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 0.02 - 2026-08-21 09:15:18 - 0.0.0.0:8155
This epoch 986 / 986 cells. Recorded 986 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.
live_gpt v1.0.0 - cameralx8 - tinyshakespeare - 4096 windows - seq 32 - causal MHA - A->B->A2 - SIMD

Lucy champions (this tide)

Axis	Cell	Score	Soft	Acc	Thru	Avail
hard acc	bfloat16|none|Mesh[T]Chain|cameralx8|simd	3.74	3.8	13.5	115.4	24.0
throughput	float32|none|[T][S][L]Cache|cameralx8|simd	1.87	1.5	1.8	272.1	38.0
availability	float64|none|[T][S][L]Cache|cameralx8|simd	1.80	1.5	2.1	229.5	38.2
lucy score	float32|none|step_tween_chain|cameralx8|simd	6.12	3.7	11.5	185.0	28.9
mobile score (trap)	binary|none|[T][S]Sparse|cameralx8|simd	1.68	1.5	1.8	254.2	37.1
acc/sec	float32|none|step_tween_chain|cameralx8|simd	6.12	3.7	11.5	185.0	28.9

Lucy axis champions (this tide)

Axis	Mode	DType	Arch	Value
hard_acc	MeshBP	bfloat16	cameralx8	13.61
throughput	[T][S][L]Cache	float32	cameralx8	272.15
availability	[T][S][L]Cache	float64	cameralx8	38.21
score	step_tween_chain	float32	cameralx8	6.12
soft_acc	Mesh[T]Chain	bfloat16	cameralx8	3.83
acc_thru	step_tween_chain	float32	cameralx8	21.20
realtime	[T][S][L]Cache	float32	cameralx8	103.54
adapt	step_tween_chain	float32	cameralx8	3.09
keep_learn	sgd	fp4	cameralx8	10.15
acc_per_sec	step_tween_chain	float32	cameralx8	0.26
stability	sgd	fp4	cameralx8	100.00
mobile_score	[T][S]Sparse	binary	cameralx8	129.46
lpd	step_tween_chain	bfloat16	cameralx8	0.89
mspeed	step_sgd	float32	cameralx8	1.00
mavail	step_tween_chain	float32	cameralx8	1.00
mix	step_tween_chain	float32	cameralx8	0.94
gold_std	step_sgd	bfloat16	cameralx8	212.19

Best settings per train mode

Mode	DType	Format	Score	Soft	Acc	Avail	n
step_tween_chain	float32	none	6.1	3.7	11.5	28.9	34
[T][S][L]	bfloat16	none	5.8	1.5	7.7	36.4	34
step_sgd	float32	none	5.2	3.1	9.7	28.8	34
[T][S][L]Cache	bfloat16	none	4.6	1.5	5.5	37.9	34
sgd	float32	none	3.9	3.3	10.7	24.5	34
MeshBP	bfloat16	none	3.8	3.8	13.6	24.1	34
Mesh[T]Chain	bfloat16	none	3.7	3.8	13.5	24.0	34
tween_chain	float32	none	3.5	3.3	9.7	24.5	34
Mesh[T][S][FP]	bfloat16	none	3.3	1.5	8.0	28.7	34
[T][S][FP]	bfloat16	none	2.9	1.5	7.1	28.6	34
[T][S][HP]	bfloat16	none	2.8	1.5	6.7	28.8	34
[T][S][HP]Async	bfloat16	none	2.6	1.5	6.3	28.7	34

[T][S]	bfloat16	none	2.5	1.5	5.9	28.8	34
[T][S]Sparse	fp4	none	2.2	1.5	2.8	37.2	34
Mesh[T][S]Sparse	fp4	none	2.2	1.5	2.8	37.3	34
Mesh[T][S]	bfloat16	none	2.1	1.5	5.1	28.7	34
Step[T][S][L]	fp4	none	1.3	1.5	2.7	30.4	34
Step[T][S][L]Cache	float16	none	1.3	1.5	2.3	30.7	34
[T]Alt	bfloat16	none	1.0	1.6	9.4	15.7	34
Step[T][S][HP]Async	float32	none	0.9	1.5	2.5	24.7	34
Mesh[T]Alt	bfloat16	none	0.9	1.6	8.3	15.8	34
Step[T][S][FP]	fp4	none	0.8	1.5	2.7	24.2	34
Step[T][S]	fp4	none	0.7	1.5	2.6	24.4	34
Step[T][S]Sparse	fp4	none	0.7	1.5	2.6	24.4	34
step_tween	fp4	none	0.7	1.5	2.7	23.7	34
Step[T][S][HP]	fp4	none	0.7	1.5	2.5	24.0	34
Mesh[T]	fp4	none	0.6	1.5	2.8	20.8	34
tween	fp4	none	0.6	1.5	2.7	20.8	34
Step[T]Alt	float32	none	0.4	1.5	2.0	18.3	34

Best dtype per mode

Mode	Winner dtype	Score	Soft	Acc
step_tween_chain	float32	6.1	3.7	11.5
[T][S][L]	bfloat16	5.8	1.5	7.7
step_sgd	float32	5.2	3.1	9.7
[T][S][L]Cache	bfloat16	4.6	1.5	5.5
sgd	float32	3.9	3.3	10.7
MeshBP	bfloat16	3.8	3.8	13.6
Mesh[T]Chain	bfloat16	3.7	3.8	13.5
tween_chain	float32	3.5	3.3	9.7
Mesh[T][S][FP]	bfloat16	3.3	1.5	8.0
[T][S][FP]	bfloat16	2.9	1.5	7.1
[T][S][HP]	bfloat16	2.8	1.5	6.7
[T][S][HP]Async	bfloat16	2.6	1.5	6.3
[T][S]	bfloat16	2.5	1.5	5.9
[T][S]Sparse	fp4	2.2	1.5	2.8
Mesh[T][S]Sparse	fp4	2.2	1.5	2.8
Mesh[T][S]	bfloat16	2.1	1.5	5.1
Step[T][S][L]	fp4	1.3	1.5	2.7
Step[T][S][L]Cache	float16	1.3	1.5	2.3
[T]Alt	bfloat16	1.0	1.6	9.4
Step[T][S][HP]Async	float32	0.9	1.5	2.5
Mesh[T]Alt	bfloat16	0.9	1.6	8.3
Step[T][S][FP]	fp4	0.8	1.5	2.7
Step[T][S]	fp4	0.7	1.5	2.6
Step[T][S]Sparse	fp4	0.7	1.5	2.6
step_tween	fp4	0.7	1.5	2.7
Step[T][S][HP]	fp4	0.7	1.5	2.5
Mesh[T]	fp4	0.6	1.5	2.8
tween	fp4	0.6	1.5	2.7
Step[T]Alt	float32	0.4	1.5	2.0

Best mode per dtype

DType	Winner mode	Score	Soft	Acc

float32	step_tween_chain	6.1	3.7	11.5
bfloat16	[T][S][L]	5.8	1.5	7.7
float64	step_sgd	4.8	3.3	10.6
float16	step_sgd	4.2	3.2	10.3
int64	step_sgd	3.4	3.3	9.8
int32	step_tween_chain	3.4	2.3	9.8
int	step_tween_chain	3.3	3.4	11.1
uint64	step_sgd	3.3	2.6	9.7
complex64	step_tween_chain	3.2	3.2	10.5
uint32	step_tween_chain	3.2	2.3	9.5
uint16	step_sgd	3.2	2.5	9.4
complex128	step_sgd	3.2	3.3	10.4
uintptr	step_tween_chain	3.1	2.6	10.7
int16	step_sgd	3.1	2.4	8.9
uint	step_sgd	2.5	2.3	8.6
fp4	[T][S][L]	2.2	1.5	3.0
ternary	[T][S]Sparse	1.9	1.5	2.0
int2	Mesh[T][S]Sparse	1.8	1.5	1.9
int8	step_tween_chain	1.8	1.5	3.7
uint8	[T][S]Sparse	1.7	1.5	1.8
binary	[T][S]Sparse	1.7	1.5	1.8
int4	[T][S]Sparse	1.7	1.5	1.8
fp8e5m2	[T][S]Sparse	1.5	1.5	2.2
uint2	[T][S]Sparse	1.4	1.5	2.1
fp8e4m3	[T][S][L]Cache	1.2	1.5	1.9
uint4	[T][S][L]Cache	1.1	1.5	1.7
nf4	[T][S]Sparse	1.1	1.5	1.9
int6	Mesh[T][S]Sparse	0.9	1.5	2.4
int3	[T][S]Sparse	0.8	1.5	1.9
int5	[T][S][L]Cache	0.7	1.5	1.9
uint3	Mesh[T][S]Sparse	0.7	1.5	1.5
uint6	[T][S][L]Cache	0.7	1.5	1.9
uint5	Mesh[T][S]Sparse	0.6	1.5	1.5
fp6	[T][S]Sparse	0.5	1.5	1.4

Leaderboard (Lucy Score)

#	Cell	Score	Soft	Acc	Thru	Avail
1	float32|none|step_tween_chain|cameralx8|simd	6.1	3.7	11.5	185.0	28.9
2	bfloat16|none|[T][S][L]|cameralx8|simd	5.8	1.5	7.7	207.8	36.4
3	float32|none|step_sgd|cameralx8|simd	5.2	3.1	9.7	186.3	28.8
4	bfloat16|none|step_tween_chain|cameralx8|simd	5.1	3.6	12.8	143.7	27.9
5	bfloat16|none|step_sgd|cameralx8|simd	5.0	3.5	12.5	143.9	27.8
6	float64|none|step_sgd|cameralx8|simd	4.8	3.3	10.6	156.4	28.8
7	bfloat16|none|[T][S][L]Cache|cameralx8|simd	4.6	1.5	5.5	218.2	37.9
8	float16|none|step_sgd|cameralx8|simd	4.2	3.2	10.3	153.1	26.7
9	float64|none|step_tween_chain|cameralx8|simd	4.1	2.9	9.2	155.1	28.8
10	float16|none|step_tween_chain|cameralx8|simd	4.1	3.3	10.0	152.5	26.8
11	float32|none|sgd|cameralx8|simd	3.9	3.3	10.7	150.5	24.5
12	bfloat16|none|MeshBP|cameralx8|simd	3.8	3.8	13.6	116.1	24.1
13	float32|none|MeshBP|cameralx8|simd	3.8	3.5	10.4	148.4	24.6
14	bfloat16|none|Mesh[T]Chain|cameralx8|simd	3.7	3.8	13.5	115.4	24.0
15	bfloat16|none|sgd|cameralx8|simd	3.7	3.7	13.3	117.0	23.8
16	float64|none|MeshBP|cameralx8|simd	3.7	3.6	11.9	124.4	24.7

#	Cell	Score	Soft	Acc	Thru	Avail
17	float32|none|Mesh[T]Chain|cameralx8|simd	3.6	3.2	9.9	147.9	24.6
18	float32|none|tween_chain|cameralx8|simd	3.5	3.3	9.7	148.5	24.5
19	bfloat16|none|tween_chain|cameralx8|simd	3.5	3.8	12.6	116.4	23.8
20	float64|none|sgd|cameralx8|simd	3.4	3.3	11.1	125.8	24.5

Leaderboard (SoftAcc)

