4	4	3	4	3	4
[T][S][L]	4	2	4	4	4	5	5	5	5	4
[T][S][L]Cache	5	2	4	5	5	4	5	5	4	5
[T][S]Sparse	4	4	4	4	4	4	4	4	4	4
sgd	4	4	5	4	2	4	4	5	4	4
step_sgd	4	4	3	4	4	4	4	3	4	4
step_tween	2	2	2	2	2	2	2	2	2	2
step_tween_chain	4	4	4	4	4	4	3	4	4	4
tween	2	2	2	2	2	2	2	2	2	2
tween_chain	4	4	4	4	4	4	4	4	5	4

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	20	18	21	22	20	21	22	20	22	21	21	21
Mesh[T]	18	15	19	19	19	19	18	18	18	19	18	19
Mesh[T]Alt	21	11	21	20	21	21	20	13	14	14	20	16
Mesh[T]Chain	21	18	21	22	20	21	22	20	22	21	21	22
Mesh[T][S]	25	23	27	27	26	25	25	24	27	26	26	27
Mesh[T][S][FP]	24	23	27	28	26	25	26	25	27	26	26	26
Mesh[T][S]Sparse	34	33	34	34	34	33	34	33	35	34	34	34
Step[T]Alt	14	12	15	16	15	15	15	13	15	15	14	15
Step[T][S]	21	19	22	21	22	21	21	20	22	22	21	22
Step[T][S][FP]	21	19	23	23	22	21	22	20	22	23	21	22
Step[T][S][HP]	20	17	21	22	21	21	22	19	22	22	21	21
Step[T][S][HP]Async	21	19	22	22	22	21	22	20	22	23	21	23
Step[T][S][L]	28	28	28	29	28	29	28	27	27	28	28	29
Step[T][S][L]Cache	27	27	28	27	28	28	28	27	28	28	28	28
Step[T][S]Sparse	21	19	22	22	22	21	22	20	22	23	21	22
[T]Alt	21	11	21	21	21	21	20	12	14	14	21	16
[T][S]	24	23	26	27	26	24	25	23	26	27	25	26
[T][S][FP]	25	23	27	26	26	24	25	24	27	25	26	26
[T][S][HP]	25	23	26	27	26	25	25	24	27	26	26	26
[T][S][HP]Async	25	23	27	26	25	24	26	25	27	26	25	27
[T][S][L]	33	29	34	34	34	34	34	34	33	33	33	36
[T][S][L]Cache	33	34	34	34	34	33	34	34	36	36	34	36
[T][S]Sparse	34	33	35	34	34	33	34	33	34	34	34	34
sgd	20	19	22	21	21	20	20	19	21	21	21	22
step_sgd	23	22	24	25	24	23	25	23	25	24	24	25
step_tween	20	17	22	22	20	21	21	19	21	21	20	21
step_tween_chain	23	21	25	25	24	24	24	22	25	24	24	25
tween	17	16	18	18	19	18	18	17	18	17	18	18
tween_chain	21	17	22	21	21	21	22	20	21	21	22	21

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	21	19	22	22	19	20	21	22	20	22	18	21
Mesh[T]	19	16	19	18	17	19	18	19	18	19	15	19
Mesh[T]Alt	15	11	14	14	12	14	14	16	13	14	12	14
Mesh[T]Chain	22	18	22	21	19	21	22	22	21	21	18	22
Mesh[T][S]	27	22	26	26	22	27	26	26	25	26	22	26
Mesh[T][S][FP]	27	22	27	27	23	27	27	26	25	27	23	26
Mesh[T][S]Sparse	34	32	35	35	32	35	35	34	34	34	33	34
Step[T]Alt	15	12	15	15	13	15	15	15	14	15	11	15
Step[T][S]	21	19	22	22	20	22	22	22	21	21	19	22
Step[T][S][FP]	22	19	22	22	20	22	22	22	20	21	19	22
Step[T][S][HP]	22	18	21	21	19	21	21	22	20	21	18	22
Step[T][S][HP]Async	22	19	22	23	20	22	22	23	21	22	19	22
Step[T][S][L]	28	26	27	28	28	28	27	28	28	28	27	29
Step[T][S][L]Cache	28	26	27	28	27	28	27	28	28	27	26	28
Step[T][S]Sparse	23	19	22	22	19	22	22	22	21	21	19	22
[T]Alt	14	12	14	13	12	14	14	16	13	14	11	14
[T][S]	27	22	27	27	23	26	26	27	25	26	22	26
[T][S][FP]	27	23	27	26	23	27	27	26	24	26	22	26
[T][S][HP]	26	22	27	27	23	27	27	26	25	26	23	26
[T][S][HP]Async	27	22	27	26	23	26	26	26	25	26	22	26
[T][S][L]	34	31	33	34	32	33	33	35	32	33	29	33
[T][S][L]Cache	36	33	35	35	34	35	35	36	34	34	33	35
[T][S]Sparse	34	33	34	34	33	34	34	34	33	34	33	34
sgd	22	18	22	21	19	21	22	21	21	21	18	21
step_sgd	25	20	25	25	21	25	24	25	24	24	20	25
step_tween	22	18	21	22	18	21	21	21	21	21	17	21
step_tween_chain	26	21	25	25	22	25	25	25	24	25	21	25
tween	18	16	18	19	17	18	19	18	18	18	15	18
tween_chain	21	19	21	21	19	21	21	21	20	20	18	21

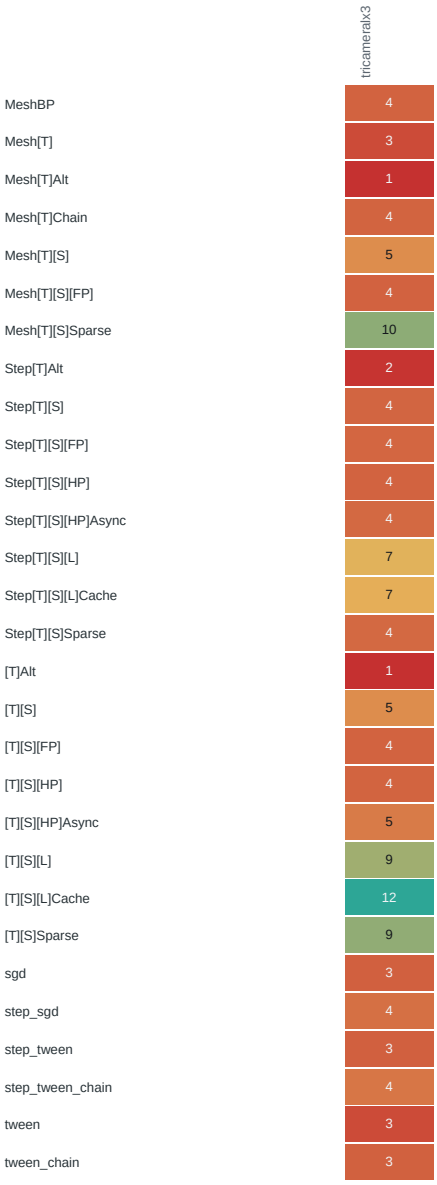
Honesty - mean Avail, every mode x dtype (cols 25-34)

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

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	21	21	21	21	21	21	21	21	21	21
Mesh[T]	18	18	18	18	19	18	18	19	18	18
Mesh[T]Alt	14	14	14	14	14	14	14	14	13	13
Mesh[T]Chain	22	21	22	21	21	22	22	22	21	21
Mesh[T][S]	26	26	27	26	26	26	26	26	25	27
Mesh[T][S][FP]	26	26	27	26	27	27	27	26	25	26
Mesh[T][S]Sparse	34	34	34	34	34	34	35	34	33	34
Step[T]Alt	15	14	15	15	15	14	15	15	14	15
Step[T][S]	21	20	22	22	21	22	22	22	21	22
Step[T][S][FP]	22	21	22	22	21	22	22	22	21	22
Step[T][S][HP]	21	20	21	22	21	21	21	21	21	21
Step[T][S][HP]Async	22	22	22	22	22	22	22	22	22	22
Step[T][S][L]	28	27	28	28	28	28	27	28	28	28
Step[T][S][L]Cache	28	28	27	28	28	27	28	28	28	28
Step[T][S]Sparse	22	22	22	22	22	22	22	22	22	22
[T]Alt	13	13	14	14	13	14	14	14	13	14
[T][S]	26	26	26	26	26	26	26	25	25	26
[T][S][FP]	26	26	26	26	26	26	27	25	26	27
[T][S][HP]	26	26	27	26	26	26	27	26	25	26
[T][S][HP]Async	26	25	26	26	26	26	26	26	26	26
[T][S][L]	34	33	33	33	34	33	33	34	32	33
[T][S][L]Cache	35	35	35	35	35	35	35	35	35	35
[T][S]Sparse	34	34	34	35	34	35	34	34	33	34
sgd	21	21	22	21	21	21	21	21	21	21
step_sgd	25	24	25	24	24	25	25	25	24	25
step_tween	21	21	20	21	20	21	21	22	21	22
step_tween_chain	25	24	25	25	24	25	25	25	24	25
tween	18	18	18	19	18	18	18	18	18	18
tween_chain	20	21	21	21	21	22	21	21	21	21

