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 2 - 2026-08-21 09:11:05 - 0.0.0.0:8155
This epoch 986 / 986 cells. Recorded 986 results. Learning rate 2.
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 - cameralx15 - tinyshakespeare - 4096 windows - seq 32 - causal MHA - A->B->A2 - SIMD

Lucy champions (this tide)

Axis	Cell	Score	Soft	Acc	Thru	Avail
hard acc	uintptr|none|[T]Alt|cameralx15|simd	1.19	5.7	7.5	98.3	16.1
throughput	float32|none|[T][S]Sparse|cameralx15|simd	8.93	0.4	3.0	761.0	38.9
availability	float32|none|Mesh[T][S]Sparse|cameralx15|simd	8.77	0.5	3.0	757.8	39.1
lucy score	int8|none|Mesh[T][S]Sparse|cameralx15|simd	22.80	2.8	8.5	694.5	38.8
mobile score (trap)	int2|none|[T][S]Sparse|cameralx15|simd	14.97	1.8	5.8	669.6	38.4
acc/sec	int8|none|Mesh[T][S]Sparse|cameralx15|simd	22.80	2.8	8.5	694.5	38.8

Lucy axis champions (this tide)

Axis	Mode	DType	Arch	Value
hard_acc	[T][S][FP]	uint6	cameralx15	12.90
throughput	[T][S]Sparse	float32	cameralx15	760.99
availability	Mesh[T][S]Sparse	float32	cameralx15	39.15
score	Mesh[T][S]Sparse	int8	cameralx15	22.80
soft_acc	[T]Alt	uintptr	cameralx15	5.74
acc_thru	Mesh[T][S]Sparse	int8	cameralx15	58.72
realtime	Mesh[T][S]Sparse	float32	cameralx15	296.66
adapt	[T]Alt	fp4	cameralx15	6.92
keep_learn	[T][S][HP]	int8	cameralx15	10.39
acc_per_sec	Mesh[T][S]Sparse	int8	cameralx15	0.72
consistency	[T][S][L]Cache	float64	cameralx15	11.76
stability	sgd	fp4	cameralx15	100.00
mobile_score	[T][S]Sparse	int2	cameralx15	457.37
lpd	Mesh[T][S][FP]	int3	cameralx15	1.29
mspeed	[T][S]	float32	cameralx15	1.00
mavail	[T][S][FP]	int32	cameralx15	1.00
mix	Mesh[T][S][FP]	uint8	cameralx15	0.89
gold_std	Mesh[T][S][FP]	int3	cameralx15	50.29

Best settings per train mode

Mode	DType	Format	Score	Soft	Acc	Avail	n
Mesh[T][S]Sparse	int8	none	22.8	2.8	8.5	38.8	34
[T][S]Sparse	int8	none	22.6	2.9	8.3	38.7	34
[T][S][L]Cache	int8	none	20.4	4.2	8.3	37.5	34
[T][S][L]	int8	none	15.0	4.7	7.4	34.7	34
Step[T][S][L]Cache	float32	none	12.0	1.6	7.2	31.9	34
Mesh[T][S][FP]	uint8	none	11.7	3.4	11.1	28.5	34
[T][S]	float32	none	11.6	4.5	9.2	28.8	34
[T][S][FP]	uint8	none	10.5	3.3	9.7	28.6	34
Mesh[T][S]	float32	none	10.3	4.7	8.1	28.7	34
[T][S][HP]	uint8	none	9.7	3.4	9.1	28.4	34
Step[T][S][L]	float64	none	9.3	1.6	7.8	32.1	34

Step[T][S]Sparse	float32	none	8.2	1.6	8.9	25.1	34
[T][S][HP]Async	int8	none	8.1	4.1	7.1	27.9	34
Step[T][S][FP]	float32	none	7.0	1.6	7.7	25.0	34
Step[T][S][HP]Async	float32	none	6.2	1.6	6.8	25.0	34
Step[T][S][HP]	float32	none	6.0	1.6	6.6	25.0	34
Mesh[T]Chain	int8	none	5.5	4.4	7.4	23.0	34
step_tween_chain	uint8	none	5.3	4.0	5.4	27.3	34
Step[T][S]	int8	none	5.2	1.6	6.1	24.2	34
sgd	int8	none	5.2	4.3	7.2	22.4	34
tween_chain	int8	none	4.9	4.2	6.9	22.5	34
step_sgd	int4	none	4.4	4.1	5.6	23.9	34
MeshBP	int2	none	4.2	4.8	7.4	20.6	34
tween	float32	none	3.9	1.5	6.1	21.5	34
step_tween	float32	none	3.8	1.5	4.1	24.9	34
Mesh[T]	bfloat16	none	3.3	1.5	7.5	21.6	34
Step[T]Alt	float32	none	3.0	1.6	7.0	17.8	34
Mesh[T]Alt	float32	none	2.5	0.2	2.7	24.4	34
[T]Alt	float32	none	2.5	0.2	2.6	24.4	34

Best dtype per mode

Mode	Winner dtype	Score	Soft	Acc
Mesh[T][S]Sparse	int8	22.8	2.8	8.5
[T][S]Sparse	int8	22.6	2.9	8.3
[T][S][L]Cache	int8	20.4	4.2	8.3
[T][S][L]	int8	15.0	4.7	7.4
Step[T][S][L]Cache	float32	12.0	1.6	7.2
Mesh[T][S][FP]	uint8	11.7	3.4	11.1
[T][S]	float32	11.6	4.5	9.2
[T][S][FP]	uint8	10.5	3.3	9.7
Mesh[T][S]	float32	10.3	4.7	8.1
[T][S][HP]	uint8	9.7	3.4	9.1
Step[T][S][L]	float64	9.3	1.6	7.8
Step[T][S]Sparse	float32	8.2	1.6	8.9
[T][S][HP]Async	int8	8.1	4.1	7.1
Step[T][S][FP]	float32	7.0	1.6	7.7
Step[T][S][HP]Async	float32	6.2	1.6	6.8
Step[T][S][HP]	float32	6.0	1.6	6.6
Mesh[T]Chain	int8	5.5	4.4	7.4
step_tween_chain	uint8	5.3	4.0	5.4
Step[T][S]	int8	5.2	1.6	6.1
sgd	int8	5.2	4.3	7.2
tween_chain	int8	4.9	4.2	6.9
step_sgd	int4	4.4	4.1	5.6
MeshBP	int2	4.2	4.8	7.4
tween	float32	3.9	1.5	6.1
step_tween	float32	3.8	1.5	4.1
Mesh[T]	bfloat16	3.3	1.5	7.5
Step[T]Alt	float32	3.0	1.6	7.0
Mesh[T]Alt	float32	2.5	0.2	2.7
[T]Alt	float32	2.5	0.2	2.6