#	Cell	Score	Soft	Acc	Thru	Avail
1	bfloat16|none|Mesh[T]Chain|cameralx8|simd	3.7	3.8	13.5	115.4	24.0
2	bfloat16|none|MeshBP|cameralx8|simd	3.8	3.8	13.6	116.1	24.1
3	bfloat16|none|tween_chain|cameralx8|simd	3.5	3.8	12.6	116.4	23.8
4	bfloat16|none|sgd|cameralx8|simd	3.7	3.7	13.3	117.0	23.8
5	float32|none|step_tween_chain|cameralx8|simd	6.1	3.7	11.5	185.0	28.9
6	float64|none|MeshBP|cameralx8|simd	3.7	3.6	11.9	124.4	24.7
7	bfloat16|none|step_tween_chain|cameralx8|simd	5.1	3.6	12.8	143.7	27.9
8	bfloat16|none|step_sgd|cameralx8|simd	5.0	3.5	12.5	143.9	27.8
9	float32|none|MeshBP|cameralx8|simd	3.8	3.5	10.4	148.4	24.6
10	int64|none|Mesh[T]Chain|cameralx8|simd	2.9	3.5	12.4	97.5	24.3
11	int|none|step_tween_chain|cameralx8|simd	3.3	3.4	11.1	106.7	28.1
12	complex128|none|step_tween_chain|cameralx8|simd	3.2	3.4	10.5	107.4	28.1
13	int64|none|step_tween_chain|cameralx8|simd	3.3	3.4	9.6	121.5	28.3
14	float64|none|sgd|cameralx8|simd	3.4	3.3	11.1	125.8	24.5
15	float64|none|step_sgd|cameralx8|simd	4.8	3.3	10.6	156.4	28.8
16	float32|none|tween_chain|cameralx8|simd	3.5	3.3	9.7	148.5	24.5
17	complex128|none|step_sgd|cameralx8|simd	3.2	3.3	10.4	108.0	28.1
18	int64|none|step_sgd|cameralx8|simd	3.4	3.3	9.8	122.2	28.2
19	float16|none|step_tween_chain|cameralx8|simd	4.1	3.3	10.0	152.5	26.8
20	float32|none|sgd|cameralx8|simd	3.9	3.3	10.7	150.5	24.5

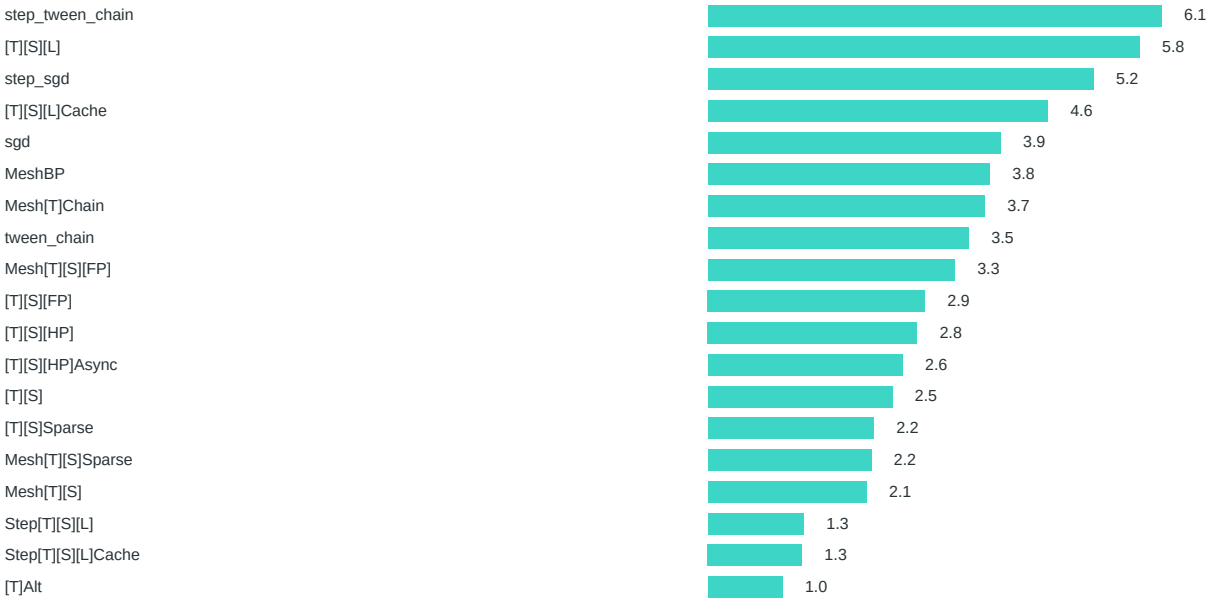
Leaderboard (hard Acc)

#	Cell	Score	Soft	Acc	Thru	Avail
1	bfloat16|none|MeshBP|cameralx8|simd	3.8	3.8	13.6	116.1	24.1
2	bfloat16|none|Mesh[T]Chain|cameralx8|simd	3.7	3.8	13.5	115.4	24.0
3	bfloat16|none|sgd|cameralx8|simd	3.7	3.7	13.3	117.0	23.8
4	bfloat16|none|step_tween_chain|cameralx8|simd	5.1	3.6	12.8	143.7	27.9
5	bfloat16|none|tween_chain|cameralx8|simd	3.5	3.8	12.6	116.4	23.8
6	bfloat16|none|step_sgd|cameralx8|simd	5.0	3.5	12.5	143.9	27.8
7	int64|none|Mesh[T]Chain|cameralx8|simd	2.9	3.5	12.4	97.5	24.3
8	float64|none|MeshBP|cameralx8|simd	3.7	3.6	11.9	124.4	24.7
9	float32|none|step_tween_chain|cameralx8|simd	6.1	3.7	11.5	185.0	28.9
10	int|none|step_tween_chain|cameralx8|simd	3.3	3.4	11.1	106.7	28.1
11	float64|none|sgd|cameralx8|simd	3.4	3.3	11.1	125.8	24.5
12	uintptr|none|step_tween_chain|cameralx8|simd	3.1	2.6	10.7	104.8	27.8
13	float32|none|sgd|cameralx8|simd	3.9	3.3	10.7	150.5	24.5
14	float64|none|step_sgd|cameralx8|simd	4.8	3.3	10.6	156.4	28.8
15	complex64|none|step_tween_chain|cameralx8|simd	3.2	3.2	10.5	107.9	28.3
16	complex128|none|step_tween_chain|cameralx8|simd	3.2	3.4	10.5	107.4	28.1
17	complex128|none|step_sgd|cameralx8|simd	3.2	3.3	10.4	108.0	28.1
18	float32|none|MeshBP|cameralx8|simd	3.8	3.5	10.4	148.4	24.6
19	float16|none|step_sgd|cameralx8|simd	4.2	3.2	10.3	153.1	26.7
20	float16|none|step_tween_chain|cameralx8|simd	4.1	3.3	10.0	152.5	26.8