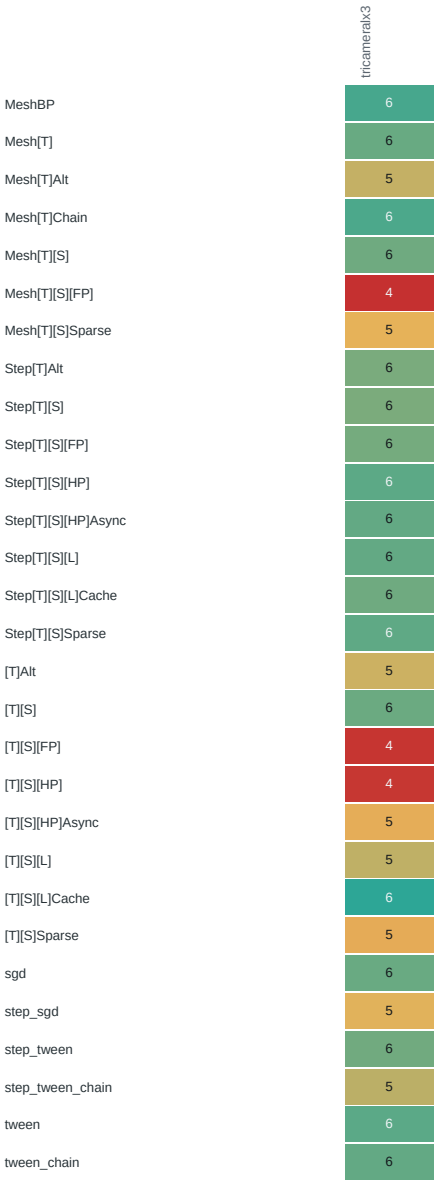
Mean Score, every mode x arch

Mean Score, every mode x arch



Mean hard Acc, every mode x arch

Mean hard Acc, every mode x arch

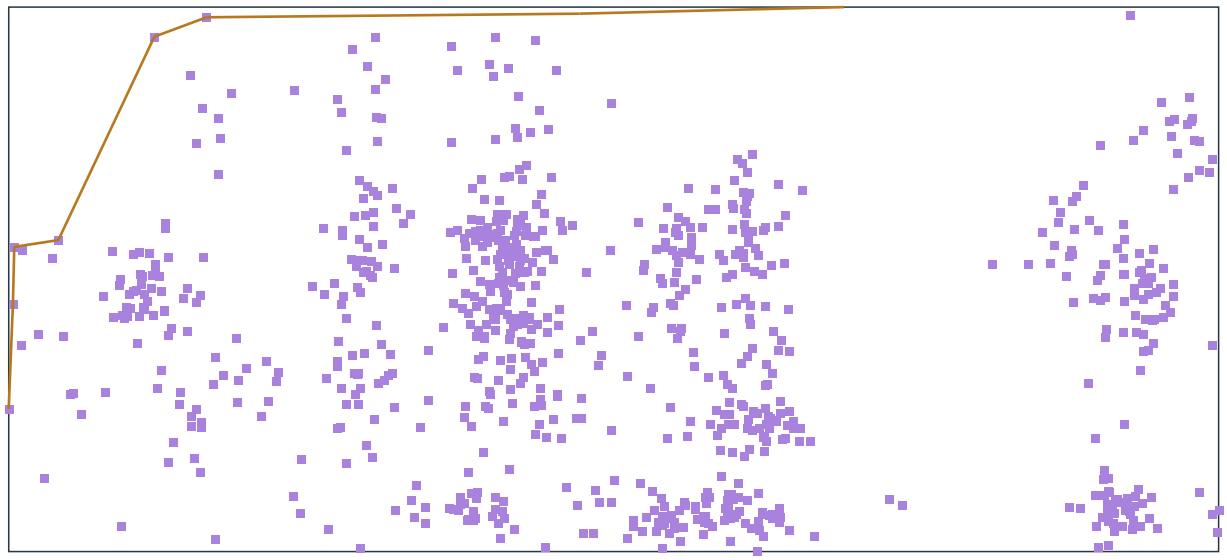


Mean Avail, every mode x arch

Mean Avail, every mode x arch

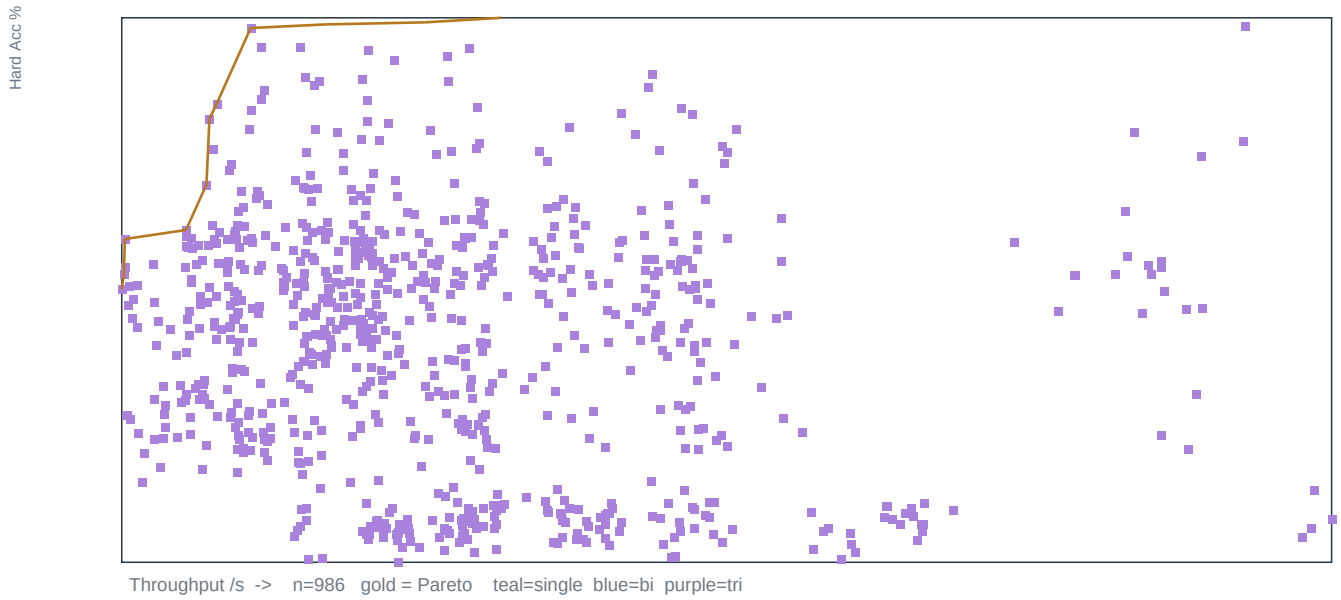
	tricamerarx3
MeshBP	21
Mesh[T]	18
Mesh[T]Alt	15
Mesh[T]Chain	21
Mesh[T][S]	26
Mesh[T][S][FP]	26
Mesh[T][S]Sparse	34
Step[T]Alt	14
Step[T][S]	21
Step[T][S][FP]	21
Step[T][S][HP]	21
Step[T][S][HP]Async	22
Step[T][S][L]	28
Step[T][S][L]Cache	28
Step[T][S]Sparse	22
[T]Alt	15
[T][S]	25
[T][S][FP]	26
[T][S][HP]	26
[T][S][HP]Async	25
[T][S][L]	33
[T][S][L]Cache	35
[T][S]Sparse	34
sgd	21
step_sgd	24
step_tween	21
step_tween_chain	24
tween	18
tween_chain	21