Best mode per dtype

DType	Winner mode	Score	Soft	Acc
int8	Mesh[T][S]Sparse	22.8	2.8	8.5
uint8	Mesh[T][S]Sparse	20.6	3.2	9.0
int4	Mesh[T][S]Sparse	19.7	2.2	8.0
int2	[T][S]Sparse	15.0	1.8	5.8
float32	[T][S][L]	14.5	5.1	5.8
uint16	[T][S]Sparse	13.4	2.7	9.0
uint64	[T][S][L]Cache	11.2	4.2	7.9
uint32	Mesh[T][S]Sparse	11.0	2.2	7.2
int32	Mesh[T][S]Sparse	10.9	2.8	7.6
int16	[T][S]Sparse	10.9	2.4	7.6
float64	[T][S][L]	10.7	5.1	6.0
bfloat16	Mesh[T][S]	10.2	4.1	11.3
uintptr	[T][S][L]Cache	10.1	4.3	8.5
uint	[T][S][L]Cache	10.1	4.3	8.6
float16	Mesh[T][S]	9.6	4.6	10.0
nf4	Mesh[T][S]Sparse	8.2	2.0	7.3
uint4	[T][S][L]Cache	8.0	1.5	6.0
fp8e5m2	[T][S][L]	7.9	3.2	6.7
int64	Step[T][S][L]	7.7	1.6	8.9
complex64	[T][S][L]	6.5	5.2	6.2
complex128	Step[T][S][L]	6.4	1.6	8.7
fp8e4m3	[T][S]Sparse	6.3	5.0	4.9
int3	Mesh[T][S]Sparse	5.9	2.1	7.1
int	Step[T][S][L]	5.9	1.6	8.1
uint5	[T][S]Sparse	5.2	2.3	7.3
int6	Mesh[T][S]Sparse	5.2	2.4	8.1
fp6	Mesh[T][S]Sparse	5.0	2.3	7.8
int5	Mesh[T][S]Sparse	5.0	1.9	7.2
fp4	[T][S]Sparse	4.8	1.5	2.6
uint6	Mesh[T][S]Sparse	4.7	2.3	7.3
ternary	[T][S][L]Cache	4.4	1.5	1.9
binary	step_sgd	4.3	4.1	5.4
uint3	[T][S][FP]	3.9	1.6	8.7
uint2	step_tween_chain	3.6	4.0	6.2

Leaderboard (Lucy Score)

#	Cell	Score	Soft	Acc	Thru	Avail
1	int8|none|Mesh[T][S]Sparse|cameralx15|simd	22.8	2.8	8.5	694.5	38.8
2	int8|none|[T][S]Sparse|cameralx15|simd	22.6	2.9	8.3	701.8	38.7
3	uint8|none|Mesh[T][S]Sparse|cameralx15|simd	20.6	3.2	9.0	596.3	38.7
4	int8|none|[T][S][L]Cache|cameralx15|simd	20.4	4.2	8.3	657.4	37.5
5	int4|none|Mesh[T][S]Sparse|cameralx15|simd	19.7	2.2	8.0	638.0	38.4
6	int4|none|[T][S]Sparse|cameralx15|simd	17.2	2.2	7.0	642.5	38.5
7	uint8|none|[T][S][L]Cache|cameralx15|simd	17.2	4.0	8.0	568.9	37.6
8	uint8|none|[T][S]Sparse|cameralx15|simd	15.7	2.4	6.7	602.3	38.7
9	int8|none|[T][S][L]|cameralx15|simd	15.0	4.7	7.4	580.9	34.7
10	int2|none|[T][S]Sparse|cameralx15|simd	15.0	1.8	5.8	669.6	38.4
11	int2|none|Mesh[T][S]Sparse|cameralx15|simd	14.7	2.2	5.8	667.2	38.1
12	float32|none|[T][S][L]|cameralx15|simd	14.5	5.1	5.8	663.7	37.5
13	uint16|none|[T][S]Sparse|cameralx15|simd	13.4	2.7	9.0	387.6	38.7
14	uint8|none|[T][S][L]|cameralx15|simd	12.9	4.3	7.3	508.8	34.8

15	float32|none|Step[T][S][L]Cache|cameralx15|simd	12.0	1.6	7.2	518.3	31.9
16	uint8|none|Mesh[T][S][FP]|cameralx15|simd	11.7	3.4	11.1	370.7	28.5
17	uint16|none|[T][S][L]Cache|cameralx15|simd	11.6	4.3	8.1	375.2	38.0
18	float32|none|[T][S]|cameralx15|simd	11.6	4.5	9.2	434.5	28.8
19	int4|none|[T][S][L]Cache|cameralx15|simd	11.6	1.5	5.4	584.1	36.3
20	uint64|none|[T][S][L]Cache|cameralx15|simd	11.2	4.2	7.9	375.1	37.9

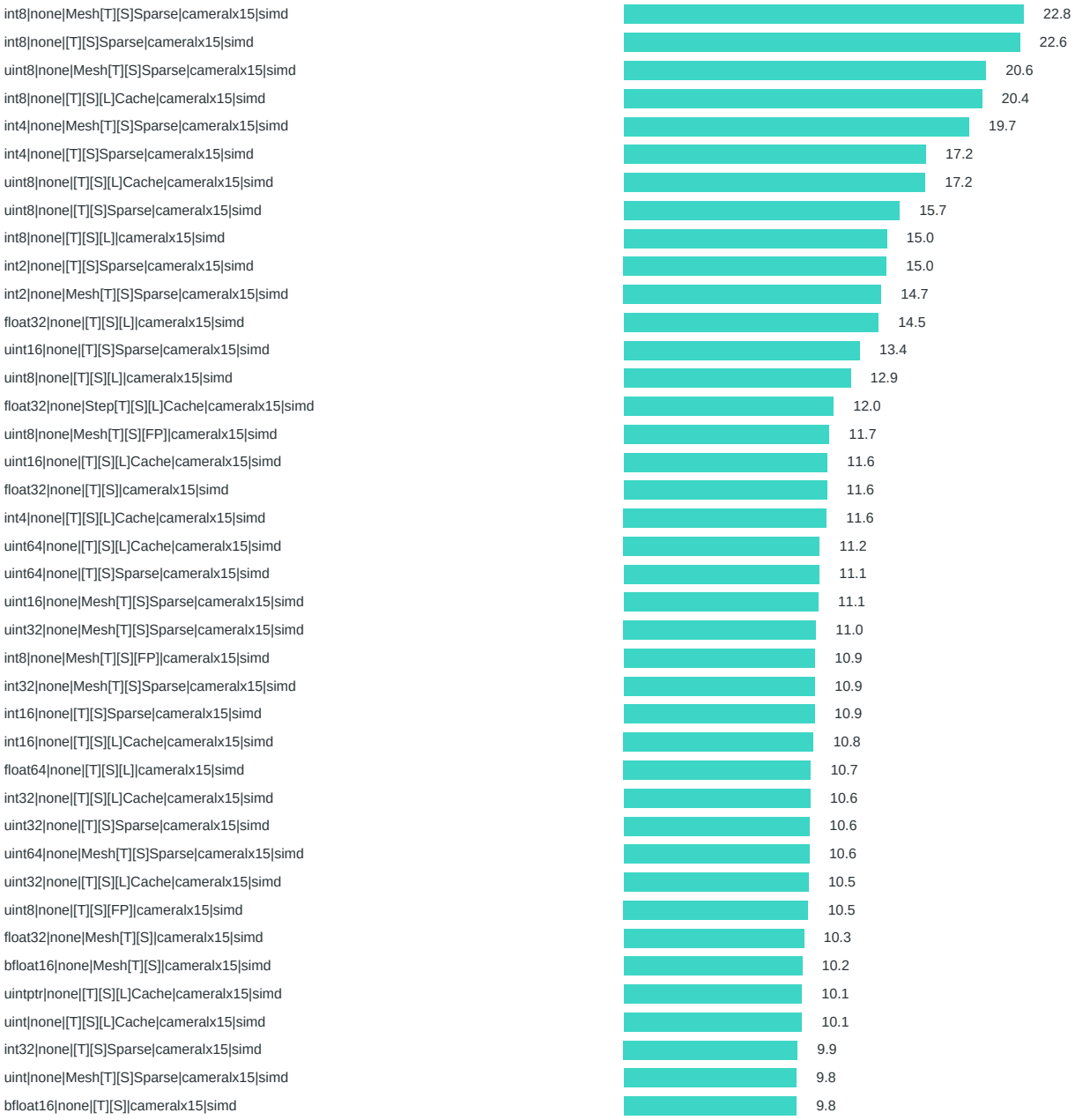
Leaderboard (SoftAcc)