Top scores



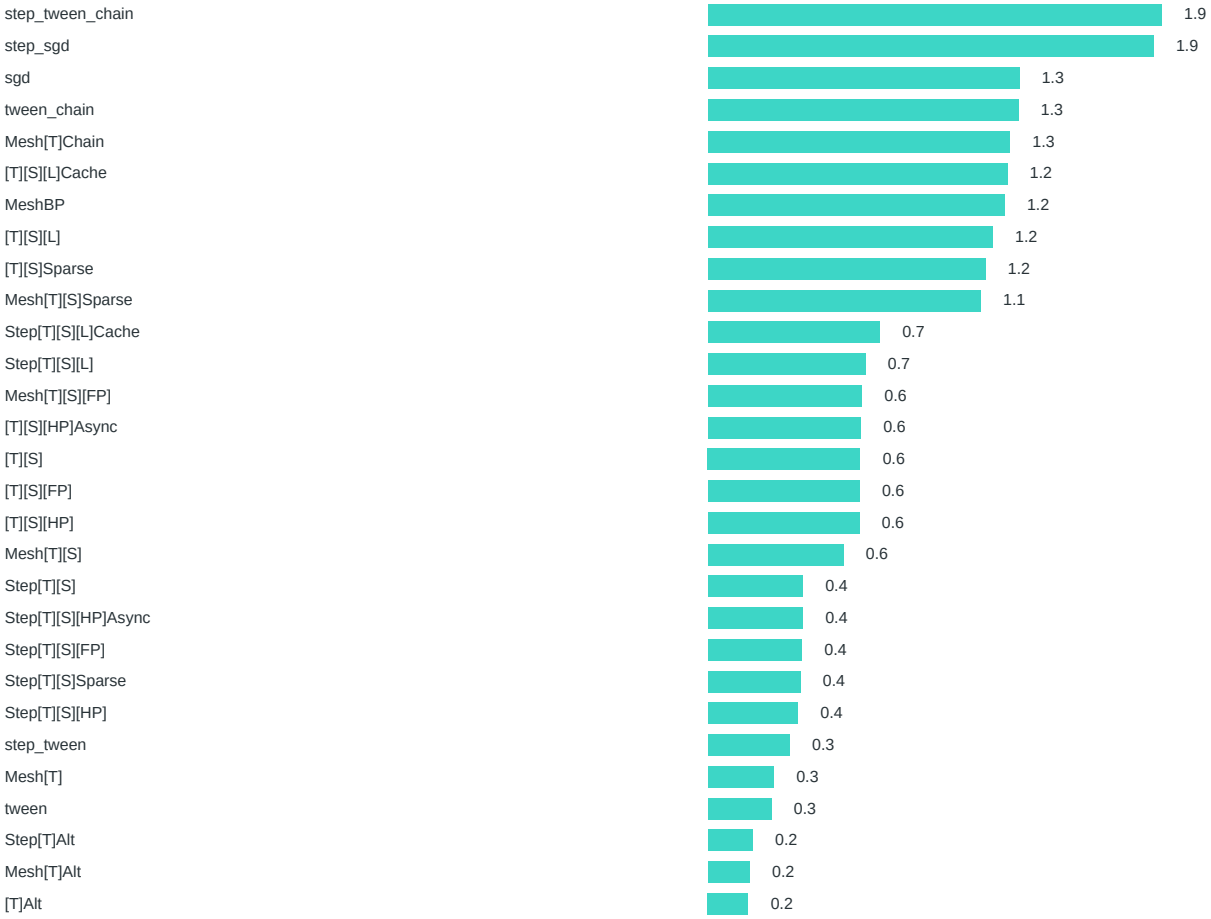
Best settings per mode



Best settings per mode



Mean Score by train mode



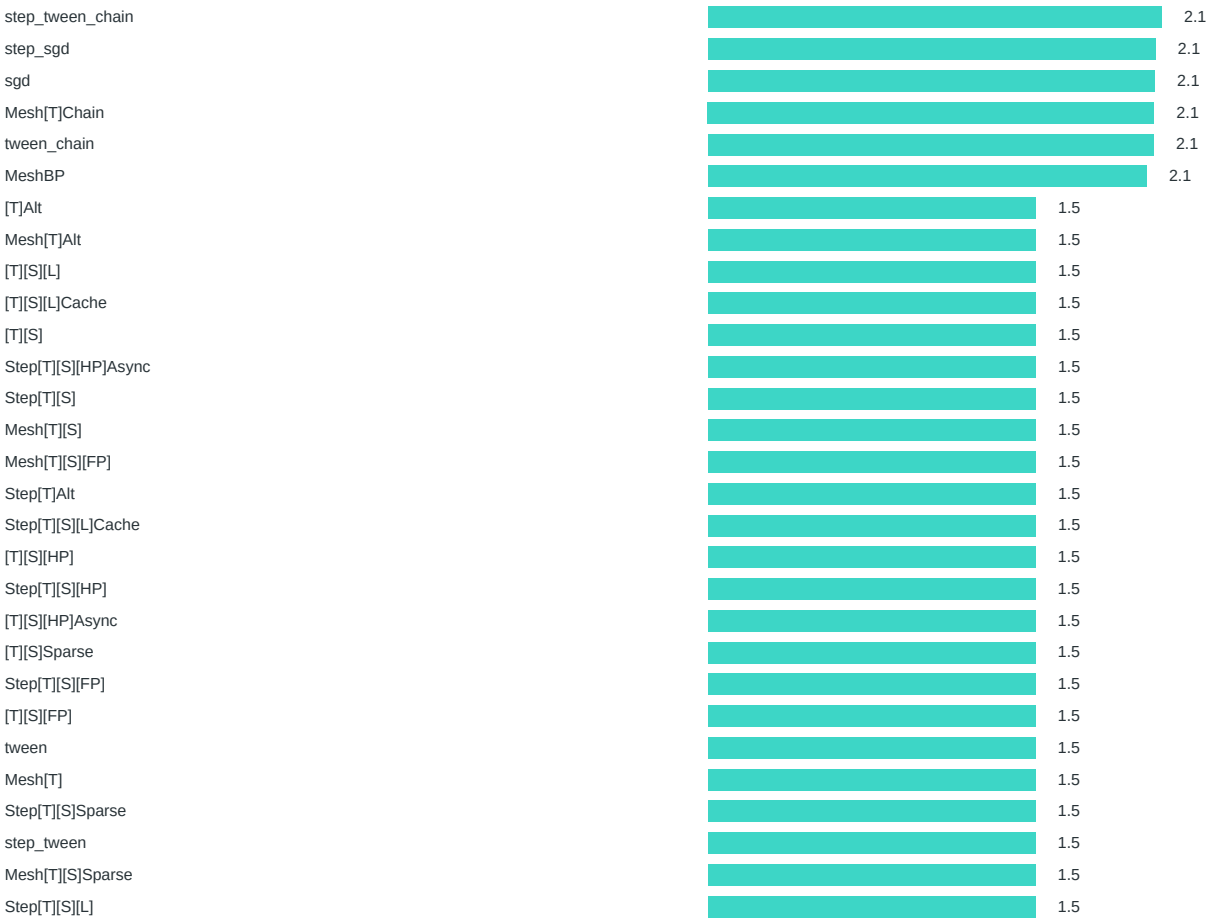
Mean hard Acc by train mode



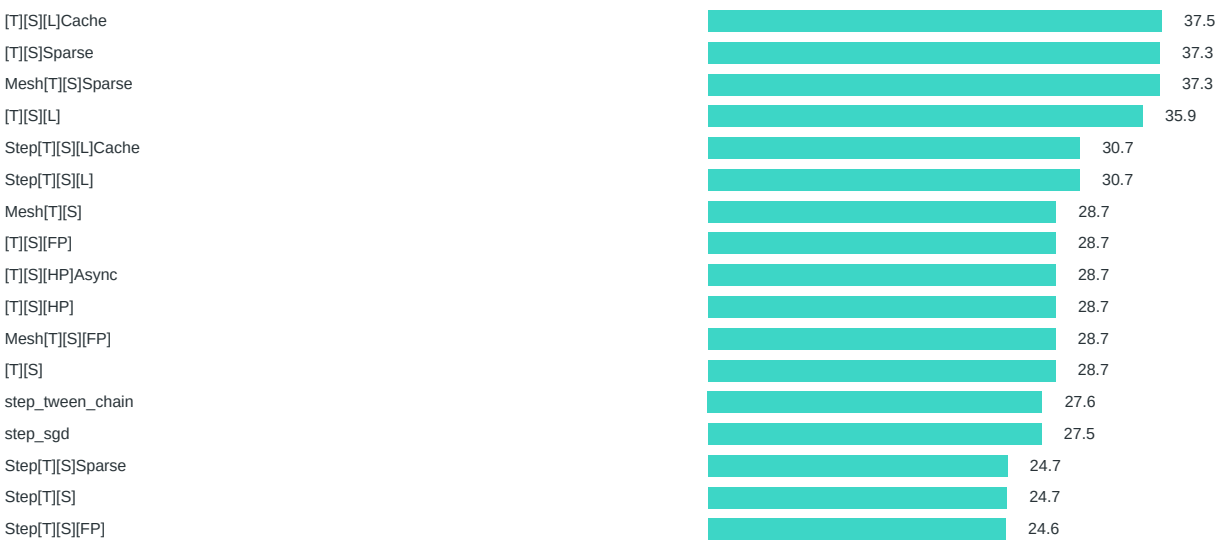
Mean hard Acc by train mode



Mean SoftAcc by train mode



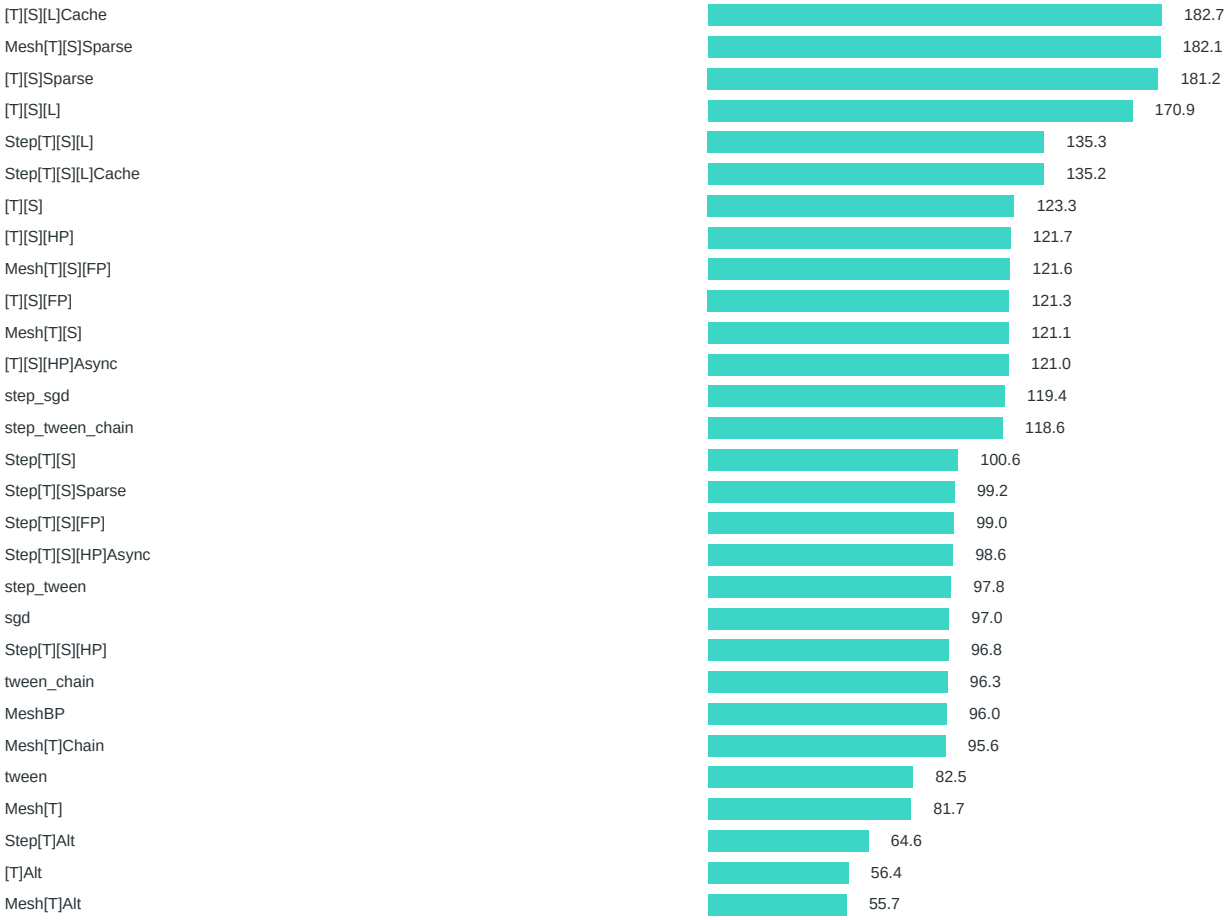
Mean Availability by train mode



Mean Availability by train mode



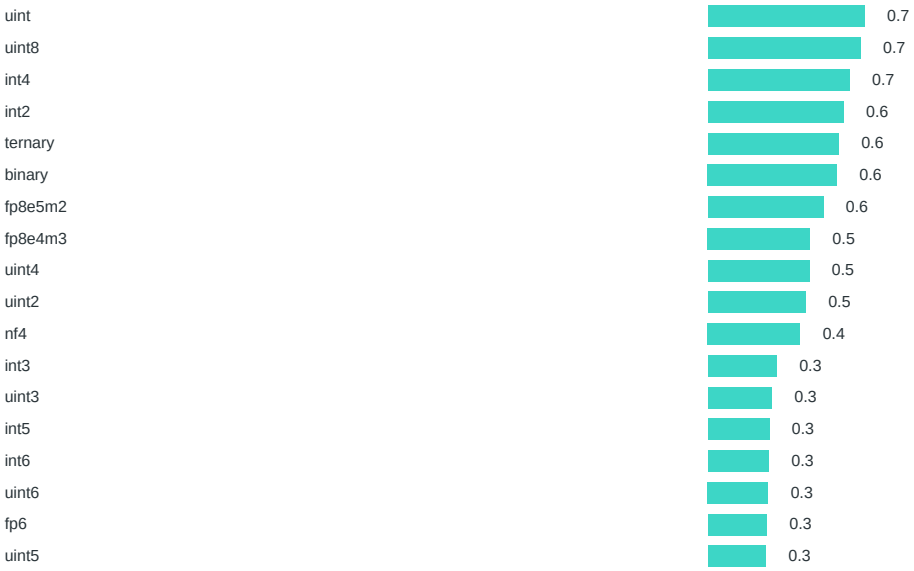
Mean Throughput by train mode



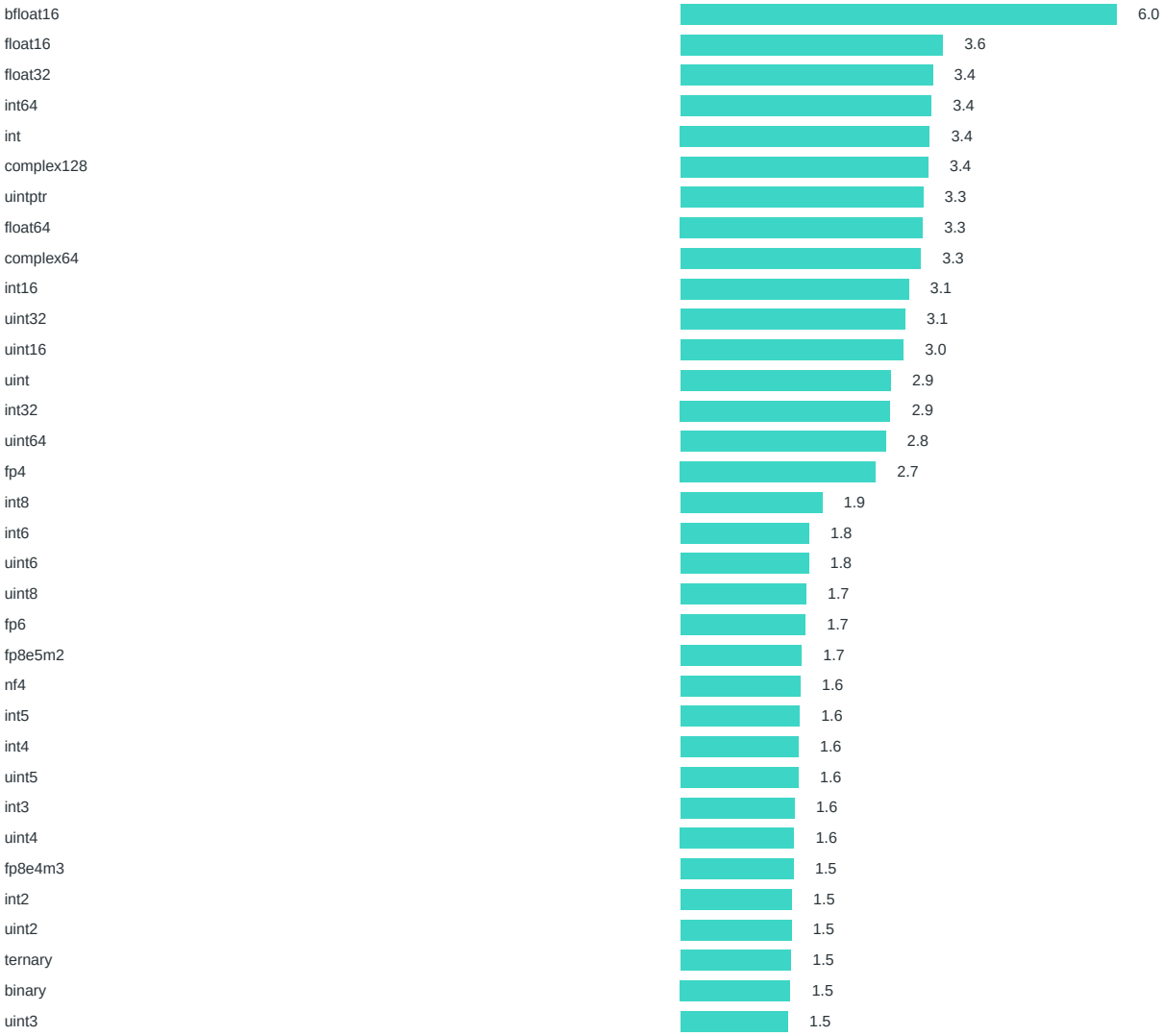
Mean Score by dtype



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

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

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

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

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

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

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

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

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

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	24	22	24	24	23	25	25	24	24	24	24	24
Mesh[T]	21	20	21	21	21	22	22	21	21	21	21	21
Mesh[T]Alt	16	14	16	16	15	16	16	15	16	16	16	16
Mesh[T]Chain	24	22	24	24	23	25	25	24	24	24	24	24
Mesh[T][S]	29	27	29	29	28	29	29	28	29	29	29	29
Mesh[T][S][FP]	29	27	29	29	28	29	29	28	29	29	29	29
Mesh[T][S]Sparse	37	37	37	37	37	37	38	37	37	38	37	37
Step[T]Alt	18	16	18	18	17	18	18	17	17	18	18	18
Step[T][S]	25	24	25	25	24	25	25	24	25	25	25	25
Step[T][S][FP]	25	23	25	25	24	25	25	24	25	25	25	25
Step[T][S][HP]	24	23	25	25	23	25	25	24	24	25	24	25
Step[T][S][HP]Async	25	23	25	25	24	25	25	24	25	25	25	25
Step[T][S][L]	31	31	31	31	31	31	31	30	30	31	31	31
Step[T][S][L]Cache	31	31	31	31	31	31	31	30	30	31	31	31
Step[T][S]Sparse	25	24	25	25	24	25	25	24	25	25	25	25
[T]Alt	16	14	16	16	15	16	16	15	16	16	16	16
[T][S]	29	27	29	29	28	29	29	28	29	29	29	29
[T][S][FP]	29	27	29	29	28	29	29	28	29	29	29	29
[T][S][HP]	29	27	29	29	28	29	29	28	29	29	29	29
[T][S][HP]Async	29	27	29	29	28	29	29	28	29	29	29	29
[T][S][L]	36	35	36	37	36	37	37	37	35	36	36	36
[T][S][L]Cache	38	37	38	38	38	38	38	37	37	38	37	38
[T][S]Sparse	37	37	37	37	37	37	38	37	37	37	37	37
sgd	24	22	24	24	23	25	24	23	23	24	24	24
step_sgd	28	26	28	28	27	29	29	27	27	28	28	28
step_tween	24	22	24	24	23	25	25	24	24	24	24	24
step_tween_chain	28	26	28	28	27	29	29	27	27	28	28	28
tween	21	20	21	21	20	22	22	21	21	21	21	21
tween_chain	24	22	24	24	23	24	25	23	24	24	24	24

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	24	23	24	24	22	24	23	24	24	24	22	24
Mesh[T]	21	20	21	21	20	21	21	21	21	21	20	21
Mesh[T]Alt	16	14	16	16	14	16	16	16	16	16	14	16