Pillars - Availability vs hard Acc

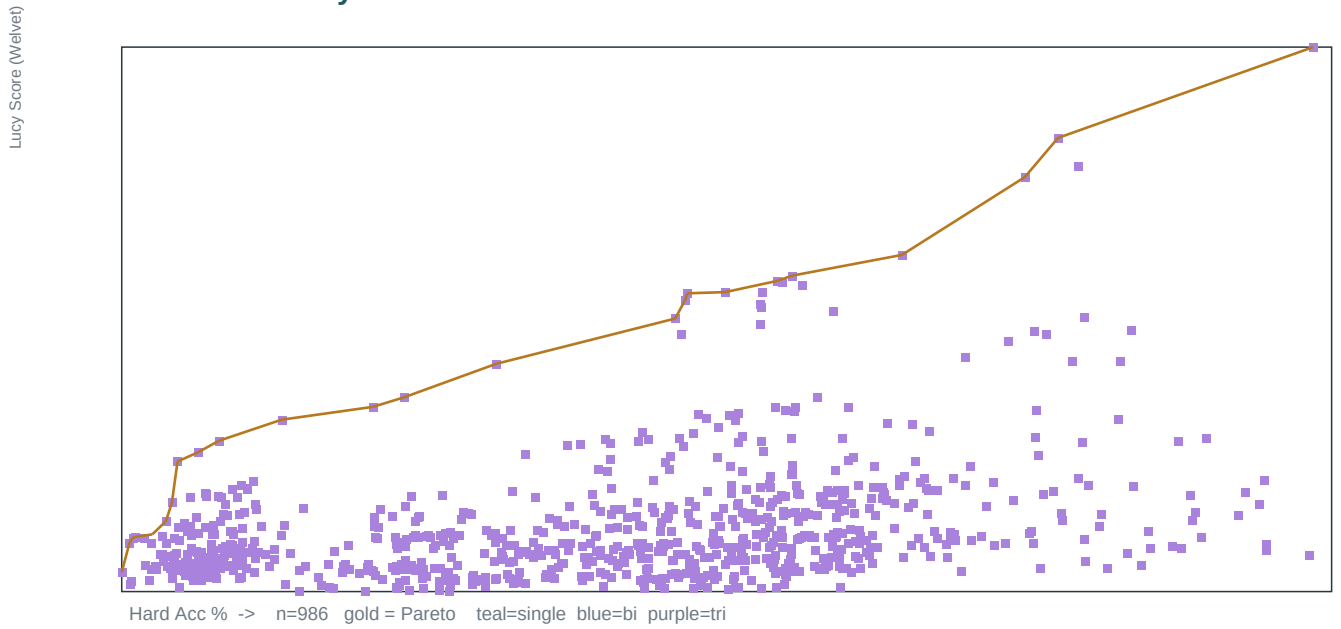



Availability % -> n=986 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

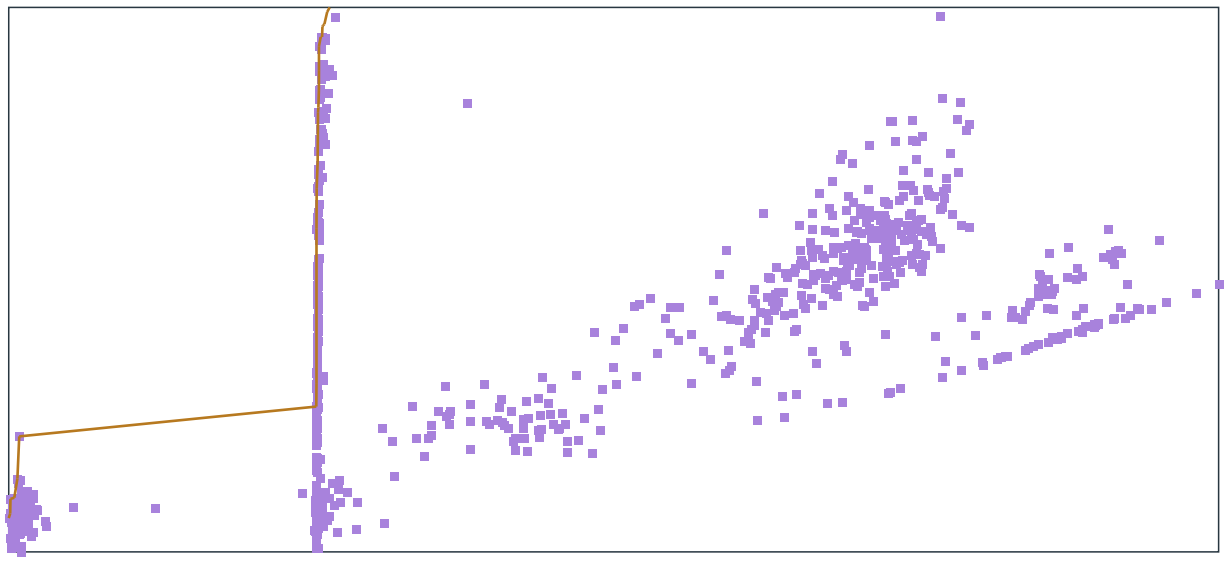
Pillars - Throughput vs hard Acc



Pareto - hard Acc vs Lucy Score

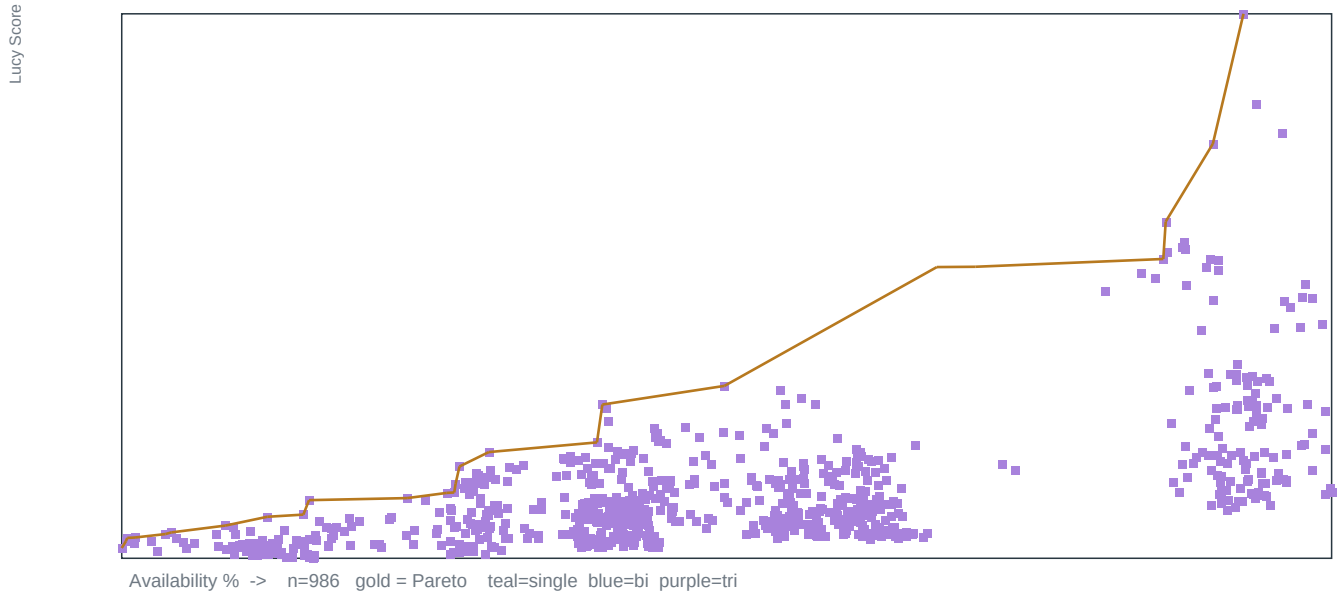


SoftAcc (serve-confidence) vs hard Acc




SoftAcc % -> n=986 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

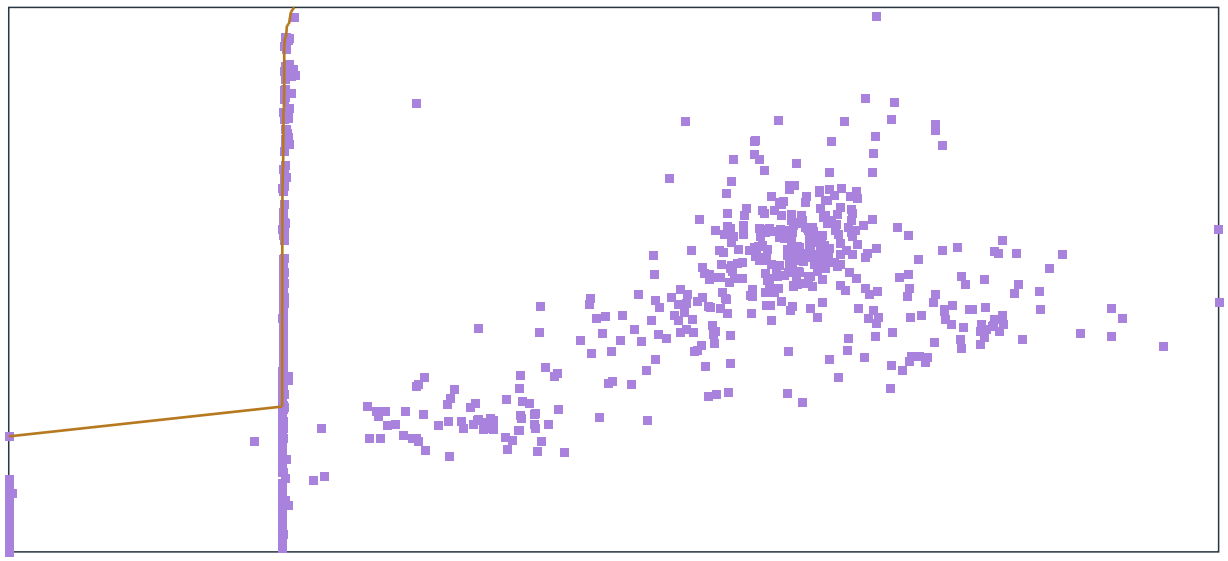
Avail vs Lucy Score (duty clock)