#	Cell	Score	Soft	Acc	Thru	Avail
1	float32|none|[T][S][L]|cameralx15|simd	14.5	5.1	5.8	663.7	37.5
2	float64|none|[T][S][L]|cameralx15|simd	10.7	5.1	6.0	475.5	37.5
3	int8|none|[T][S][L]|cameralx15|simd	15.0	4.7	7.4	580.9	34.7
4	float32|none|Mesh[T][S]|cameralx15|simd	10.3	4.7	8.1	441.0	28.7
5	float32|none|[T][S]|cameralx15|simd	11.6	4.5	9.2	434.5	28.8
6	uint32|none|[T][S][L]Cache|cameralx15|simd	10.5	4.4	7.4	375.7	38.0
7	int32|none|[T][S][L]Cache|cameralx15|simd	10.6	4.4	7.7	362.6	38.1
8	uintptr|none|[T][S][L]Cache|cameralx15|simd	10.1	4.3	8.5	315.6	37.9
9	uint16|none|[T][S][L]Cache|cameralx15|simd	11.6	4.3	8.1	375.2	38.0
10	uint8|none|[T][S][L]|cameralx15|simd	12.9	4.3	7.3	508.8	34.8
11	int16|none|[T][S][L]Cache|cameralx15|simd	10.8	4.3	8.0	357.1	38.0
12	uint|none|[T][S][L]Cache|cameralx15|simd	10.1	4.3	8.6	312.6	37.8
13	int8|none|[T][S][L]Cache|cameralx15|simd	20.4	4.2	8.3	657.4	37.5
14	uint64|none|[T][S][L]Cache|cameralx15|simd	11.2	4.2	7.9	375.1	37.9
15	bfloat16|none|Mesh[T][S]|cameralx15|simd	10.2	4.1	11.3	307.2	29.3
16	uint8|none|[T][S][L]Cache|cameralx15|simd	17.2	4.0	8.0	568.9	37.6
17	bfloat16|none|[T][S]|cameralx15|simd	9.8	3.9	11.2	303.9	29.0
18	uint8|none|Mesh[T][S][FP]|cameralx15|simd	11.7	3.4	11.1	370.7	28.5
19	uint8|none|[T][S][FP]|cameralx15|simd	10.5	3.3	9.7	376.2	28.6
20	uint8|none|Mesh[T][S]Sparse|cameralx15|simd	20.6	3.2	9.0	596.3	38.7

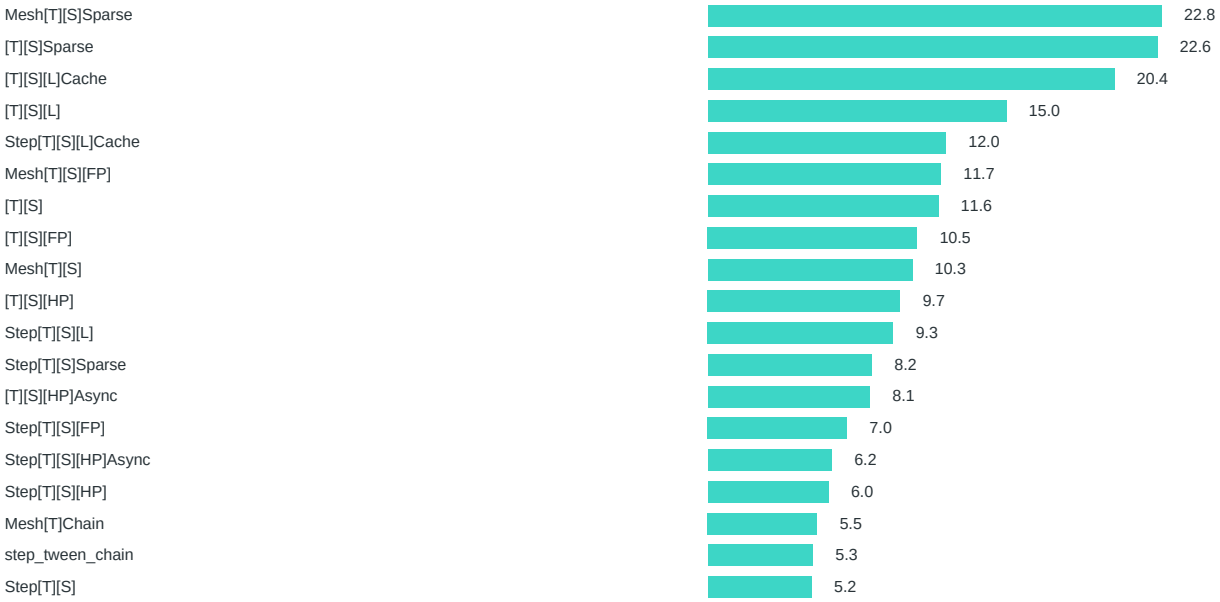
Leaderboard (hard Acc)