Mesh[T]Chain	24	22	24	24	22	23	24	24	24	24	22	24
Mesh[T][S]	29	27	29	29	27	29	29	29	28	29	27	29
Mesh[T][S][FP]	29	27	29	29	27	29	29	29	28	29	27	29
Mesh[T][S]Sparse	37	37	37	37	37	37	37	37	37	37	37	37
Step[T]Alt	18	16	18	18	16	17	17	18	17	17	16	18
Step[T][S]	25	24	25	25	24	25	25	25	24	25	23	25
Step[T][S][FP]	25	23	25	25	23	25	25	25	24	25	23	25
Step[T][S][HP]	25	23	24	25	23	24	24	25	24	24	22	24
Step[T][S][HP]Async	25	23	25	25	23	25	25	25	24	25	23	25
Step[T][S][L]	31	31	30	31	31	30	30	31	31	30	31	31
Step[T][S][L]Cache	31	30	31	31	31	30	30	31	31	30	31	31
Step[T][S]Sparse	25	24	25	25	24	25	25	25	24	25	23	25
[T]Alt	16	15	16	16	14	16	16	16	16	16	14	16
[T][S]	29	27	29	29	27	29	29	29	28	29	27	29
[T][S][FP]	29	27	29	29	27	29	29	29	28	29	27	29
[T][S][HP]	29	27	29	29	27	29	29	29	28	29	27	29
[T][S][HP]Async	29	27	29	29	27	29	29	29	28	29	27	29
[T][S][L]	37	35	35	37	35	35	35	37	36	36	34	36
[T][S][L]Cache	38	37	37	38	37	37	37	38	37	37	37	38
[T][S]Sparse	37	37	37	37	37	37	37	37	37	37	37	37
sgd	24	22	24	24	22	23	23	24	24	24	22	24
step_sgd	28	26	28	28	26	27	27	28	28	28	25	28
step_tween	24	23	24	24	22	24	24	24	24	24	22	24
step_tween_chain	28	26	28	28	26	27	27	28	28	28	25	28
tween	21	20	21	21	20	21	21	21	21	21	19	21
tween_chain	24	22	24	24	22	24	23	24	24	24	22	24

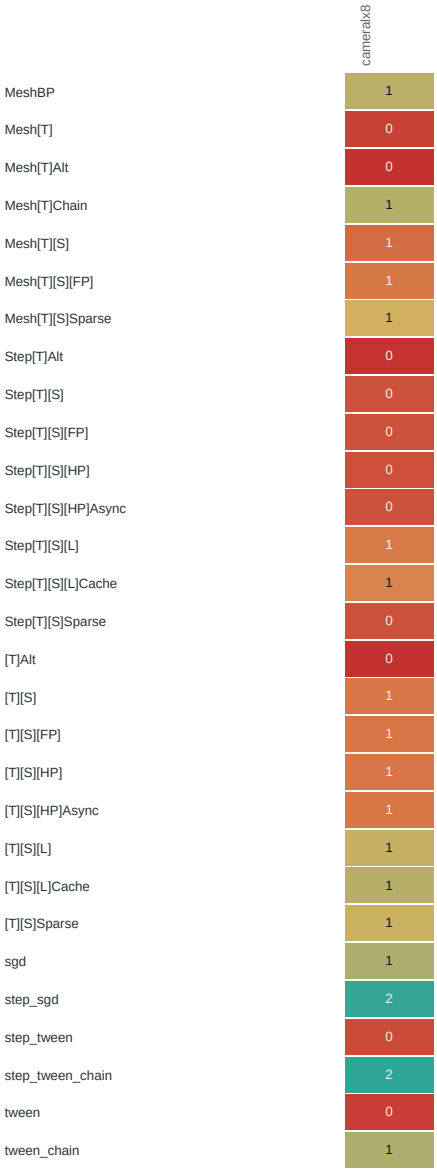
Honesty - mean Avail, every mode x dtype (cols 25-34)

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

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	24	24	23	24	24	23	23	24	24	24
Mesh[T]	21	21	21	21	21	21	21	21	21	21
Mesh[T]Alt	16	16	16	16	16	15	15	16	16	16
Mesh[T]Chain	24	24	23	24	24	23	23	24	24	24
Mesh[T][S]	29	29	29	29	29	29	29	29	29	29
Mesh[T][S][FP]	29	29	29	29	29	29	29	29	29	29
Mesh[T][S]Sparse	37	37	37	37	37	37	37	37	37	37
Step[T]Alt	18	18	17	18	18	17	17	18	18	17
Step[T][S]	25	25	25	25	25	25	25	25	25	25
Step[T][S][FP]	25	25	25	25	25	25	25	25	24	25
Step[T][S][HP]	24	24	24	24	24	24	24	24	24	24
Step[T][S][HP]Async	25	25	25	25	25	25	25	25	24	25
Step[T][S][L]	31	31	30	31	31	30	30	31	31	31
Step[T][S][L]Cache	31	31	30	31	31	30	30	31	31	31
Step[T][S]Sparse	25	25	25	25	25	25	25	25	25	25
[T]Alt	16	16	16	16	16	15	15	16	16	16
[T][S]	29	29	29	29	29	29	29	29	28	29
[T][S][FP]	29	29	29	29	29	29	29	29	29	29
[T][S][HP]	29	29	29	29	29	29	29	29	29	29
[T][S][HP]Async	29	29	29	29	29	29	29	29	29	29
[T][S][L]	36	36	35	36	36	35	35	36	36	36
[T][S][L]Cache	38	37	37	38	38	37	37	38	38	38
[T][S]Sparse	37	37	37	37	37	37	37	37	37	37
sgd	24	24	23	24	24	23	23	24	24	24
step_sgd	28	28	27	28	28	27	27	28	28	28
step_tween	24	24	24	24	24	24	24	24	24	24
step_tween_chain	28	28	27	28	28	27	27	28	28	28
tween	21	21	21	21	21	21	21	21	21	21
tween_chain	24	24	23	24	24	23	23	24	24	24