Pillars - Throughput vs Availability



AdaptPct vs hard Acc



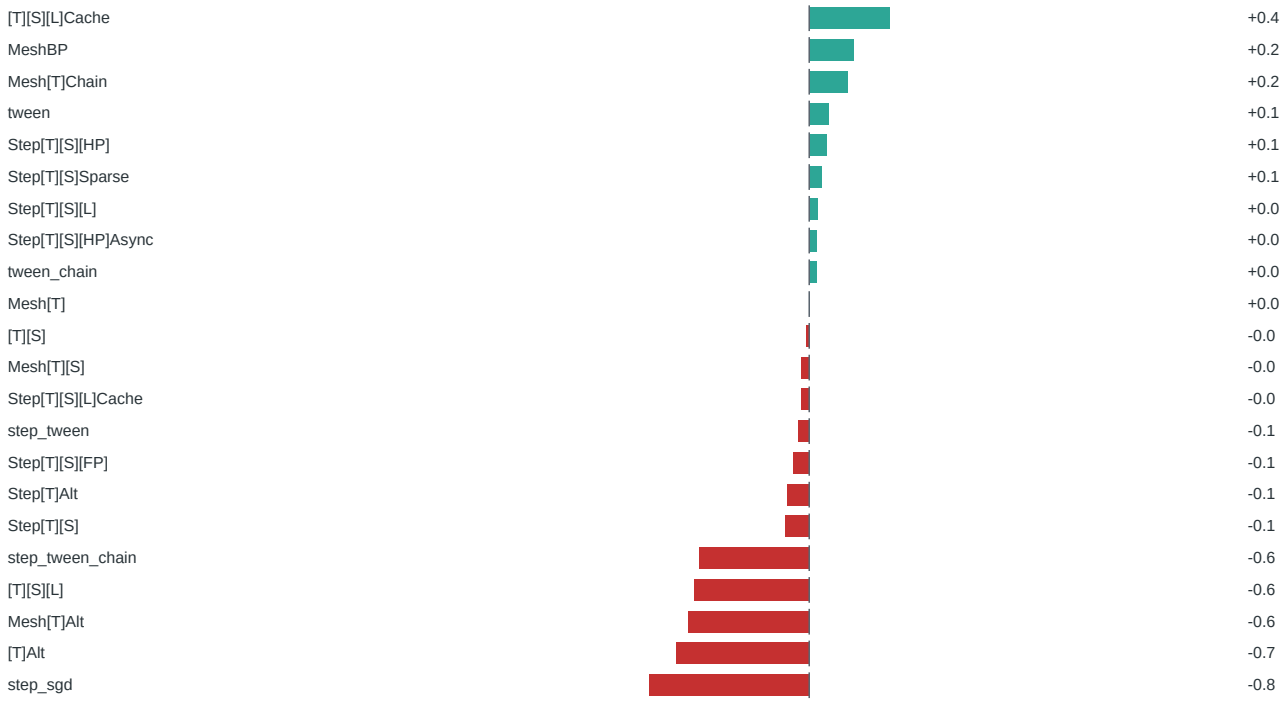

AdaptPct % -> n=986 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

vs sgd - matched dtype x format x arch

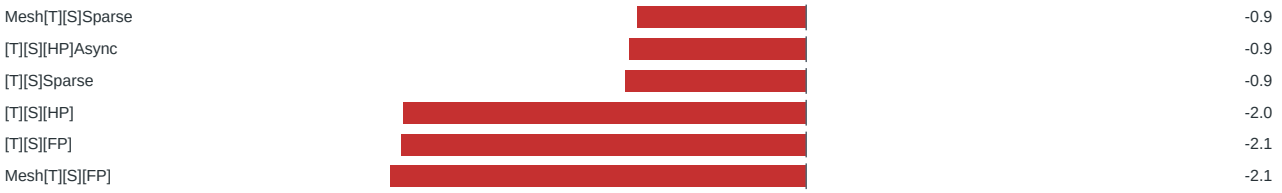
AccDelta is the honest column. ScoreDelta is usually Availability (duty clock), not a better chain rule. Acc win = AccDelta > 0.5. Score win = ScoreDelta > 1. Baseline is discovered from the board, not a frozen StepBP list.

mode	n	AccD	Acc win%	SoftD	AvailD	ThruD	ScoreD	Score win%
[T][S][L]Cache	34	+0.4	62	-1.0	+13.9	+308	+9.0	97
MeshBP	34	+0.2	21	+0.2	+0.1	-2	+0.1	12
Mesh[T]Chain	34	+0.2	26	+0.2	+0.2	-0	+0.2	12
tween	34	+0.1	41	-2.6	-2.9	-53	-0.9	9
Step[T][S][HP]	34	+0.1	35	-2.6	+0.0	-8	+0.1	24
Step[T][S]Sparse	34	+0.1	32	-2.6	+0.9	+6	+0.4	29
Step[T][S][L]	34	+0.0	35	-2.6	+7.1	+137	+3.6	71
Step[T][S][HP]Async	34	+0.0	35	-2.6	+0.8	+5	+0.4	29
tween_chain	34	+0.0	24	+0.0	+0.1	-1	+0.1	9
Mesh[T]	34	+0.0	29	-2.6	-2.7	-51	-0.9	9
[T][S]	34	-0.0	35	-0.7	+4.7	+86	+1.9	76
Mesh[T][S]	34	-0.0	38	-0.6	+4.9	+87	+1.9	71
Step[T][S][L]Cache	34	-0.0	32	-2.6	+6.9	+131	+3.3	74
step_tween	34	-0.1	35	-2.6	-0.2	-8	+0.0	21
Step[T][S][FP]	34	-0.1	32	-2.6	+0.8	+5	+0.3	29
Step[T]Alt	34	-0.1	35	-2.6	-6.3	-110	-1.9	3
Step[T][S]	34	-0.1	32	-2.6	+0.6	+5	+0.2	24
step_tween_chain	34	-0.6	15	-1.2	+3.5	+66	+0.9	47
[T][S][L]	34	-0.6	21	-1.1	+12.4	+266	+5.6	94
Mesh[T]Alt	34	-0.6	18	-0.1	-5.5	-91	-2.0	0
[T]Alt	34	-0.7	18	-0.2	-5.7	-92	-2.1	0
step_sgd	34	-0.8	15	-1.3	+3.3	+64	+0.7	32
Mesh[T][S]Sparse	34	-0.9	12	-1.4	+13.3	+289	+6.2	100
[T][S][HP]Async	34	-0.9	21	-1.6	+4.8	+87	+1.1	50
[T][S]Sparse	34	-0.9	6	-1.3	+13.1	+291	+6.0	97
[T][S][HP]	34	-2.0	3	-2.2	+4.9	+90	+0.1	21
[T][S][FP]	34	-2.1	6	-2.2	+4.8	+88	+0.1	15
Mesh[T][S][FP]	34	-2.1	3	-2.2	+5.0	+90	+0.1	18