#	Cell	Score	Soft	Acc	Thru	Avail
1	bfloat16|none|Mesh[T][S]|cameralx15|simd	10.2	4.1	11.3	307.2	29.3
2	bfloat16|none|[T][S]|cameralx15|simd	9.8	3.9	11.2	303.9	29.0
3	uint8|none|Mesh[T][S][FP]|cameralx15|simd	11.7	3.4	11.1	370.7	28.5
4	uint8|none|[T][S][FP]|cameralx15|simd	10.5	3.3	9.7	376.2	28.6
5	int8|none|Mesh[T][S][FP]|cameralx15|simd	10.9	2.9	9.5	410.3	27.8
6	float32|none|[T][S]|cameralx15|simd	11.6	4.5	9.2	434.5	28.8
7	uint8|none|Mesh[T][S]Sparse|cameralx15|simd	20.6	3.2	9.0	596.3	38.7
8	uint16|none|[T][S]Sparse|cameralx15|simd	13.4	2.7	9.0	387.6	38.7
9	uint|none|[T][S][L]Cache|cameralx15|simd	10.1	4.3	8.6	312.6	37.8
10	uintptr|none|[T][S][L]Cache|cameralx15|simd	10.1	4.3	8.5	315.6	37.9
11	int8|none|Mesh[T][S]Sparse|cameralx15|simd	22.8	2.8	8.5	694.5	38.8
12	int8|none|[T][S]Sparse|cameralx15|simd	22.6	2.9	8.3	701.8	38.7
13	int8|none|[T][S][L]Cache|cameralx15|simd	20.4	4.2	8.3	657.4	37.5
14	uint16|none|[T][S][L]Cache|cameralx15|simd	11.6	4.3	8.1	375.2	38.0
15	float32|none|Mesh[T][S]|cameralx15|simd	10.3	4.7	8.1	441.0	28.7
16	int4|none|Mesh[T][S]Sparse|cameralx15|simd	19.7	2.2	8.0	638.0	38.4
17	uint8|none|[T][S][L]Cache|cameralx15|simd	17.2	4.0	8.0	568.9	37.6
18	int16|none|[T][S][L]Cache|cameralx15|simd	10.8	4.3	8.0	357.1	38.0
19	uint|none|Mesh[T][S]Sparse|cameralx15|simd	9.8	2.4	7.9	325.0	38.5
20	uint64|none|[T][S][L]Cache|cameralx15|simd	11.2	4.2	7.9	375.1	37.9