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

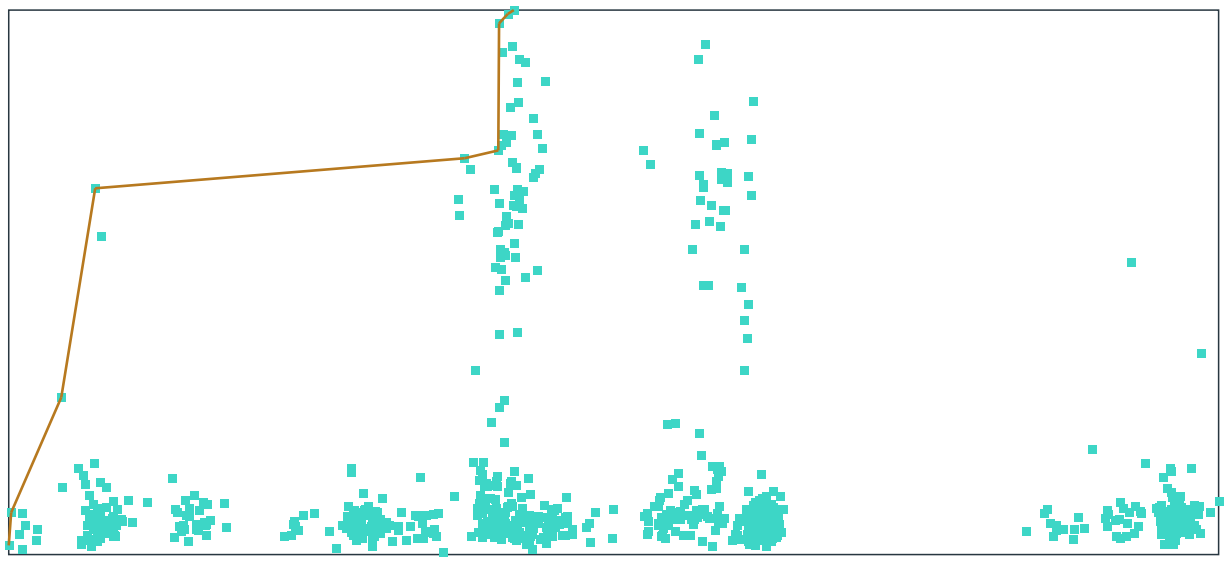


Mean Avail, every mode x arch

Mean Avail, every mode x arch

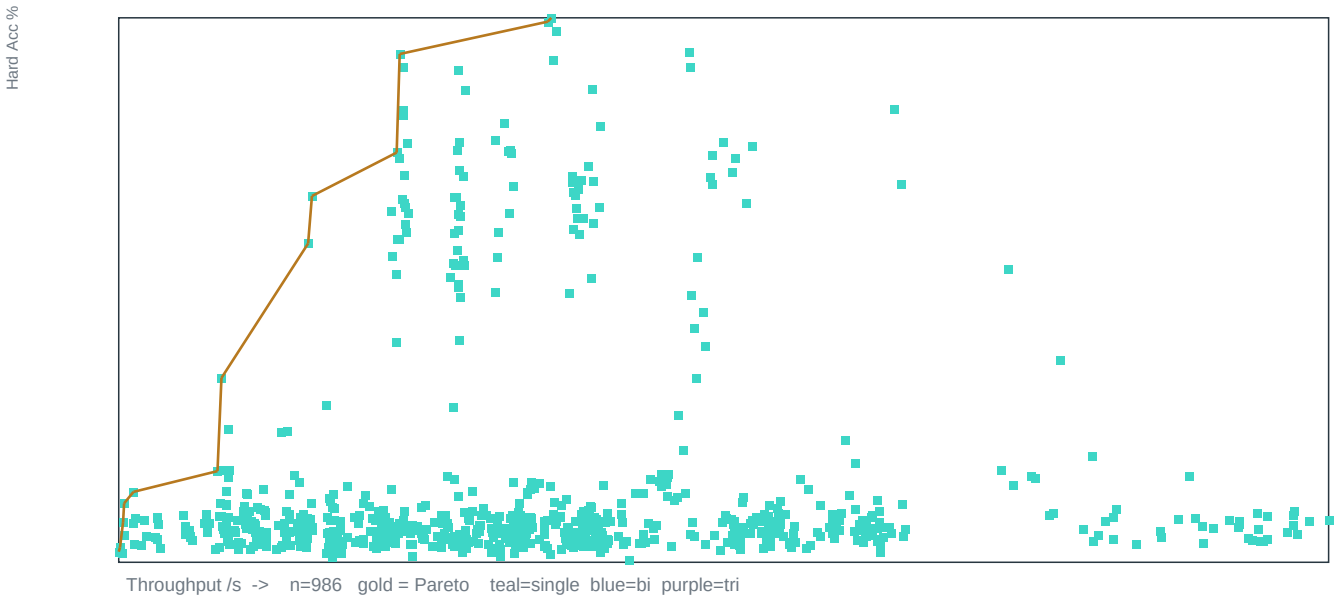
	cameralx8
MeshBP	24
Mesh[T]	21
Mesh[T]Alt	16
Mesh[T]Chain	24
Mesh[T][S]	29
Mesh[T][S][FP]	29
Mesh[T][S]Sparse	37
Step[T]Alt	17
Step[T][S]	25
Step[T][S][FP]	25
Step[T][S][HP]	24
Step[T][S][HP]Async	25
Step[T][S][L]	31
Step[T][S][L]Cache	31
Step[T][S]Sparse	25
[T]Alt	16
[T][S]	29
[T][S][FP]	29
[T][S][HP]	29
[T][S][HP]Async	29
[T][S][L]	36
[T][S][L]Cache	37
[T][S]Sparse	37
sgd	24
step_sgd	28
step_tween	24
step_tween_chain	28
tween	21
tween_chain	24

Pillars - Availability vs hard Acc

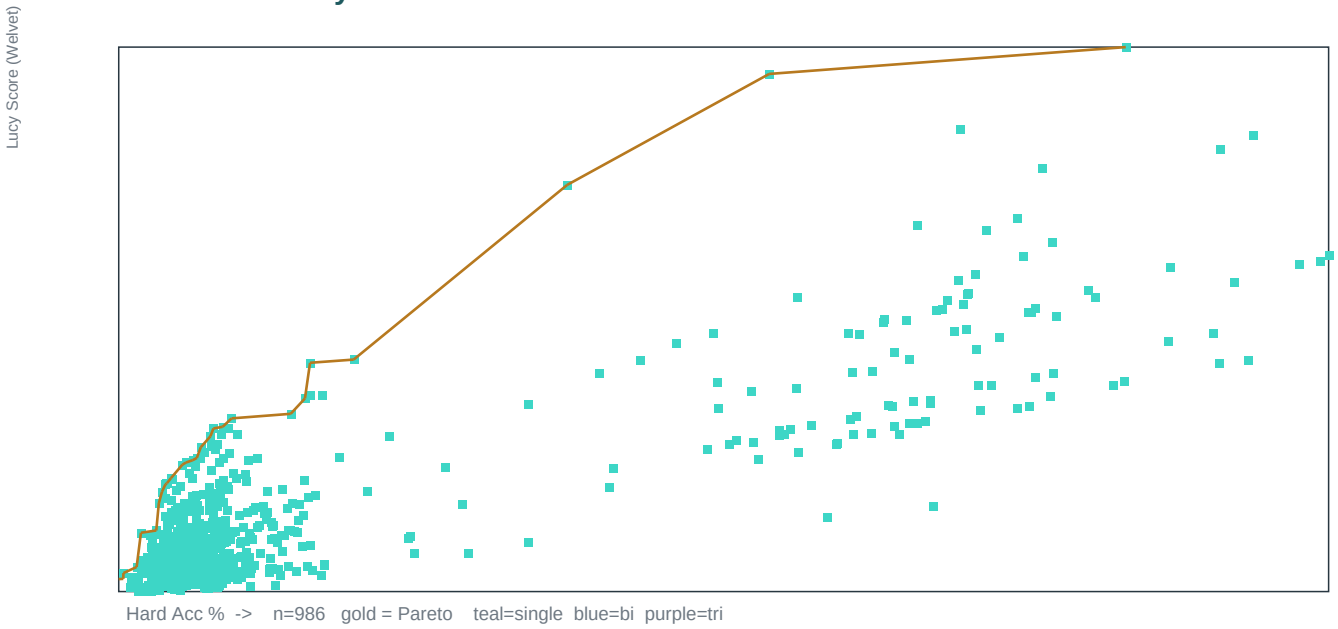



Availability % -> n=986 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

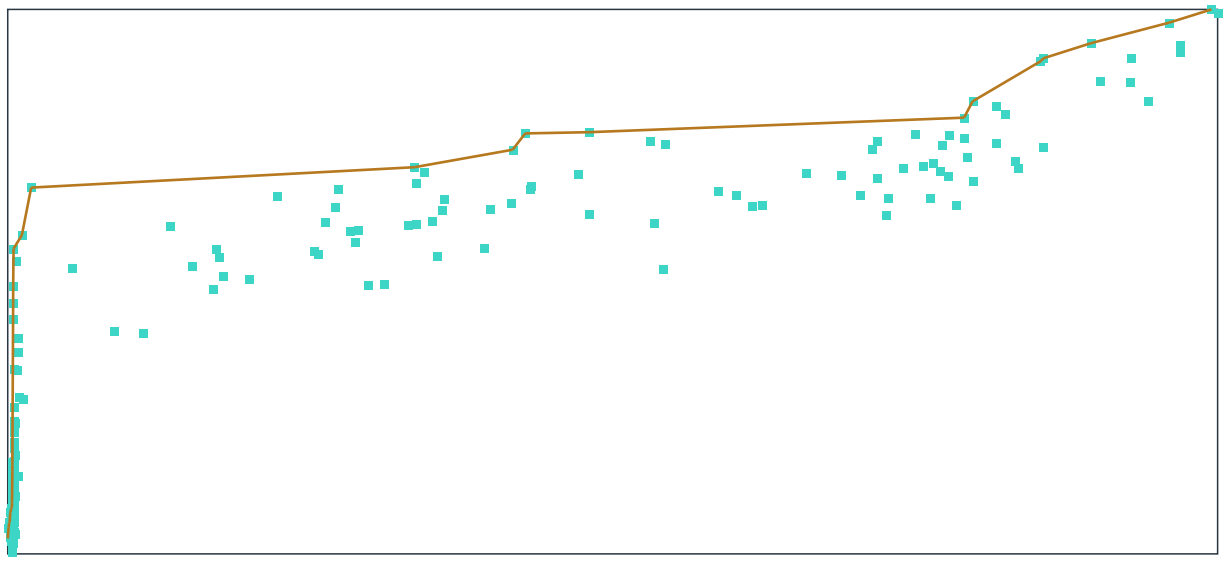
Pillars - Throughput vs hard Acc



Pareto - hard Acc vs Lucy Score

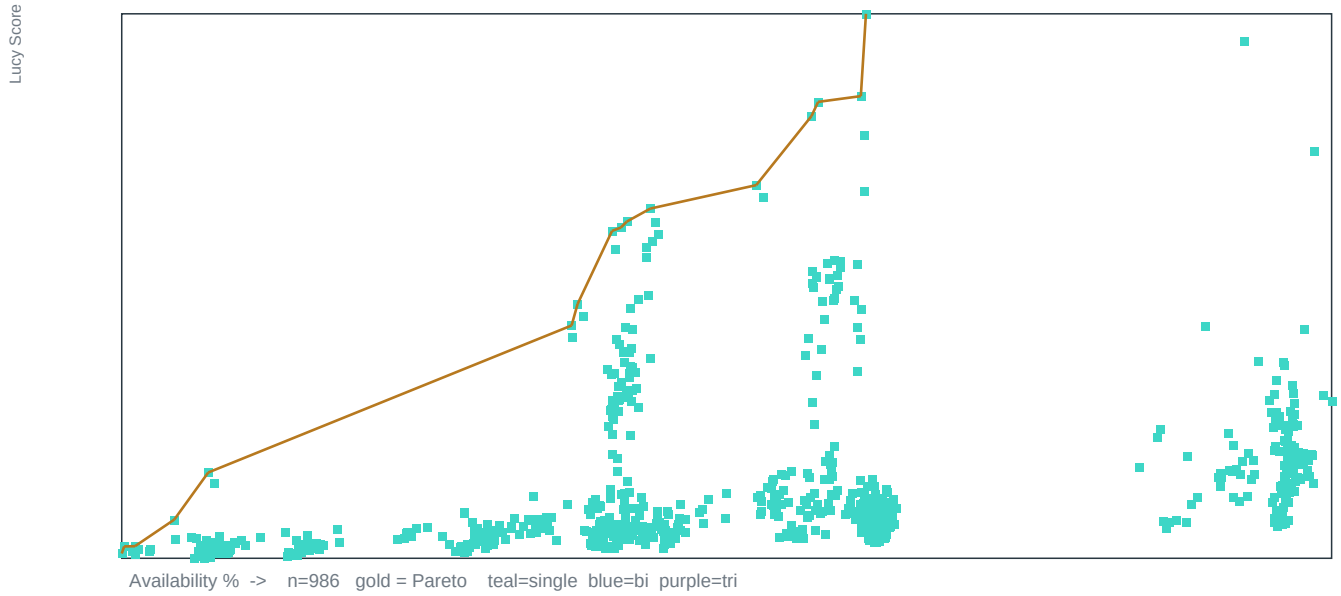


SoftAcc (serve-confidence) vs hard Acc




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

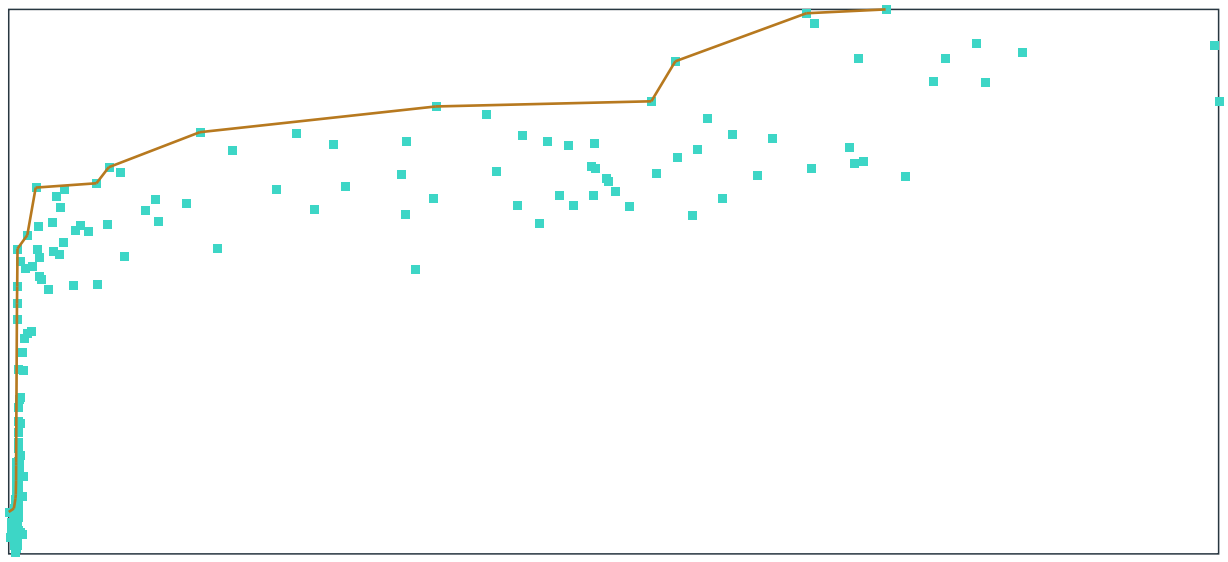
Avail vs Lucy Score (duty clock)