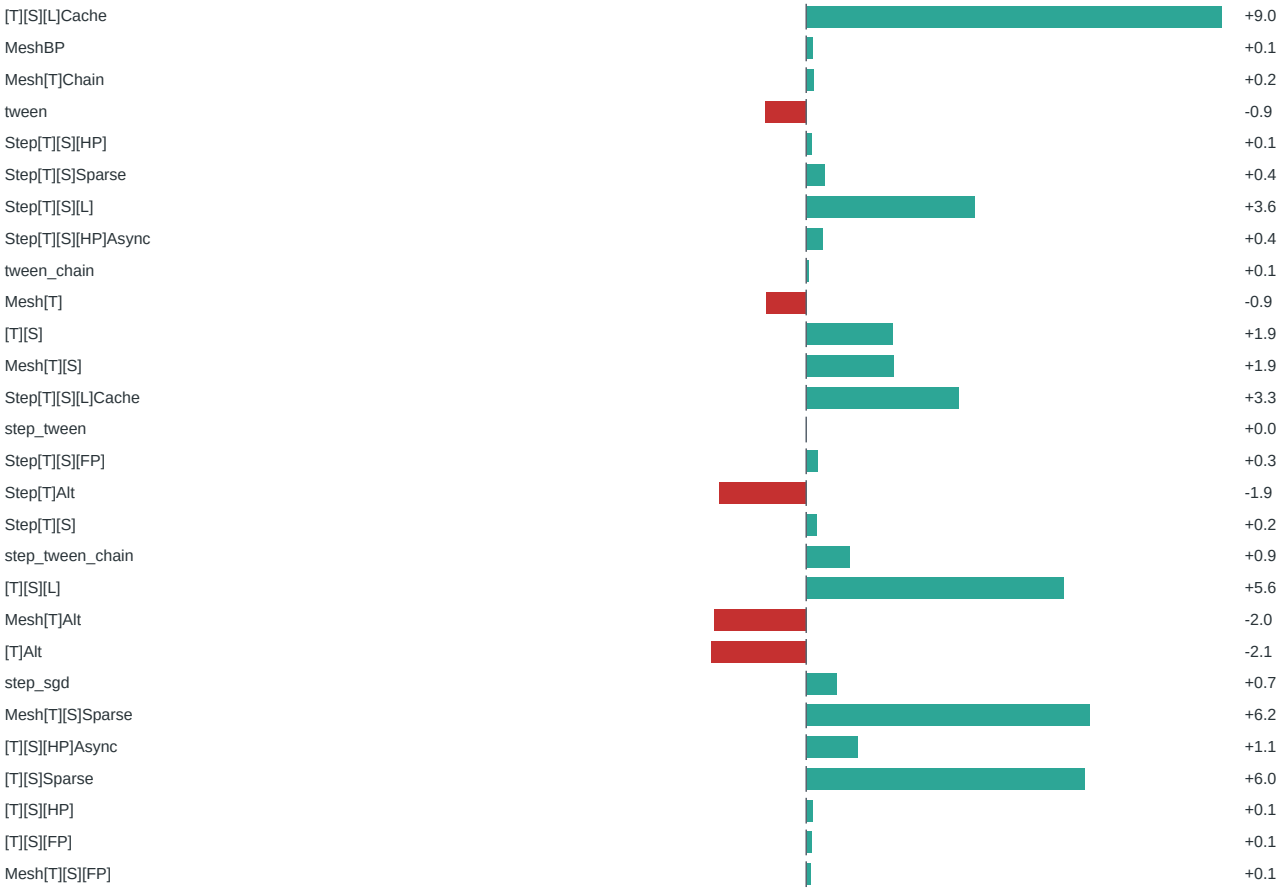
mean AccD vs sgd



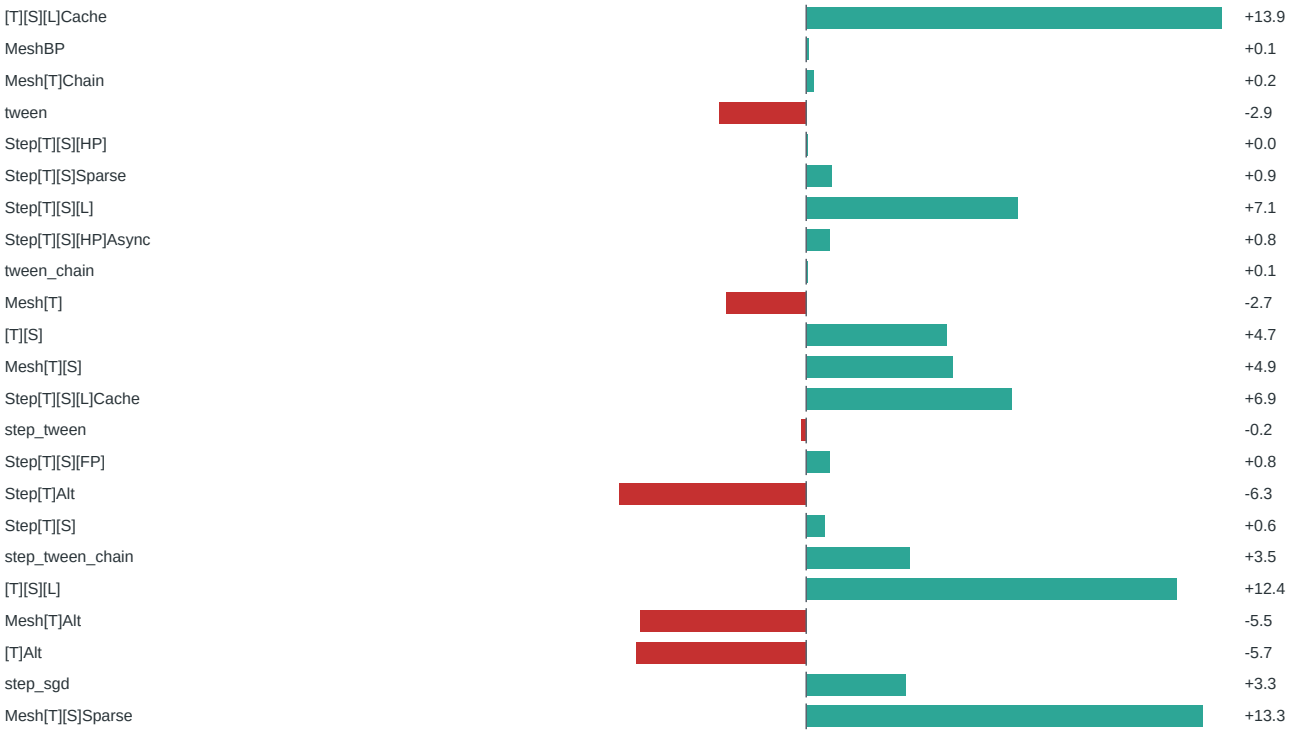
mean AccD vs sgd



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

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

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	-1	+2	+0	+0	+4	+0	-1	+0	-0	-0
Mesh[T]	-1	-1	-3	-1	+1	-2	-2	-1	-0	-0
Mesh[T]Alt	-1	+1	-1	-0	+3	-1	-1	-1	-1	-1
Mesh[T]Chain	-0	+2	-1	-0	+4	-1	-0	+0	-0	+1
Mesh[T][S]	+1	+3	-0	+0	+4	+0	+0	-0	+1	-1
Mesh[T][S][FP]	-3	-0	-3	-3	+1	-3	-3	-3	-3	-2
Mesh[T][S]Sparse	-2	+1	-2	-1	+3	-1	-1	-2	-1	-1
Step[T]Alt	-1	-1	-3	-1	+1	-3	-3	-1	-1	-1
Step[T][S]	-1	-1	-3	-2	+0	-3	-2	-2	-1	-0
Step[T][S][FP]	-0	-1	-4	-1	+1	-3	-3	-1	-2	-1
Step[T][S][HP]	-2	-0	-3	-1	+1	-3	-2	-0	-1	-1
Step[T][S][HP]Async	-1	-1	-4	-0	+1	-2	-3	-1	-1	-1
Step[T][S][L]	-1	+0	-3	-0	+1	-3	-2	-1	-1	-1
Step[T][S][L]Cache	-1	-0	-3	+0	+1	-3	-3	-1	-1	-0
Step[T][S]Sparse	-1	-0	-3	-1	+0	-3	-2	-1	-0	-1
[T]Alt	-1	+1	-1	-1	+3	-1	-1	-0	-1	-0
[T][S]	-0	+2	-0	+0	+4	+1	+1	+0	+0	+0
[T][S][FP]	-3	+1	-4	-3	+1	-3	-3	-2	-3	-2
[T][S][HP]	-3	-1	-4	-2	+2	-3	-3	-2	-3	-2
[T][S][HP]Async	-1	+2	-1	+1	+4	-0	-1	-0	-1	+1
[T][S][L]	-0	-1	+0	-0	+4	+1	-0	+0	+0	-0
[T][S][L]Cache	+1	+1	+1	+2	+5	+1	+1	+2	+2	+2
[T][S]Sparse	-1	+2	-1	-1	+2	-1	-2	-1	-0	-0
step_sgd	+0	+2	-2	-0	+4	-1	-1	-2	-1	-1
step_tween	-2	-1	-3	-1	+1	-2	-3	-0	-1	+0
step_tween_chain	-0	+2	-0	-0	+3	+0	-2	+0	-1	-0
tween	-2	-3	-2	+1	+1	-3	-3	-1	-2	-0
tween_chain	-0	+2	-2	+0	+4	-0	-0	-0	+1	-0

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

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	+0	-0	-0	+0	-1	-0	+0	+2	+1	+1	+0	-0
Mesh[T]	-1	-3	-2	-2	-3	-1	-1	+2	-3	-1	-4	-1
Mesh[T]Alt	-2	-4	-2	-3	-4	-1	-1	-0	-4	-2	-3	-2
Mesh[T]Chain	+0	+0	-0	+0	-0	-0	-0	+2	+2	+1	+0	+0
Mesh[T][S]	+4	-1	-0	+3	-1	+2	+2	+3	+5	+3	+3	+2
Mesh[T][S][FP]	+0	+2	+0	-0	-1	+0	+0	+1	+0	+1	+2	+0
Mesh[T][S]Sparse	+8	+16	+4	+6	+14	+4	+4	+3	+13	+7	+13	+7
Step[T]Alt	-2	-4	-2	-3	-5	-2	-1	+1	-4	-2	-4	-2
Step[T][S]	+0	-2	-1	-1	-2	-1	-1	+5	-0	-1	-1	+0
Step[T][S][FP]	-0	-2	-1	-0	-2	-1	-1	+4	-1	-1	-2	+0
Step[T][S][HP]	+1	-2	-1	-0	-3	-1	-1	+4	-0	-1	-3	+0
Step[T][S][HP]Async	+0	-2	-1	-0	-3	-1	-1	+5	-0	-1	-2	+0
Step[T][S][L]	+4	+2	-0	+2	+1	+0	-0	+10	+5	+1	+5	+2
Step[T][S][L]Cache	+3	+2	-0	+2	+2	+0	+0	+7	+5	+0	+2	+2
Step[T][S]Sparse	+0	-2	-1	-0	-3	-1	-0	+4	+1	-1	-2	-0
[T]Alt	-2	-4	-2	-3	-5	-1	-1	-0	-4	-1	-3	-2
[T][S]	+3	-0	+0	+3	+2	+1	+1	+4	+3	+3	+3	+3
[T][S][FP]	+0	+3	+0	-0	-1	+0	+0	+1	+3	+1	-0	-0
[T][S][HP]	+0	+2	+1	+0	-1	-0	-0	+1	+0	+1	+2	+0
[T][S][HP]Async	+3	+3	-1	+2	+1	+1	+1	+1	+4	+2	+0	+2
[T][S][L]	+9	+12	+4	+7	+12	+4	+3	+5	+13	+6	+1	+8
[T][S][L]Cache	+12	+21	+7	+13	+23	+6	+6	+3	+29	+9	+7	+12
[T][S]Sparse	+7	+15	+4	+7	+13	+3	+3	+3	+9	+6	+16	+6
step_sgd	+2	+1	+0	+1	+1	+1	+1	+1	+1	+0	+2	+2
step_tween	+0	-1	-1	-1	-3	-1	-1	+4	+0	-1	-3	+1
step_tween_chain	+3	+1	+1	+1	+2	+0	+0	+1	+2	+2	+2	+2
tween	-1	-3	-2	-2	-3	-1	-1	+2	-2	-1	-3	-1
tween_chain	+0	+0	-1	-0	-0	-0	+0	-0	-0	+0	+0	+0

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	-1	+1	-0	-0	+2	+0	-0	+0	+0	+0
Mesh[T]	-1	-1	-2	-2	+0	-1	-1	-1	-2	-1
Mesh[T]Alt	-3	-1	-2	-3	-0	-1	-1	-3	-5	-2
Mesh[T]Chain	+0	+1	-0	-0	+2	-0	+0	+1	-0	+0
Mesh[T][S]	+3	+4	+1	+3	+6	+1	+2	+3	+4	+2
Mesh[T][S][FP]	+0	+1	-0	-1	+2	-0	+0	+0	-1	+0
Mesh[T][S]Sparse	+5	+7	+3	+6	+10	+4	+4	+6	+10	+6
Step[T]Alt	-2	-2	-2	-2	-1	-2	-1	-2	-4	-2
Step[T][S]	-1	-1	-1	-1	+0	-1	-1	-0	-1	+0
Step[T][S][FP]	+0	-0	-1	-0	+0	-1	-1	-0	-2	+0
Step[T][S][HP]	-1	-0	-1	-1	+1	-1	-1	-0	-1	-1
Step[T][S][HP]Async	-0	-0	-1	-0	+1	-1	-1	-0	-1	-0
Step[T][S][L]	+3	+2	+0	+3	+3	-0	+0	+3	+5	+3
Step[T][S][L]Cache	+3	+2	-0	+4	+3	+0	-0	+3	+4	+3
Step[T][S]Sparse	-0	-0	-1	-0	+1	-1	-0	-0	+0	+0
[T]Alt	-3	-2	-2	-3	-0	-1	-1	-2	-5	-2
[T][S]	+3	+3	+1	+2	+5	+2	+2	+3	+4	+2
[T][S][FP]	-0	+2	-1	-0	+2	-0	+0	+0	-1	+1
[T][S][HP]	-0	+0	-1	-0	+3	-0	-0	+0	-1	-0
[T][S][HP]Async	+2	+3	+1	+3	+5	+1	+1	+2	+2	+3
[T][S][L]	+8	+3	+5	+7	+11	+5	+4	+9	+12	+7
[T][S][L]Cache	+13	+8	+8	+12	+15	+6	+5	+14	+21	+12
[T][S]Sparse	+8	+9	+4	+8	+8	+4	+3	+8	+12	+7
step_sgd	+2	+2	-0	+1	+4	+0	+1	+1	+1	+1
step_tween	-1	-1	-1	-1	+1	-1	-1	+0	-1	+0
step_tween_chain	+2	+3	+1	+1	+3	+1	+0	+2	+2	+1
tween	-2	-2	-2	-1	-0	-1	-1	-1	-3	-1
tween_chain	-0	+1	-1	+0	+2	+0	+0	+0	+0	-0