Top scores



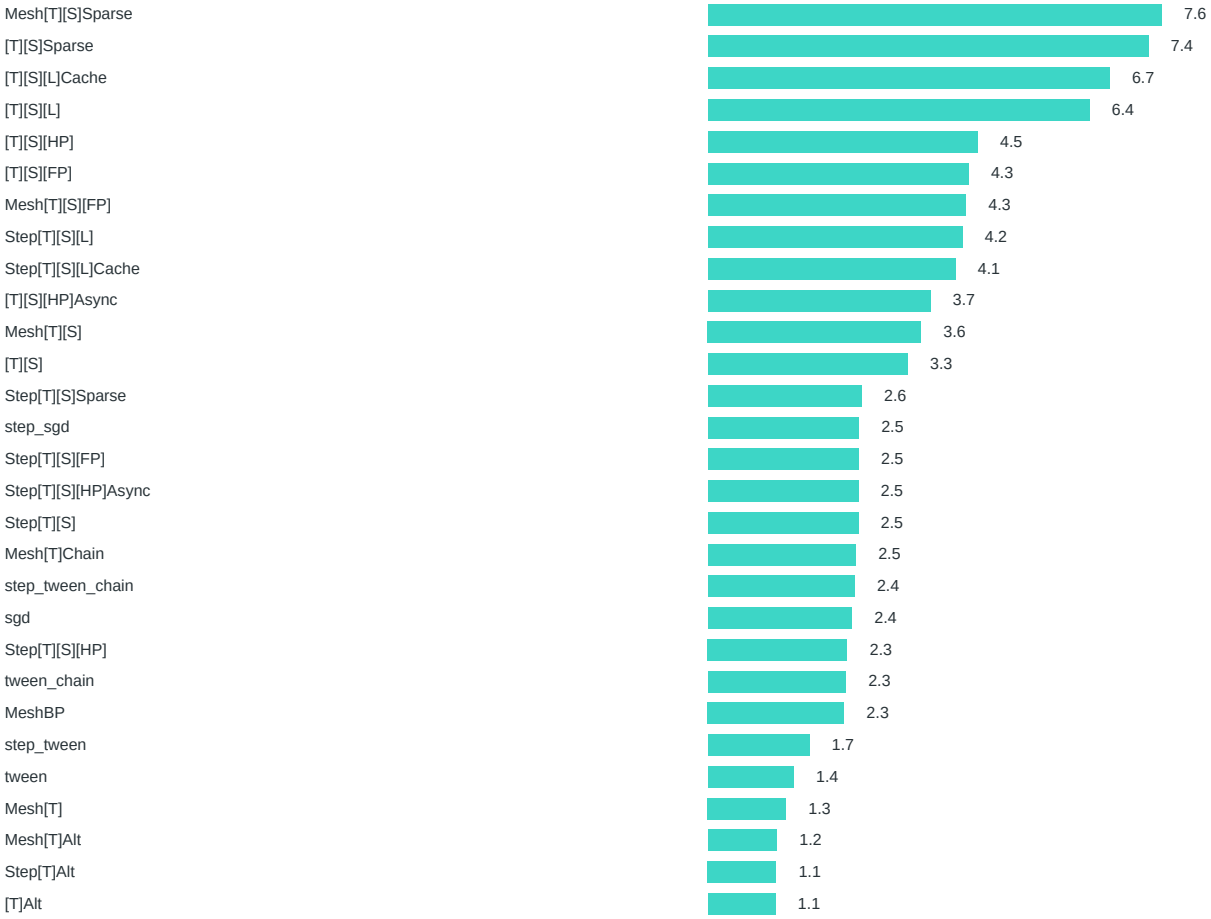
Best settings per mode



Best settings per mode



Mean Score by train mode



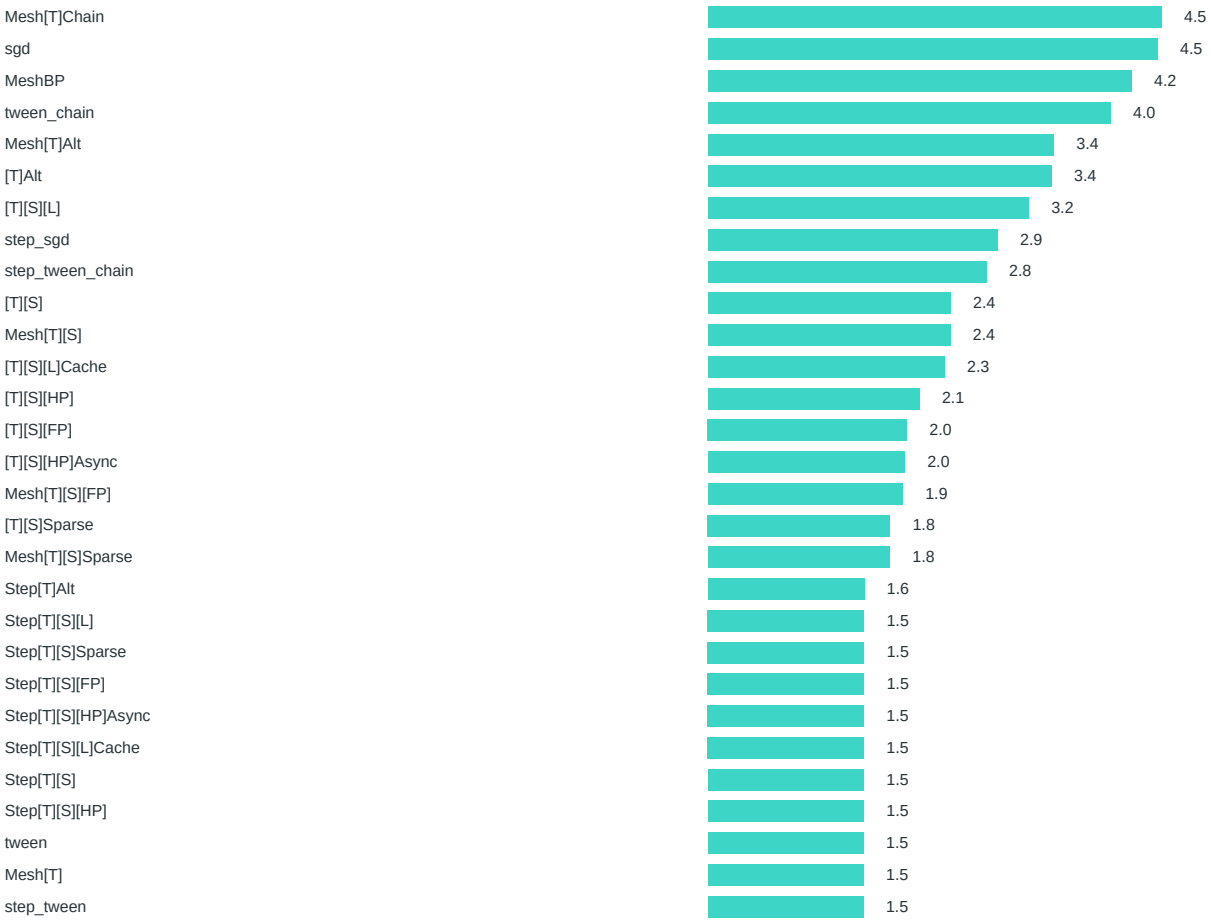
Mean hard Acc by train mode



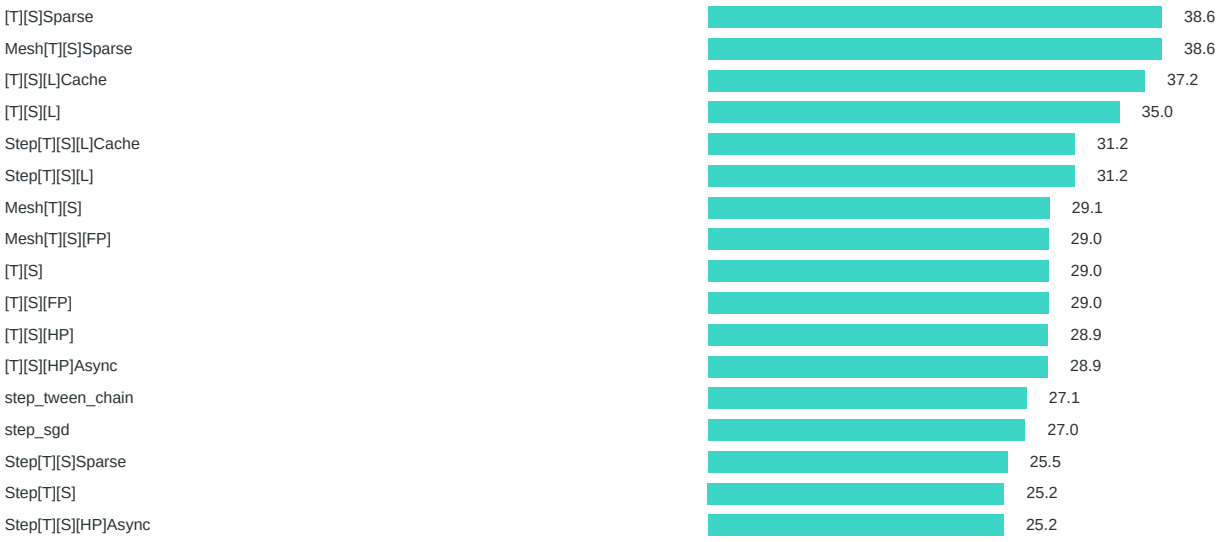
Mean hard Acc by train mode



Mean SoftAcc by train mode



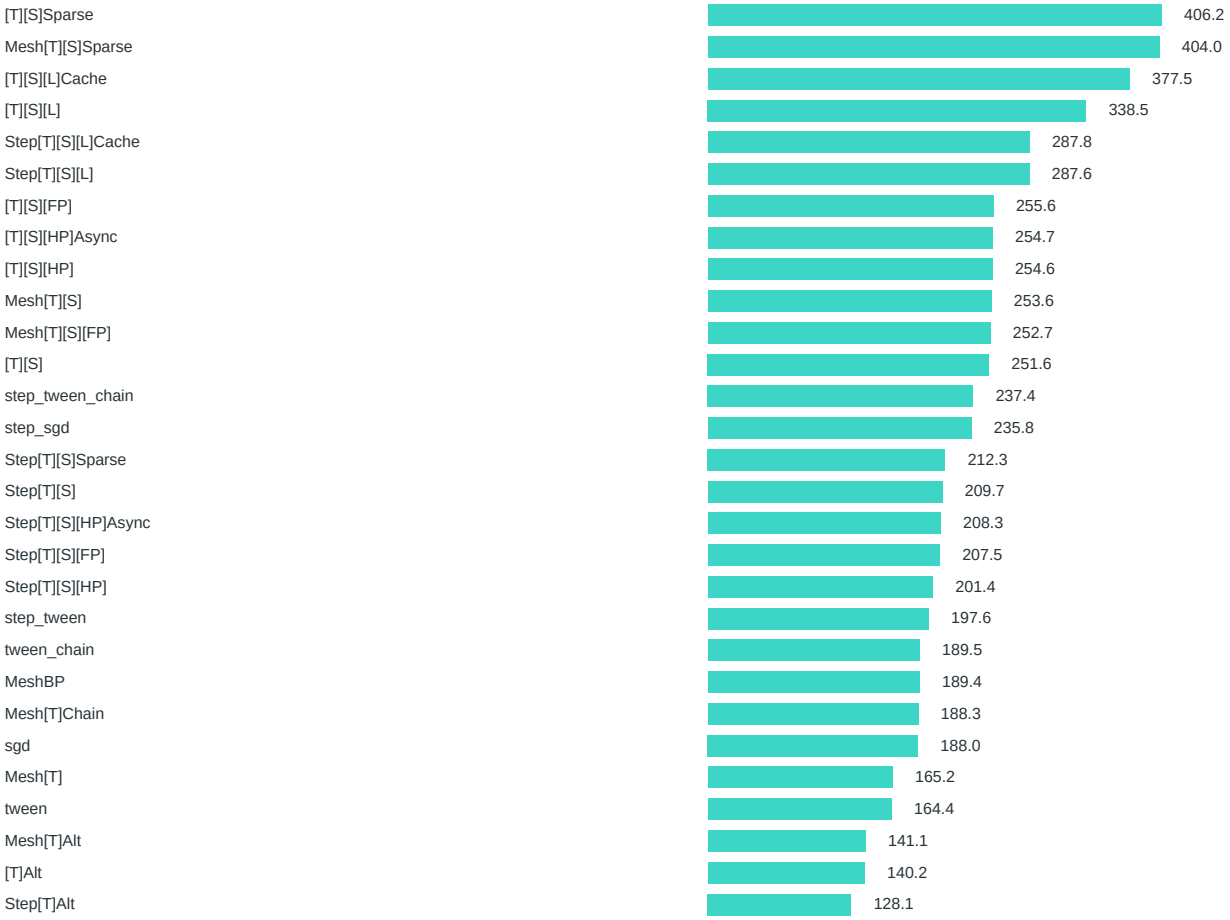
Mean Availability by train mode



Mean Availability by train mode



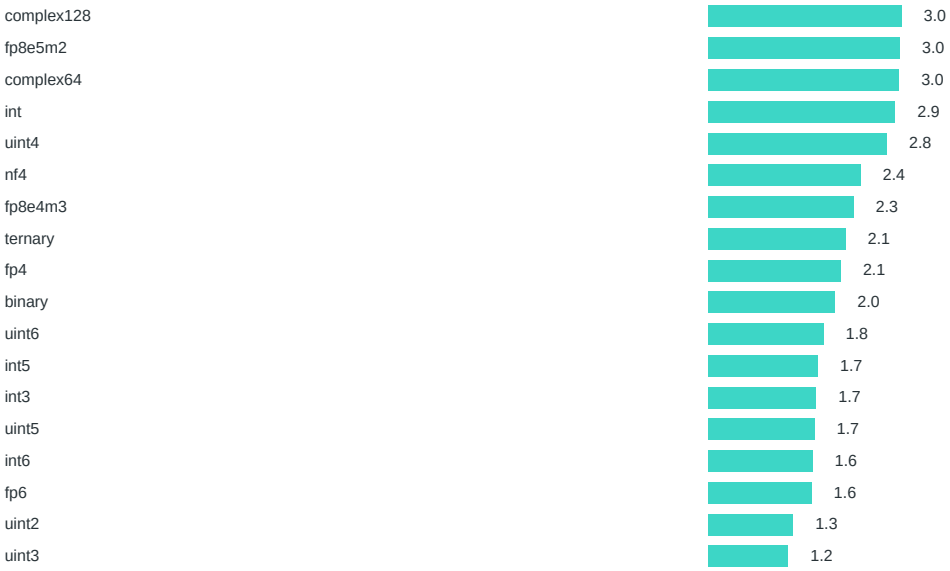
Mean Throughput by train mode



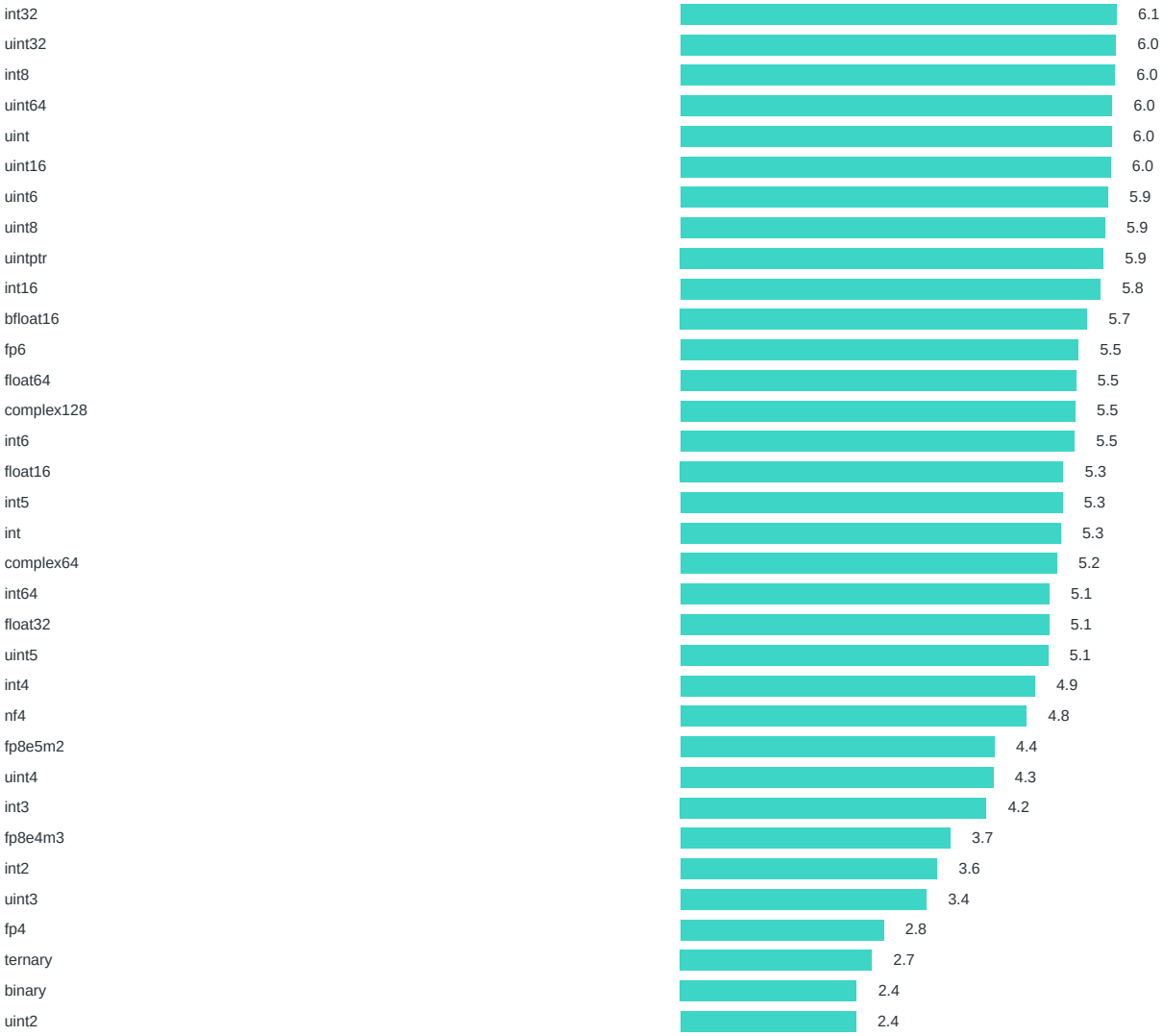
Mean Score by dtype



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	3	4	2	2	2	4	3	1	2	2	2	2
Mesh[T]	3	1	2	2	2	3	3	1	1	1	1	1
Mesh[T]Alt	2	0	1	1	2	3	2	1	1	1	1	1
Mesh[T]Chain	3	4	2	2	3	5	3	1	1	2	2	2
Mesh[T][S]	10	0	5	5	10	10	9	2	1	4	4	6
Mesh[T][S][FP]	3	2	2	4	4	5	5	2	2	3	3	2
Mesh[T][S]Sparse	6	4	3	4	7	9	6	5	5	4	4	4
Step[T]Alt	2	0	2	2	2	3	3	1	1	1	1	1
Step[T][S]	4	1	3	3	5	5	5	2	1	1	4	3
Step[T][S][FP]	6	1	4	3	5	7	5	1	1	1	4	3
Step[T][S][HP]	4	1	3	3	5	6	5	1	1	2	2	3
Step[T][S][HP]Async	4	1	4	3	6	6	5	2	1	2	2	3
Step[T][S][L]	7	3	6	5	8	9	9	2	2	2	6	6
Step[T][S][L]Cache	7	2	6	5	9	12	8	3	1	2	5	6
Step[T][S]Sparse	5	1	4	3	5	8	6	2	1	1	2	4
[T]Alt	2	0	1	1	2	2	2	1	1	1	1	1
[T][S]	10	2	5	6	8	12	8	2	1	4	4	6
[T][S][FP]	4	1	2	3	4	6	4	2	4	3	3	3