Pillars - Throughput vs Availability



AdaptPct vs hard Acc



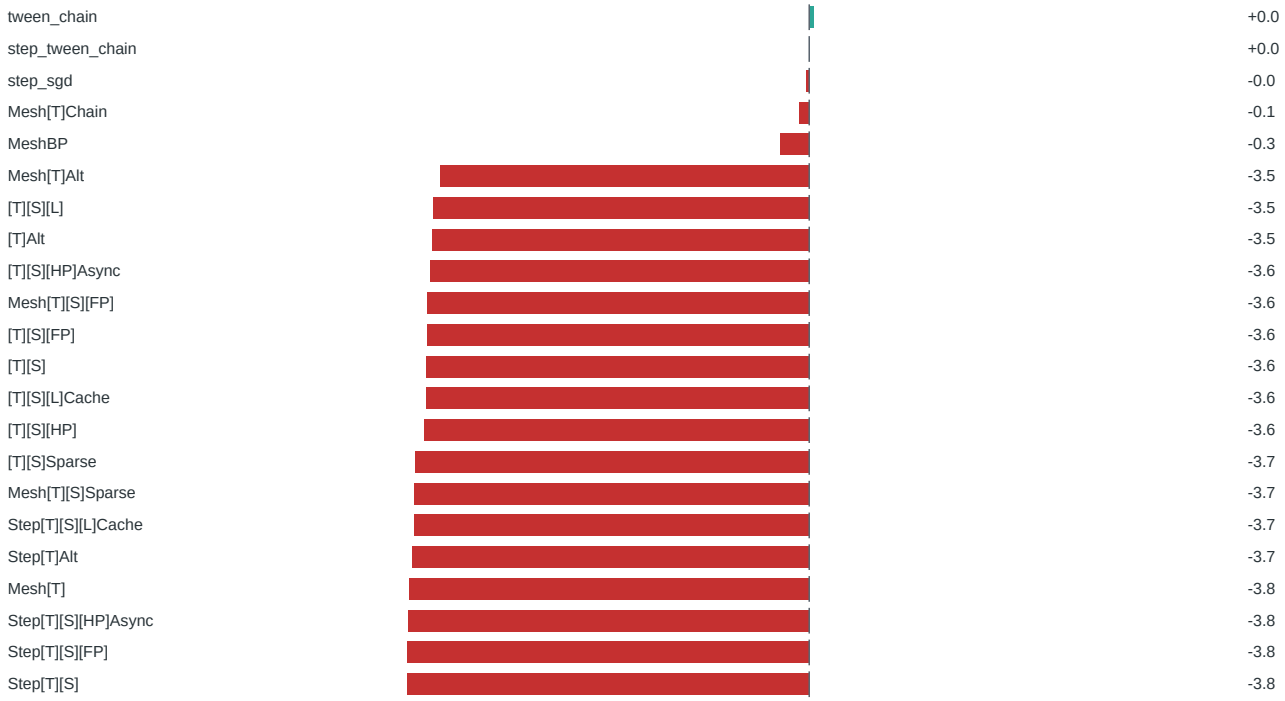

AdaptPct % -> n=986 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

vs sgd - matched dtype x format x arch

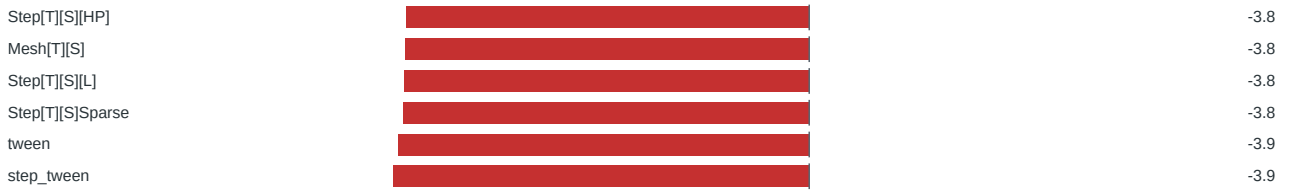
AccDelta is the honest column. ScoreDelta is usually Availability (duty clock), not a better chain rule. Acc win = AccDelta > 0.5. Score win = ScoreDelta > 1. Baseline is discovered from the board, not a frozen StepBP list.

mode	n	AccD	Acc win%	SoftD	AvailD	ThruD	ScoreD	Score win%
tween_chain	34	+0.0	26	-0.0	+0.0	-1	-0.0	0
step_tween_chain	34	+0.0	26	+0.0	+4.0	+22	+0.6	26
step_sgd	34	-0.0	24	+0.0	+4.0	+22	+0.6	26
Mesh[T]Chain	34	-0.1	15	-0.0	+0.1	-1	-0.0	0
MeshBP	34	-0.3	21	-0.0	+0.1	-1	-0.1	0
Mesh[T]Alt	34	-3.5	6	-0.6	-8.0	-41	-1.1	0
[T][S][L]	34	-3.5	0	-0.6	+12.3	+74	-0.1	9
[T]Alt	34	-3.5	3	-0.6	-8.0	-41	-1.1	0
[T][S][HP]Async	34	-3.6	6	-0.6	+5.1	+24	-0.7	0
Mesh[T][S][FP]	34	-3.6	3	-0.6	+5.1	+25	-0.7	0
[T][S][FP]	34	-3.6	0	-0.6	+5.1	+24	-0.7	0
[T][S]	34	-3.6	3	-0.6	+5.1	+26	-0.7	0
[T][S][L]Cache	34	-3.6	3	-0.6	+13.9	+86	-0.0	6
[T][S][HP]	34	-3.6	3	-0.6	+5.1	+25	-0.7	0
[T][S]Sparse	34	-3.7	12	-0.6	+13.7	+84	-0.1	21
Mesh[T][S]Sparse	34	-3.7	3	-0.6	+13.7	+85	-0.2	9
Step[T][S][L]Cache	34	-3.7	6	-0.6	+7.1	+38	-0.6	0
Step[T]Alt	34	-3.7	0	-0.6	-6.2	-32	-1.1	0
Mesh[T]	34	-3.8	3	-0.6	-2.6	-15	-1.0	0
Step[T][S][HP]Async	34	-3.8	0	-0.6	+1.0	+2	-0.9	0
Step[T][S][FP]	34	-3.8	6	-0.6	+1.0	+2	-0.9	0
Step[T][S]	34	-3.8	3	-0.6	+1.1	+4	-0.9	0
Step[T][S][HP]	34	-3.8	3	-0.6	+0.6	-0	-0.9	0
Mesh[T][S]	34	-3.8	3	-0.6	+5.2	+24	-0.7	0
Step[T][S][L]	34	-3.8	0	-0.6	+7.1	+38	-0.6	0
Step[T][S]Sparse	34	-3.8	0	-0.6	+1.2	+2	-0.9	0
tween	34	-3.9	6	-0.6	-2.7	-15	-1.0	0
step_tween	34	-3.9	0	-0.6	+0.3	+1	-1.0	0

mean AccD vs sgd



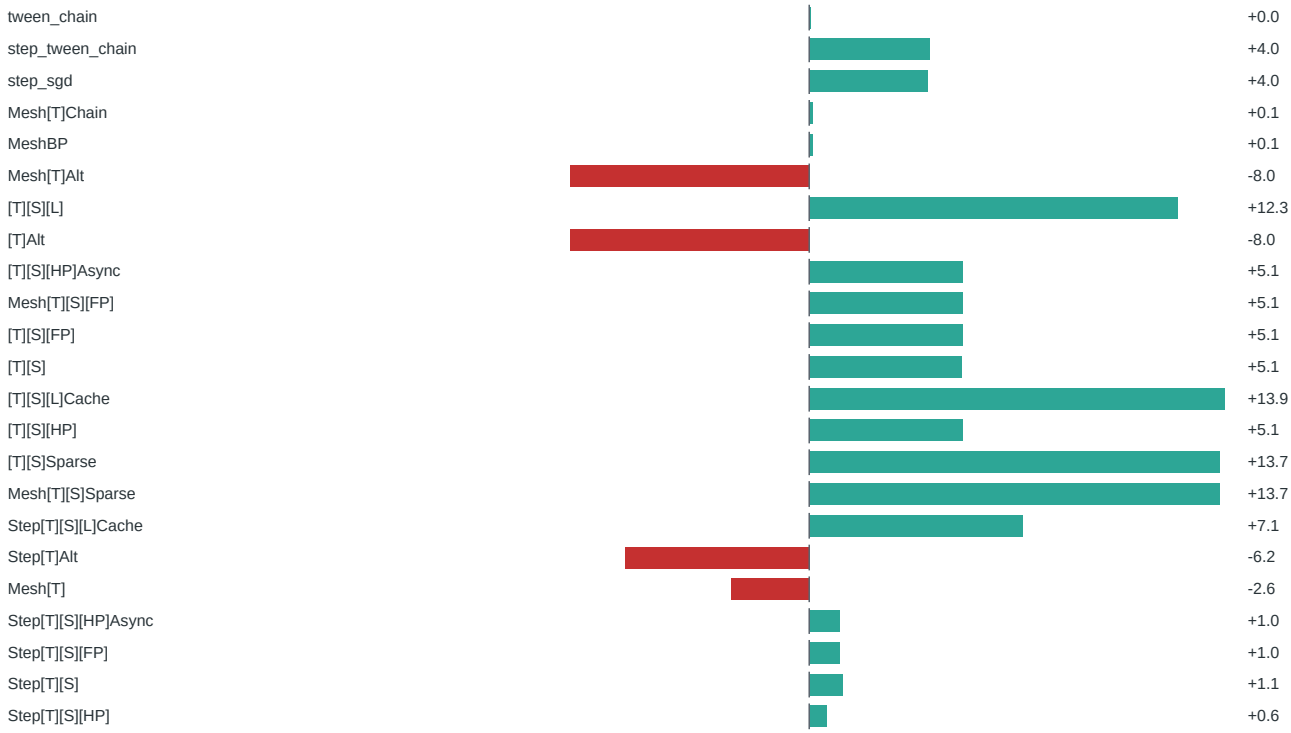
mean AccD vs sgd



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

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

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

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

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

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

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

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

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

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

AccD vs sgd, every mode x arch

AccD vs sgd, every mode x arch



Family collapse - Step* vs non-Step

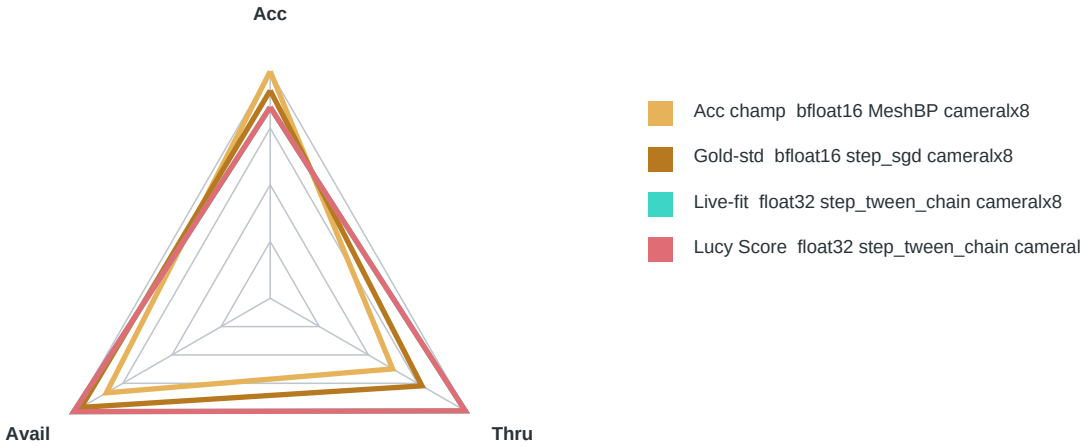
Step* is a 1D pipe (one sample enters layer 0 per tick; output is the sample that entered depth ticks ago). Non-Step of the same family is a full-chain update. AccD is a real scheduler split, not leftover warm-up forwards.