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

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

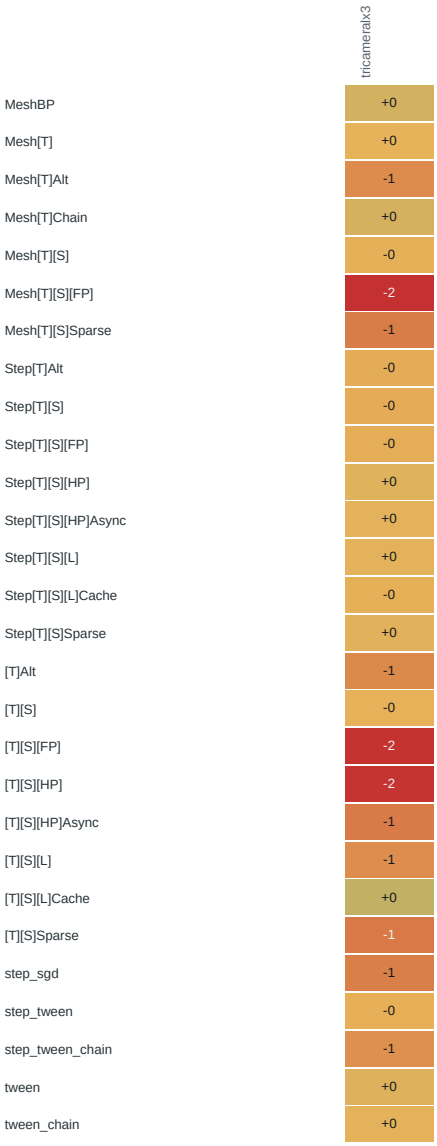
AvailD vs sgd, every mode x dtype (cols 25-34)

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

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

AccD vs sgd, every mode x arch

AccD vs sgd, every mode x arch



Family collapse - Step* vs non-Step

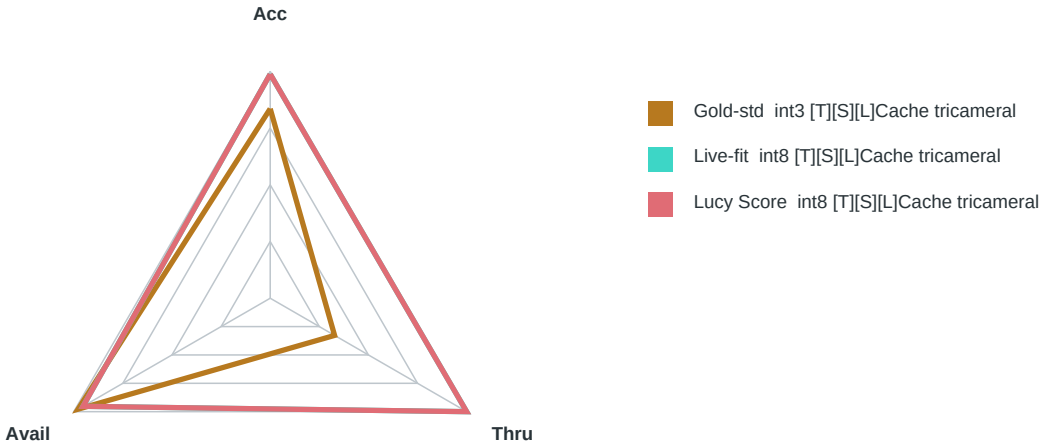
Step* is a 1D pipe (one sample enters layer 0 per tick; output is the sample that entered depth ticks ago). Non-Step of the same family is a full-chain update. AccD is a real scheduler split, not leftover warm-up forwards.

step	plain	n	mean |AccD|
Step[T]Alt	[T]Alt	34	2.67
Step[T][S]	[T][S]	34	3.00
Step[T][S][FP]	[T][S][FP]	34	2.51
Step[T][S][HP]	[T][S][HP]	34	2.57
Step[T][S][HP]Async	[T][S][HP]Async	34	2.89
Step[T][S][L]	[T][S][L]	34	3.01
Step[T][S][L]Cache	[T][S][L]Cache	34	3.89
Step[T][S]Sparse	[T][S]Sparse	34	2.78
step_sgd	sgd	34	1.30
step_tween	tween	34	0.61
step_tween_chain	tween_chain	34	0.97

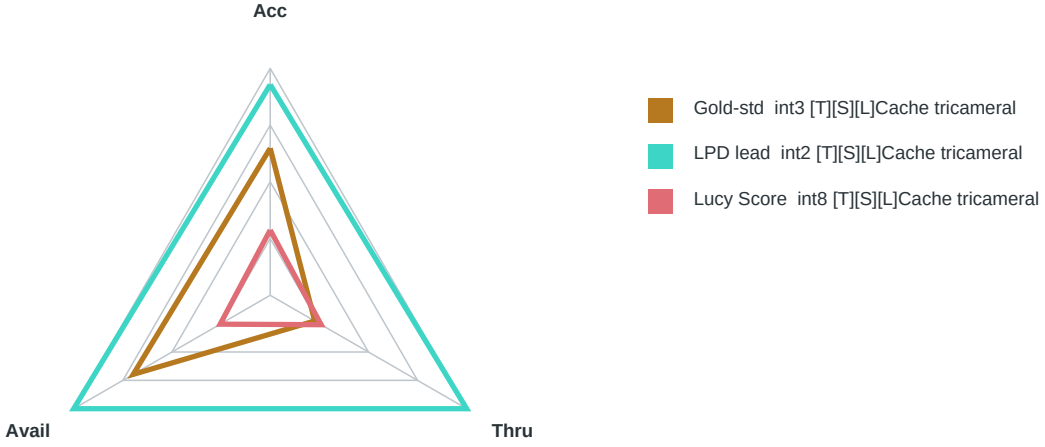
Consciousness - Acc, Throughput, Availability

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 int64|none|Step[T][S][L]|tricameral|simd Acc 10.2 Thru 398 Avail 28.1% 688.8 KiB (RAM reference)
Lucy Score champ (T x Avail x Acc) int8|none|[T][S][L]Cache|tricameral|simd Score 35.3 Acc 10.1 Soft 5 86.1 KiB
Live-fit champ (best Q) int8|none|[T][S][L]Cache|tricameral|simd Acc 10.1 Thru 1030 Avail 34.0% 86.1 KiB
Gold-std (2+ pillars, Acc keep >= 80%, then smallest then fastest): int3|none|[T][S][L]Cache|tricameral|simd mode [T][S][L]Cache Acc 8.5 Thru 338 32.3 KiB
Board fastest float32|none|[T][S][L]|tricameral|simd Thru 1104 (traps may own this) Best availability int|none|[T][S][L]Cache|tricameral|simd 35.8%
Learner Thru peak 1030 learner Avail peak 35.7%

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	int4 [T][S][L]Cache tricameral	82	100	96	92	6	16.0	14.77	8.4	1029	43.0
gold	int8 [T][S][L]Cache tricameral	99	100	95	98	12	8.0	7.84	10.1	1030	86.1

gold	uint8 [T][S][L]Cache tricameral	83	91	97	90	13	8.0	7.23	8.5	936	86.1

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

Mode	n	Acc	KiB	Thru	Cell
[T][S][L]Cache	13	10.1	32.3	1030	int3 [T][S][L]Cache tricameral / int8 [T][S][L]Cache tricameral
Step[T][S][L]	1	8.5	688.8	339	int Step[T][S][L] tricameral

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

Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
near	uint3 [T][S][L]Cache tricameral	80	35	99	65	5	21.3	13.86	8.2	356	32.3
near	int3 [T][S][L]Cache tricameral	84	33	98	64	5	21.3	13.75	8.5	338	32.3
near	uint4 [T][S][L]Cache tricameral	80	57	99	77	6	16.0	12.31	8.2	590	43.1
near	nf4 [T][S][L]Cache tricameral	81	42	95	68	6	16.0	10.96	8.2	431	43.0
near	int6 [T][S][L]Cache tricameral	83	25	99	59	9	10.7	6.30	8.5	259	64.6
near	uint16 [T][S][L]Cache tricameral	81	57	98	77	25	4.0	3.07	8.3	586	172.2
near	int32 [T][S][L]Cache tricameral	87	54	99	77	50	2.0	1.54	8.9	551	344.4

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
-	int2 [T][S][L]Cache tricameral	80	96	94	90	3	32.0	28.67	8.1	993	21.5
-	int2 Mesh[T][S]Sparse tricameral	72	90	91	84	3	32.0	26.79	7.3	928	21.5
acc	binary [T][S] tricameral	86	54	66	67	2	32.0	21.57	8.8	560	10.8
-	int2 [T][S][HP]Async tricameral	73	52	62	62	3	32.0	19.73	7.4	540	21.5
-	uint2 Mesh[T][S] tricameral	71	35	73	56	3	31.9	17.99	7.2	360	21.6
-	int2 tween_chain tricameral	72	43	52	55	3	32.0	17.48	7.4	445	21.5
-	int2 Mesh[T]Chain tricameral	72	42	51	54	3	32.0	17.27	7.4	438	21.5
gold	int4 [T][S][L]Cache tricameral	82	100	96	92	6	16.0	14.77	8.4	1029	43.0
near	uint3 [T][S][L]Cache tricameral	80	35	99	65	5	21.3	13.86	8.2	356	32.3
near	int3 [T][S][L]Cache tricameral	84	33	98	64	5	21.3	13.75	8.5	338	32.3
-	uint3 [T][S][L] tricameral	72	31	92	59	5	21.3	12.53	7.3	318	32.3
near	uint4 [T][S][L]Cache tricameral	80	57	99	77	6	16.0	12.31	8.2	590	43.1
near	nf4 [T][S][L]Cache tricameral	81	42	95	68	6	16.0	10.96	8.2	431	43.0
-	uint4 Mesh[T][S] tricameral	72	37	73	58	6	16.0	9.25	7.3	380	43.1
-	uint4 [T][S] tricameral	70	37	73	57	6	16.0	9.19	7.2	380	43.1
-	uint3 MeshBP tricameral	72	17	59	42	5	21.3	8.86	7.3	174	32.3
-	int4 tween_chain tricameral	71	45	53	55	6	16.0	8.82	7.2	459	43.0
-	nf4 Mesh[T][S] tricameral	77	28	73	54	6	16.0	8.66	7.9	289	43.0
-	nf4 [T][S] tricameral	73	28	72	52	6	16.0	8.40	7.5	284	43.0
gold	int8 [T][S][L]Cache tricameral	99	100	95	98	12	8.0	7.84	10.1	1030	86.1