[T][S][HP]	4	1	4	3	4	5	5	2	4	4	3	2
[T][S][HP]Async	3	2	3	2	3	4	3	2	2	4	2	2
[T][S][L]	9	2	6	7	9	15	11	4	3	2	8	5
[T][S][L]Cache	6	3	4	4	6	8	7	4	2	3	7	4
[T][S]Sparse	5	4	4	4	7	9	6	5	4	6	4	4
sgd	3	3	2	2	3	4	3	1	1	2	2	2
step_sgd	2	4	2	2	2	4	2	2	1	2	2	1
step_tween	3	1	2	2	3	4	3	1	1	1	1	2
step_tween_chain	2	3	1	1	2	3	3	2	1	2	2	2
tween	3	0	2	2	3	4	3	1	0	1	1	2
tween_chain	3	4	1	1	3	4	3	2	1	2	2	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	4	2	2	4	2	2	2	4	2	4	2
Mesh[T]	1	1	0	2	1	1	1	2	2	1	1	2
Mesh[T]Alt	1	1	1	1	1	1	1	1	2	1	0	1
Mesh[T]Chain	2	5	2	2	3	2	1	2	5	2	3	1
Mesh[T][S]	3	0	1	4	1	1	1	6	7	1	4	4
Mesh[T][S][FP]	7	1	5	8	8	3	3	3	11	5	1	6
Mesh[T][S]Sparse	6	15	6	11	20	5	5	5	23	8	3	10
Step[T]Alt	1	0	0	1	1	0	0	2	2	1	0	1
Step[T][S]	3	1	0	3	3	1	1	4	5	2	1	2
Step[T][S][FP]	3	1	1	3	3	1	1	3	4	1	1	2
Step[T][S][HP]	3	1	1	3	2	1	1	4	4	1	1	2
Step[T][S][HP]Async	3	1	1	3	3	1	1	4	4	2	1	2
Step[T][S][L]	4	2	1	4	5	2	1	8	8	2	2	3
Step[T][S][L]Cache	4	3	1	6	5	2	2	5	6	3	2	4
Step[T][S]Sparse	3	1	1	3	3	1	1	3	4	2	1	2
[T]Alt	1	1	1	1	1	1	1	1	2	1	0	1
[T][S]	3	1	0	3	1	1	1	6	3	1	1	3
[T][S][FP]	7	7	4	7	3	2	2	2	10	5	2	7
[T][S][HP]	7	4	3	7	8	3	2	3	8	4	3	6
[T][S][HP]Async	6	3	3	6	8	3	2	2	8	4	2	4
[T][S][L]	9	5	2	9	6	2	4	7	15	4	4	7
[T][S][L]Cache	11	4	3	11	12	4	4	4	20	3	4	10