step	plain	n	mean |AccD|
Step[T]Alt	[T]Alt	34	0.53
Step[T][S]	[T][S]	34	0.41
Step[T][S][FP]	[T][S][FP]	34	0.49
Step[T][S][HP]	[T][S][HP]	34	0.51
Step[T][S][HP]Async	[T][S][HP]Async	34	0.44
Step[T][S][L]	[T][S][L]	34	0.50
Step[T][S][L]Cache	[T][S][L]Cache	34	0.38
Step[T][S]Sparse	[T][S]Sparse	34	0.26
step_sgd	sgd	34	0.66
step_tween	tween	34	0.26
step_tween_chain	tween_chain	34	0.75

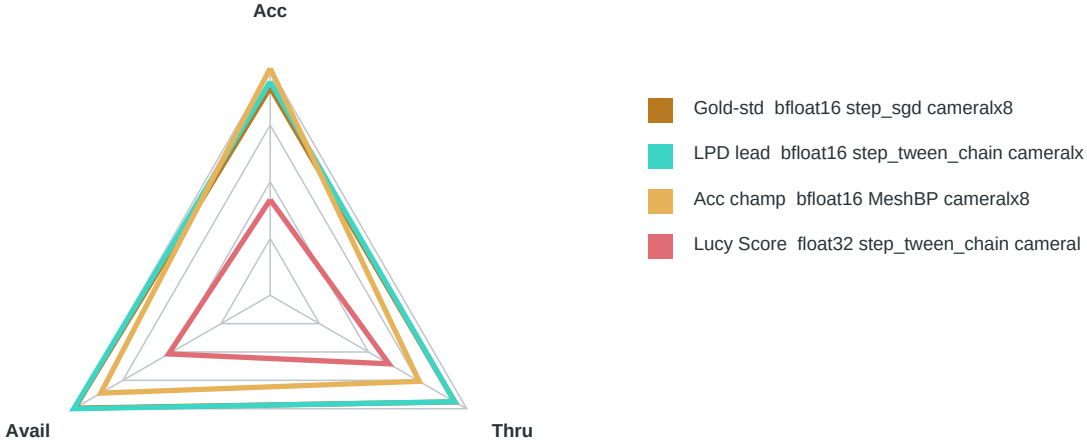
Consciousness - Acc, Throughput, Availability

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 bfloat16|none|MeshBP|cameralx8|simd Acc 13.6 Thru 116 Avail 24.1% 212.2 KiB (RAM reference)
Lucy Score champ (T x Avail x Acc) float32|none|step_tween_chain|cameralx8|simd Score 6.1 Acc 11.5 Soft 4 424.4 KiB
Live-fit champ (best Q) float32|none|step_tween_chain|cameralx8|simd Acc 11.5 Thru 185 Avail 28.9% 424.4 KiB
Gold-std (2+ pillars, Acc keep >= 80%, then smallest then fastest): bfloat16|none|step_sgd|cameralx8|simd mode step_sgd Acc 12.5 Thru 144 212.2 KiB
Board fastest float32|none|[T][S][L]Cache|cameralx8|simd Thru 272 (traps may own this) Best availability float64|none|[T][S][L]Cache|cameralx8|simd 38.2%
Learner Thru peak 186 learner Avail peak 28.9%

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
step_tween_chain	3	12.8	212.2	185	bfloat16 step_tween_chain cameralx8 / float32 step_tween_chain ca~
step_sgd	1	12.5	212.2	144	bfloat16 step_sgd cameralx8

Mode	n	Acc	KiB	Thru	Cell
sgd	3	13.3	212.2	126	bfloat16 sgd cameralx8 / float64 sgd cameralx8
MeshBP	3	13.6	212.2	124	bfloat16 MeshBP cameralx8 / float64 MeshBP cameralx8
tween_chain	2	12.6	212.2	116	bfloat16 tween_chain cameralx8
Mesh[T]Chain	4	13.5	212.2	115	bfloat16 Mesh[T]Chain cameralx8

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
keep	bfloat16 step_tween_chain cameralx8	94	77	97	89	100	1.0	0.89	12.8	144	212.2
keep	bfloat16 step_sgd cameralx8	92	77	96	88	100	1.0	0.88	12.5	144	212.2
-	float16 step_sgd cameralx8	76	82	92	83	100	1.0	0.83	10.3	153	212.2
-	float16 step_tween_chain cameralx8	73	82	93	82	100	1.0	0.82	10.0	152	212.2
keep	bfloat16 MeshBP cameralx8	100	62	83	80	100	1.0	0.80	13.6	116	212.2
keep	bfloat16 Mesh[T]Chain cameralx8	99	62	83	80	100	1.0	0.80	13.5	115	212.2
keep	bfloat16 sgd cameralx8	98	63	82	80	100	1.0	0.80	13.3	117	212.2
keep	bfloat16 tween_chain cameralx8	93	62	83	78	100	1.0	0.78	12.6	116	212.2
-	float16 Mesh[T]Chain cameralx8	74	66	80	73	100	1.0	0.73	10.1	123	212.2
-	float16 MeshBP cameralx8	73	65	80	72	100	1.0	0.72	9.9	120	212.2
-	uint16 tween_chain cameralx8	77	52	83	69	100	1.0	0.69	10.5	97	212.2
-	int16 sgd cameralx8	73	53	84	68	100	1.0	0.68	9.9	98	212.2
keep	float32 step_tween_chain cameralx8	84	99	100	94	200	0.5	0.47	11.5	185	424.4
-	float32 step_sgd cameralx8	71	100	100	89	200	0.5	0.45	9.7	186	424.4
-	float32 sgd cameralx8	79	81	85	81	200	0.5	0.41	10.7	151	424.4
-	float32 MeshBP cameralx8	76	80	85	80	200	0.5	0.40	10.4	148	424.4
-	float32 Mesh[T]Chain cameralx8	73	79	85	79	200	0.5	0.39	9.9	148	424.4
-	float32 tween_chain cameralx8	71	80	85	78	200	0.5	0.39	9.7	148	424.4
-	int32 step_tween_chain cameralx8	72	65	98	77	200	0.5	0.39	9.8	121	424.4
-	uint32 tween_chain cameralx8	79	52	83	70	200	0.5	0.35	10.7	98	424.4

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

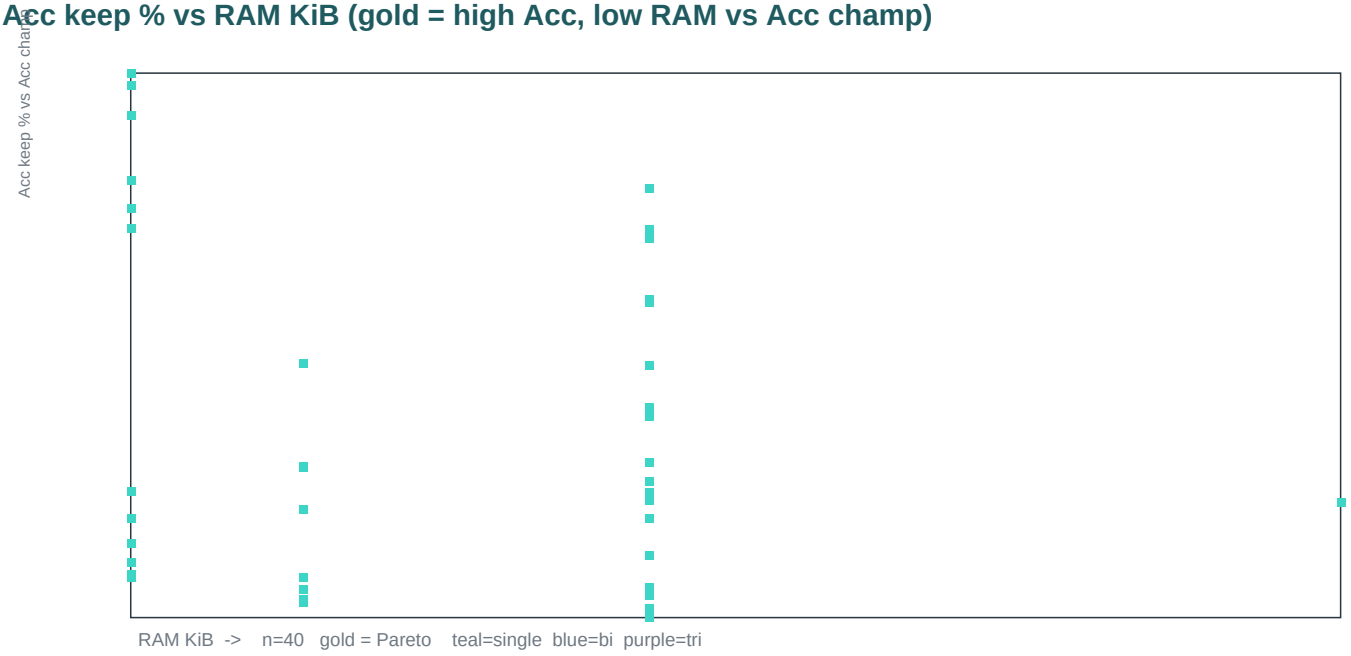
Band	Cell	Acc%	Thru%	Avail%	Q%	LPD	Thru	Avail
keep	float32 step_tween_chain cameralx8	84	99	100	94	0.47	185	28.9
-	float32 step_sgd cameralx8	71	100	100	89	0.45	186	28.8
keep	bfloat16 step_tween_chain cameralx8	94	77	97	89	0.89	144	27.9
keep	bfloat16 step_sgd cameralx8	92	77	96	88	0.88	144	27.8
-	float64 step_sgd cameralx8	78	84	100	87	0.22	156	28.8
-	float16 step_sgd cameralx8	76	82	92	83	0.83	153	26.7
-	float16 step_tween_chain cameralx8	73	82	93	82	0.82	152	26.8
-	float32 sgd cameralx8	79	81	85	81	0.41	151	24.5
keep	bfloat16 MeshBP cameralx8	100	62	83	80	0.80	116	24.1
-	float32 MeshBP cameralx8	76	80	85	80	0.40	148	24.6