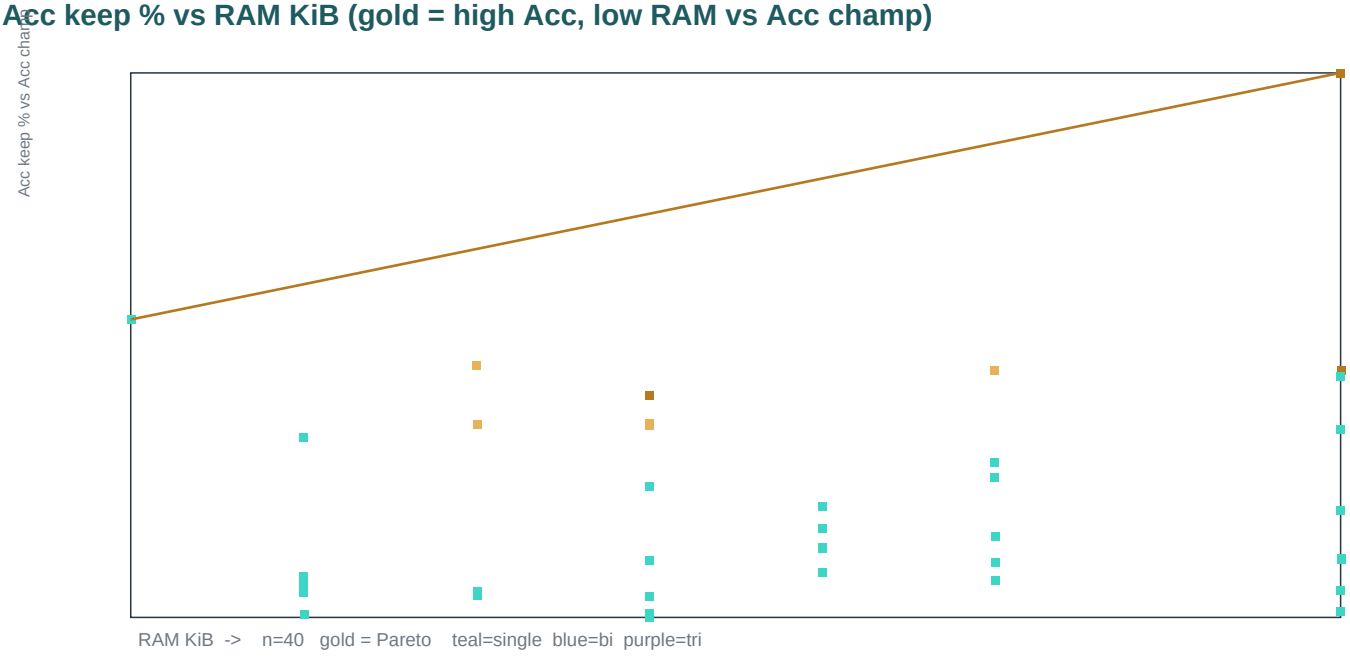
Consciousness rank - Q = geomean Acc/Thru/Avail keep

Band	Cell	Acc%	Thru%	Avail%	Q%	LPD	Thru	Avail
gold	int8 [T][S][L]Cache tricameral	99	100	95	98	7.84	1030	34.0
gold	int4 [T][S][L]Cache tricameral	82	100	96	92	14.77	1029	34.3
gold	uint8 [T][S][L]Cache tricameral	83	91	97	90	7.23	936	34.8
-	int2 [T][S][L]Cache tricameral	80	96	94	90	28.67	993	33.4
-	int2 Mesh[T][S]Sparse tricameral	72	90	91	84	26.79	928	32.4
acc	float32 Step[T][S][L] tricameral	83	77	80	80	1.60	793	28.5
acc	float32 Step[T][S][L]Cache tricameral	89	74	78	80	1.60	761	27.7
keep	uint64 [T][S][L]Cache tricameral	84	58	99	78	0.78	598	35.3
near	int32 [T][S][L]Cache tricameral	87	54	99	77	1.54	551	35.2
near	uint4 [T][S][L]Cache tricameral	80	57	99	77	12.31	590	35.4

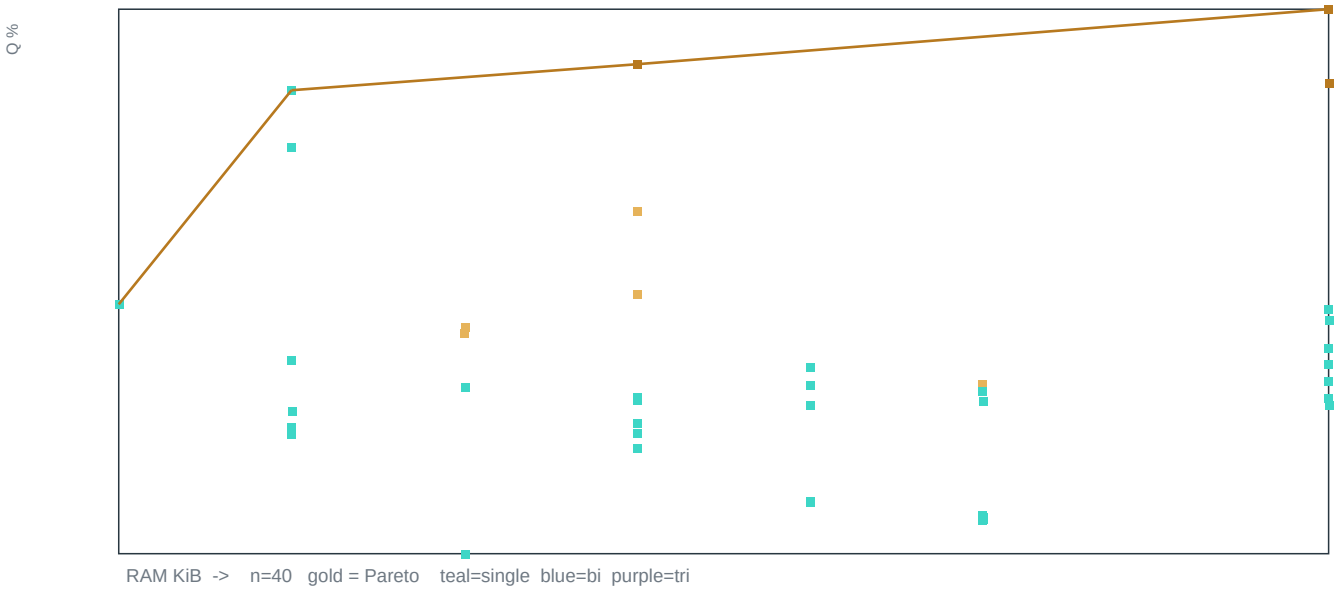
Trap - tiny RAM, Acc keep < 70% (Score/MiB and SoftAcc Score lie here)

Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
trap	binary sgd tricameral	62	44	53	52	2	32.0	0.00	6.3	450	10.8
trap	binary step_sgd tricameral	63	52	60	58	2	32.0	0.00	6.4	532	10.8
trap	binary tween tricameral	45	33	44	41	2	32.0	0.00	4.6	345	10.8
trap	binary tween_chain tricameral	59	39	48	48	2	32.0	0.00	6.0	403	10.8
trap	binary step_tween tricameral	34	37	48	39	2	32.0	0.00	3.5	380	10.8
trap	binary step_tween_chain tricameral	63	51	60	57	2	32.0	0.00	6.4	521	10.8
trap	binary MeshBP tricameral	63	41	51	51	2	32.0	0.00	6.4	425	10.8
trap	binary Mesh[T] tricameral	46	32	43	40	2	32.0	0.00	4.7	333	10.8
trap	binary Mesh[T]Chain tricameral	65	42	52	52	2	32.0	0.00	6.6	434	10.8
trap	binary Step[T][S] tricameral	28	42	54	40	2	32.0	0.00	2.8	438	10.8

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

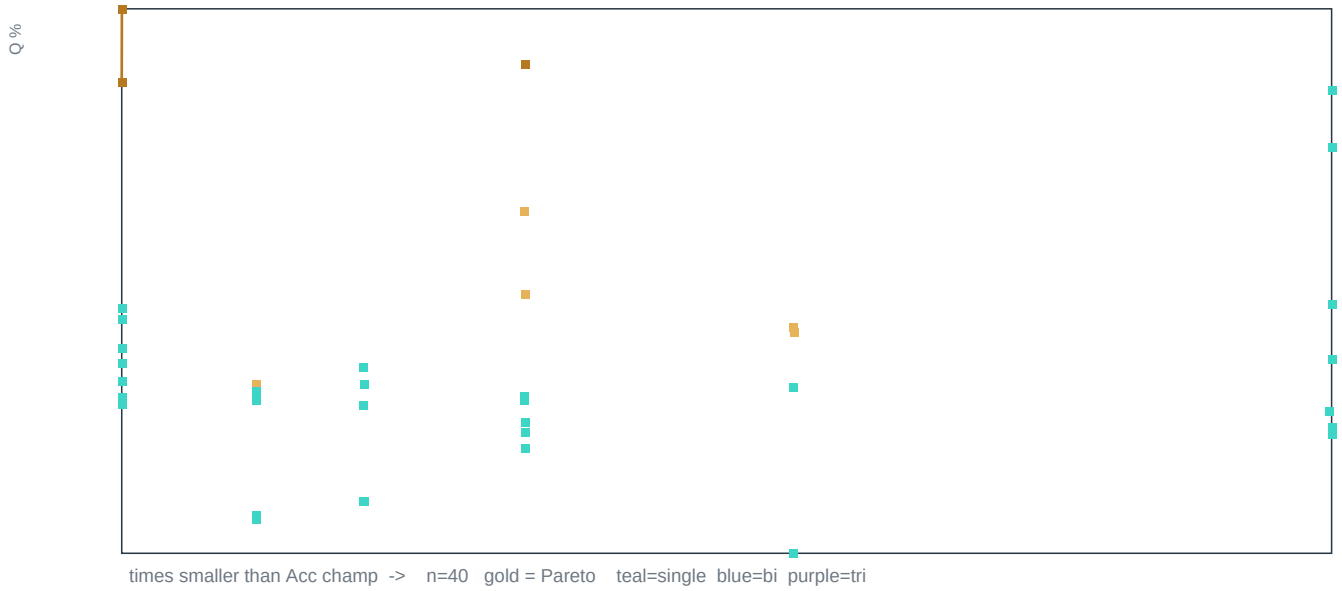


Q% vs RAM KiB (gold = high consciousness, low RAM)