[T][S]Sparse	11	15	4	10	17	5	3	4	23	4	4	9
sgd	3	4	2	2	4	2	1	2	5	2	4	2
step_sgd	2	4	2	2	4	2	2	2	4	2	3	3
step_tween	2	1	0	2	1	1	1	3	4	1	1	2
step_tween_chain	3	4	2	3	4	1	2	2	4	2	3	2
tween	2	1	0	1	1	0	1	2	3	1	1	2
tween_chain	1	4	2	2	4	1	1	1	5	2	4	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	3	2	2	1	1	1	2	2	1
Mesh[T]	2	0	0	2	1	1	1	1	2	2
Mesh[T]Alt	1	0	1	2	1	1	1	1	2	1
Mesh[T]Chain	2	3	1	2	3	1	1	2	5	2
Mesh[T][S]	4	1	1	3	1	1	1	4	3	3
Mesh[T][S][FP]	7	1	1	5	2	3	2	7	12	6
Mesh[T][S]Sparse	11	2	3	11	4	5	5	11	21	9
Step[T]Alt	1	0	0	2	1	0	0	1	2	1
Step[T][S]	3	1	1	4	2	1	1	3	4	3
Step[T][S][FP]	3	1	0	4	2	1	1	3	3	3
Step[T][S][HP]	3	1	0	2	2	1	1	2	4	2
Step[T][S][HP]Async	3	1	1	3	2	1	1	2	4	3
Step[T][S][L]	4	1	1	5	3	2	2	5	8	4
Step[T][S][L]Cache	4	1	1	6	4	2	2	4	5	3
Step[T][S]Sparse	3	1	0	3	2	1	1	3	4	2
[T]Alt	1	0	1	1	1	1	1	1	2	1
[T][S]	4	0	1	4	1	1	0	3	4	3
[T][S][FP]	7	1	4	7	2	3	4	8	11	6
[T][S][HP]	8	1	1	8	6	3	4	8	10	6
[T][S][HP]Async	5	1	2	5	7	3	3	5	7	3
[T][S][L]	8	2	2	9	6	2	3	9	13	7
[T][S][L]Cache	12	2	2	11	8	2	5	11	17	10
[T][S]Sparse	13	2	2	11	6	5	5	11	16	9
sgd	2	2	1	2	3	1	1	2	4	1
step_sgd	3	3	2	3	3	1	2	3	3	3
step_tween	2	1	0	3	1	1	1	2	3	2
step_tween_chain	2	4	1	2	4	2	2	2	5	2
tween	1	0	0	2	1	1	1	2	2	2
tween_chain	2	3	2	2	2	2	1	2	4	1