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

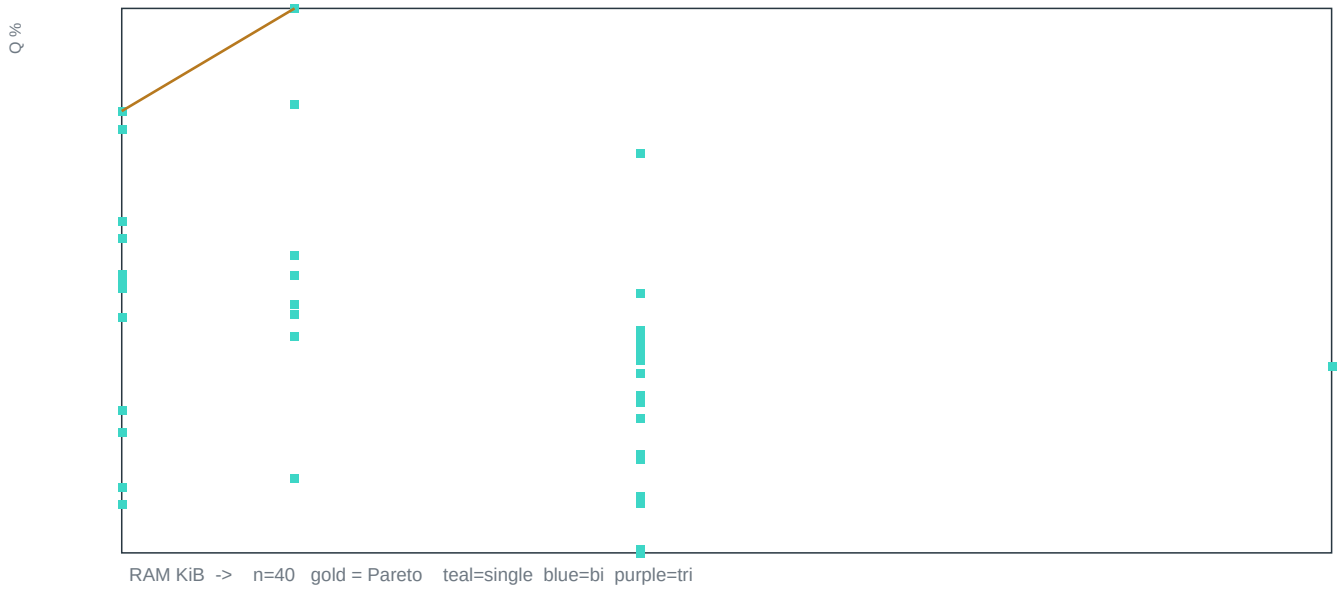
Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
trap	binary sgd cameralx8	13	68	77	40	6	16.0	0.00	1.7	127	13.3
trap	binary step_sgd cameralx8	8	83	89	39	6	16.0	0.00	1.1	154	13.3
trap	binary tween cameralx8	12	58	68	36	6	16.0	0.00	1.6	109	13.3
trap	binary tween_chain cameralx8	19	68	77	46	6	16.0	0.00	2.6	127	13.3
trap	binary step_tween cameralx8	10	68	77	37	6	16.0	0.00	1.3	127	13.3
trap	binary step_tween_chain cameralx8	11	82	88	43	6	16.0	0.00	1.4	152	13.3
trap	binary MeshBP cameralx8	9	68	77	36	6	16.0	0.00	1.2	126	13.3
trap	binary Mesh[T] cameralx8	10	58	68	34	6	16.0	0.00	1.4	108	13.3

trap	binary Mesh[T]Chain cameralx8	11	67	77	39	6	16.0	0.00	1.5	125	13.3
trap	binary [T][S] cameralx8	10	87	94	44	6	16.0	0.00	1.4	163	13.3

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

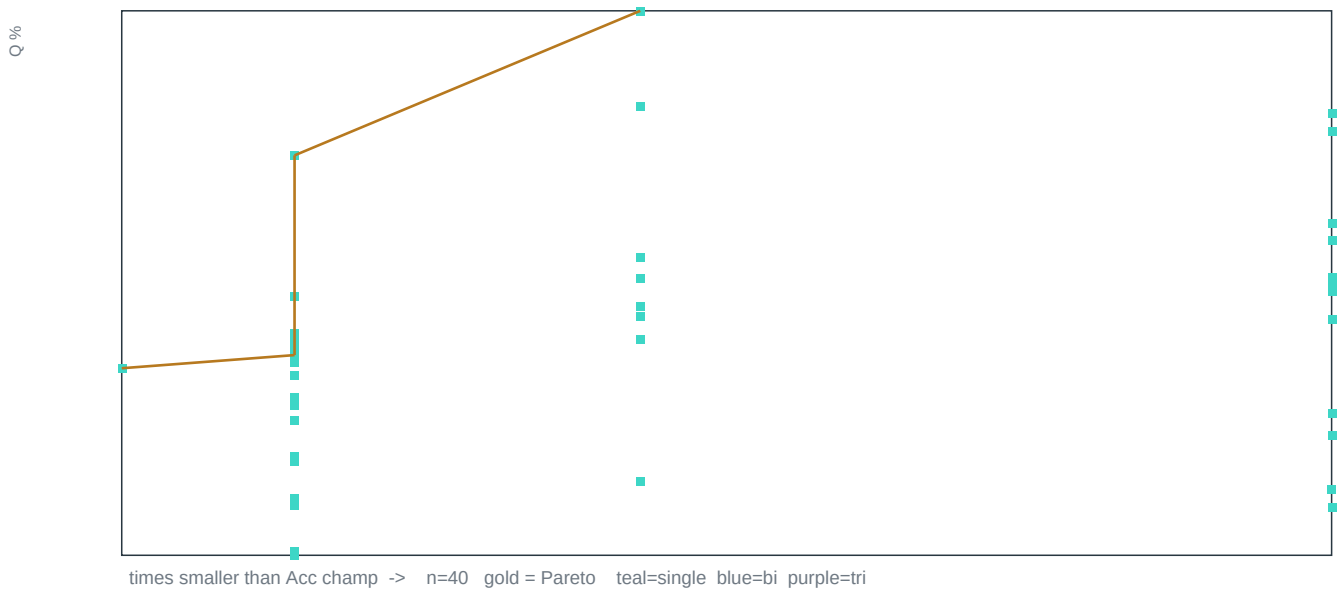


Q% vs RAM KiB (gold = high consciousness, low RAM)



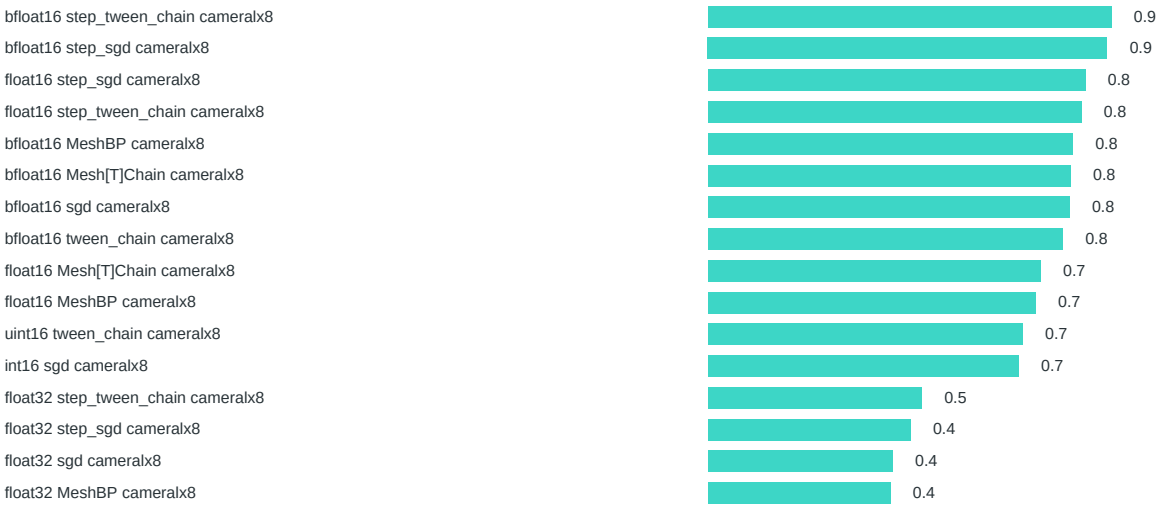
Q% vs shrink vs Acc champ (gold = upper right)

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

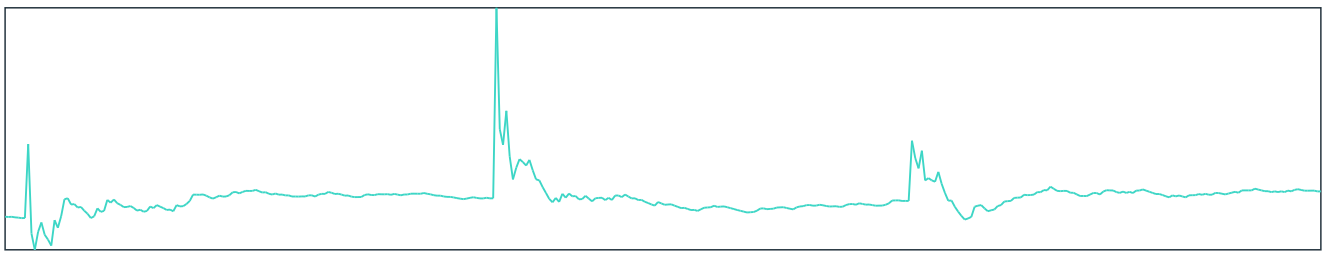


times smaller than Acc champ -> n=40 gold = Pareto teal=single blue=bi purple=tri

Top Lucy density (LPD)

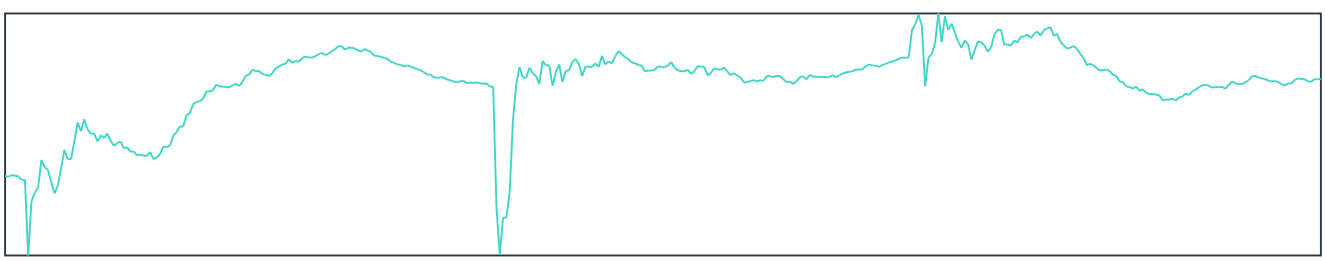


Live pulse (Score)



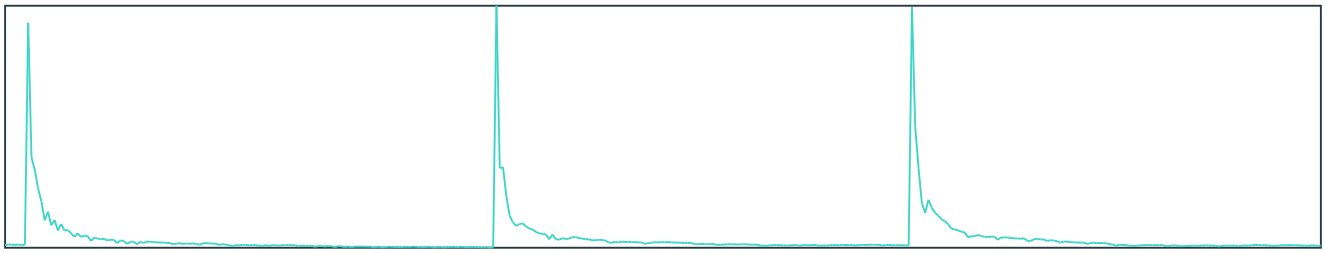
n=400 min=0.07 max=0.82

Live pulse (SoftAcc)



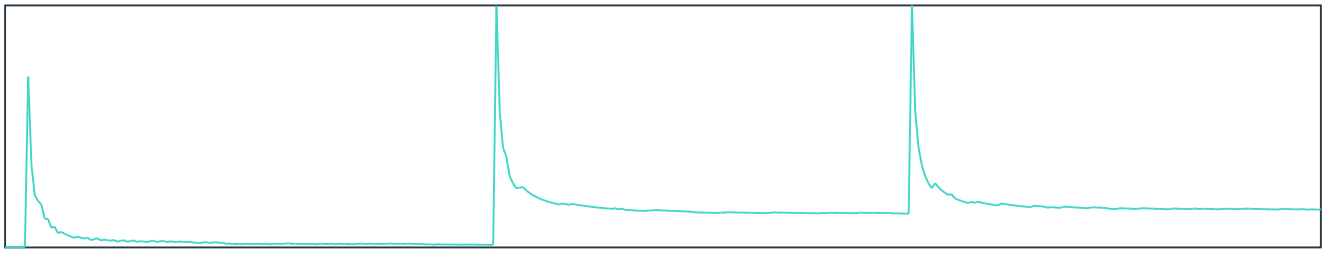
n=400 min=1.54 max=1.54

Live pulse (Availability)



n=400 min=24.81 max=40.90

Live pulse (Throughput)



n=400 min=57.58 max=111.81

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