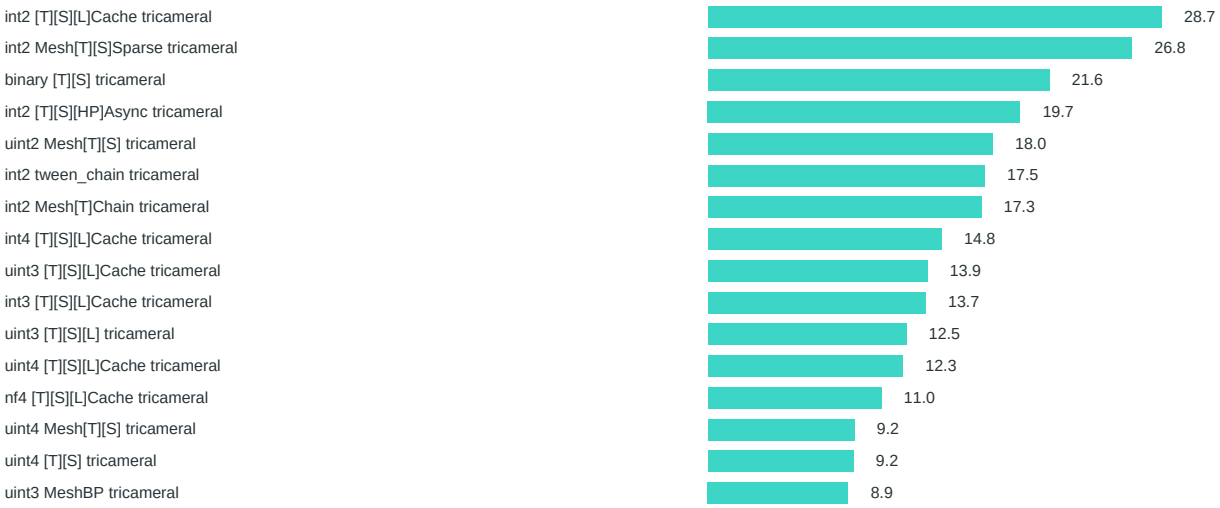


Q% vs shrink vs Acc champ (gold = upper right)

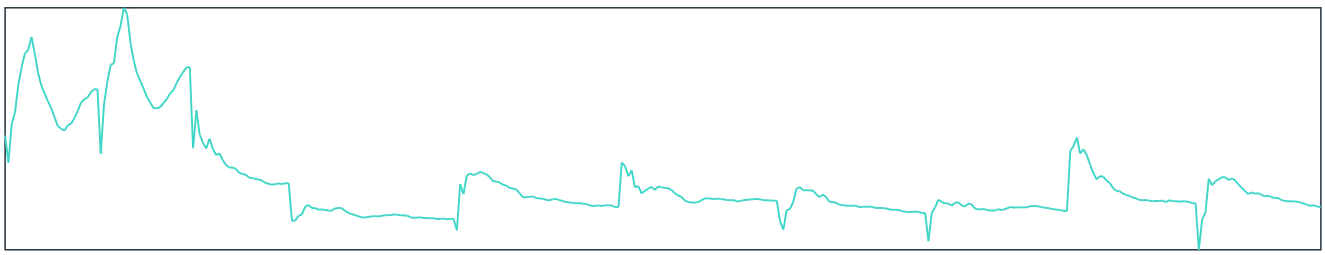
Q% vs shrink vs Acc champ (gold = upper right)



Top Lucy density (LPD)

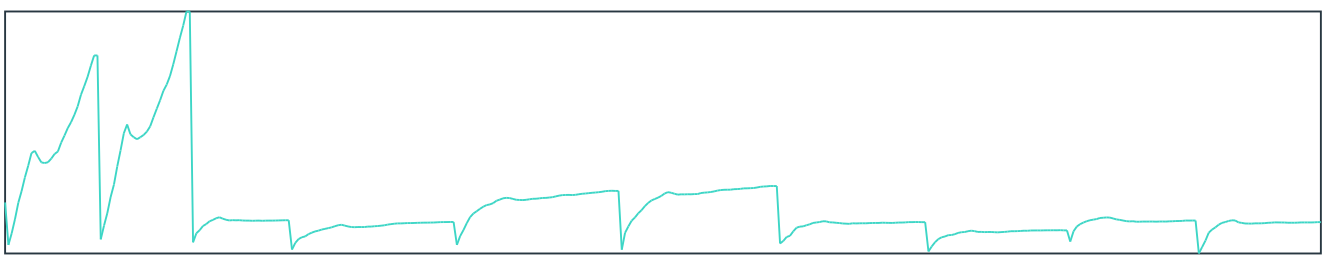


Live pulse (Score)



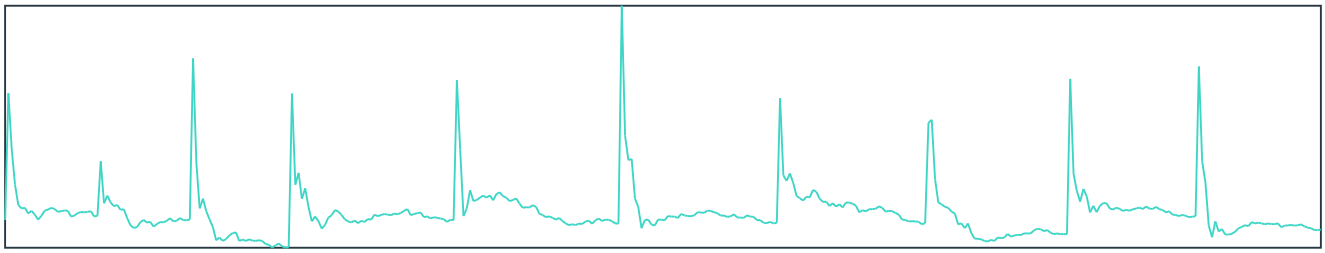
n=400 min=0.28 max=6.91

Live pulse (SoftAcc)



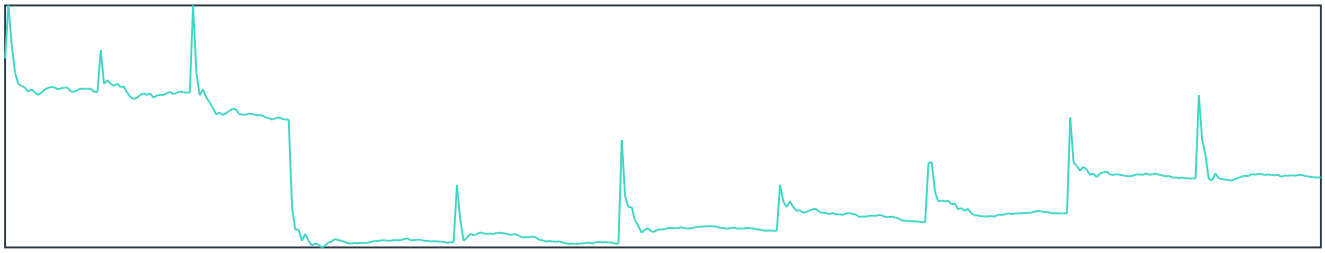
n=400 min=1.54 max=1.58

Live pulse (Availability)



n=400 min=21.25 max=29.69

Live pulse (Throughput)



n=400 min=131.19 max=303.84

Queue by train mode (this epoch)

Mode	Done	Run	Left	Total
sgd	34	0	0	34
step_sgd	34	0	0	34
tween	34	0	0	34
tween_chain	34	0	0	34
step_tween	34	0	0	34
step_tween_chain	34	0	0	34
MeshBP	34	0	0	34
Mesh[T]	34	0	0	34
Mesh[T]Chain	34	0	0	34
[T][S]	34	0	0	34
Step[T][S]	34	0	0	34
[T]Alt	34	0	0	34
Step[T]Alt	34	0	0	34
[T][S][HP]	34	0	0	34
[T][S][L]	34	0	0	34
[T][S][FP]	34	0	0	34
[T][S][L]Cache	34	0	0	34
[T][S][HP]Async	34	0	0	34
[T][S]Sparse	34	0	0	34
Mesh[T][S]	34	0	0	34
Mesh[T]Alt	34	0	0	34
Mesh[T][S][FP]	34	0	0	34
Mesh[T][S]Sparse	34	0	0	34
Step[T][S][HP]	34	0	0	34
Step[T][S][L]	34	0	0	34
Step[T][S][FP]	34	0	0	34
Step[T][S][L]Cache	34	0	0	34
Step[T][S][HP]Async	34	0	0	34

Step[T][S]Sparse	34	0	0	34