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

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

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

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

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	3	5	5	4	4	5	5	5	4	4	4	4
Mesh[T]	2	2	2	2	2	2	2	2	2	2	2	2
Mesh[T]Alt	6	4	4	5	4	5	5	0	5	5	2	6
Mesh[T]Chain	4	5	5	4	4	5	5	5	4	5	4	4
Mesh[T][S]	2	2	2	2	2	2	2	4	2	2	2	2
Mesh[T][S][FP]	4	2	2	3	2	2	2	2	3	2	2	3
Mesh[T][S]Sparse	2	2	2	3	2	2	2	2	3	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	5	4	4	6	4	5	5	0	5	4	2	5
[T][S]	2	2	2	2	2	2	2	4	2	2	2	2
[T][S][FP]	4	2	2	3	2	2	2	2	3	2	2	4
[T][S][HP]	4	2	2	4	2	2	2	2	2	2	2	4
[T][S][HP]Async	4	2	2	4	2	2	4	2	4	2	2	2
[T][S][L]	5	2	2	5	2	2	2	5	5	2	2	5
[T][S][L]Cache	4	2	2	4	2	2	2	2	4	2	2	4
[T][S]Sparse	2	2	2	2	2	2	2	2	3	2	2	3
sgd	4	5	5	4	5	5	4	5	4	4	4	4
step_sgd	3	4	4	4	4	4	4	2	4	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	3	4	3	4
tween	2	2	2	2	2	2	2	2	2	2	2	2
tween_chain	3	5	4	4	5	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	5	4	4	3	3	4	4	2	3
Mesh[T]	2	2	2	2	2	2	2	2	2	2
Mesh[T]Alt	5	2	4	6	4	5	5	5	6	6
Mesh[T]Chain	3	4	4	4	4	4	4	4	5	4
Mesh[T][S]	2	2	2	2	2	2	2	2	2	2
Mesh[T][S][FP]	3	2	2	2	2	2	2	3	3	3
Mesh[T][S]Sparse	2	2	2	2	2	2	2	2	3	3
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	5	2	5	5	4	5	5	5	5	6
[T][S]	2	2	2	2	2	2	2	2	2	2
[T][S][FP]	4	2	2	3	2	2	2	3	3	3
[T][S][HP]	4	2	2	4	2	2	3	4	3	3
[T][S][HP]Async	4	2	2	4	2	2	4	2	4	3
[T][S][L]	5	2	2	4	2	2	2	5	4	4
[T][S][L]Cache	4	2	2	4	2	2	2	4	4	4
[T][S]Sparse	3	2	2	2	2	2	2	2	2	2
sgd	4	4	3	4	4	4	4	4	4	4
step_sgd	4	4	4	4	4	4	4	4	3	4
step_tween	2	2	2	2	2	2	2	2	2	2
step_tween_chain	4	4	3	3	4	4	4	3	4	4
tween	2	2	2	2	2	2	2	2	2	2
tween_chain	4	4	5	4	4	4	4	4	4	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	24	21	24	24	22	24	24	23	24	24	24	24
Mesh[T]	22	18	22	22	20	22	22	21	21	22	22	22
Mesh[T]Alt	24	13	24	24	24	24	24	15	16	17	24	24
Mesh[T]Chain	24	21	24	24	22	24	24	23	24	24	24	24
Mesh[T][S]	29	26	30	30	28	29	30	28	30	30	29	30
Mesh[T][S][FP]	29	26	30	30	27	29	29	28	30	30	30	30
Mesh[T][S]Sparse	39	38	39	39	39	39	39	39	39	39	39	39
Step[T]Alt	18	14	18	18	16	18	18	17	18	18	18	18
Step[T][S]	26	23	26	26	24	25	26	24	26	26	26	26
Step[T][S][FP]	26	23	26	26	24	25	26	24	26	26	25	26
Step[T][S][HP]	25	22	25	25	24	25	25	24	25	25	25	25
Step[T][S][HP]Async	25	23	26	26	24	25	26	24	26	26	26	26
Step[T][S][L]	32	31	32	32	31	32	32	31	31	31	31	32
Step[T][S][L]Cache	32	31	32	32	32	32	32	30	31	31	31	32
Step[T][S]Sparse	26	23	26	26	24	25	26	25	26	27	26	26
[T]Alt	24	13	24	24	24	24	24	15	16	17	24	24
[T][S]	29	26	30	30	28	29	30	28	30	30	29	30
[T][S][FP]	29	26	30	30	27	28	30	28	30	30	30	30
[T][S][HP]	29	26	30	30	27	28	29	28	30	30	30	30
[T][S][HP]Async	29	26	30	30	27	28	29	28	30	30	30	30
[T][S][L]	36	31	36	36	35	38	38	37	34	35	36	36
[T][S][L]Cache	37	37	37	37	35	38	38	37	37	38	38	37
[T][S]Sparse	39	38	39	39	39	39	39	39	39	39	39	39
sgd	23	21	24	24	22	24	24	22	24	24	24	24
step_sgd	27	24	28	28	25	27	28	26	28	28	28	28
step_tween	24	21	25	25	23	25	25	23	24	25	25	25
step_tween_chain	27	24	28	28	25	28	28	26	28	28	28	28
tween	21	18	22	22	20	21	22	21	21	22	22	22
tween_chain	24	21	24	24	22	24	24	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	21	24	24	21	24	24	24	23	24	20	24
Mesh[T]	22	19	21	22	19	21	21	22	21	21	18	22
Mesh[T]Alt	17	13	16	17	13	16	16	24	16	16	12	16
Mesh[T]Chain	24	20	24	24	21	24	24	24	23	24	20	24
Mesh[T][S]	30	25	30	30	26	30	30	30	28	29	26	30
Mesh[T][S][FP]	30	25	30	30	26	30	30	30	28	29	26	30
Mesh[T][S]Sparse	39	38	38	39	38	38	39	39	39	39	39	39
Step[T]Alt	18	14	18	18	14	18	18	18	17	17	13	18
Step[T][S]	26	22	26	26	23	26	26	26	24	25	23	26
Step[T][S][FP]	26	22	26	26	23	26	26	26	24	25	22	26
Step[T][S][HP]	25	22	25	25	22	25	25	25	24	25	21	25
Step[T][S][HP]Async	26	22	26	26	23	26	26	26	24	25	23	26
Step[T][S][L]	32	30	31	32	30	31	31	32	31	30	30	32
Step[T][S][L]Cache	32	30	31	32	30	31	31	32	31	30	30	32
Step[T][S]Sparse	26	23	26	26	24	26	26	26	25	26	23	26
[T]Alt	16	13	16	16	13	16	16	24	15	16	12	16
[T][S]	30	25	30	30	26	30	30	30	28	29	26	30
[T][S][FP]	30	25	30	30	26	30	30	30	28	29	26	30
[T][S][HP]	30	25	30	30	26	30	30	30	28	29	26	30
[T][S][HP]Async	30	25	30	29	26	30	30	30	28	29	26	30
[T][S][L]	36	33	35	36	31	34	34	37	35	34	30	36
[T][S][L]Cache	38	36	37	38	36	37	37	38	38	36	37	38
[T][S]Sparse	39	38	39	39	39	39	39	39	39	39	38	39
sgd	24	20	24	24	21	24	24	24	22	23	20	24
step_sgd	28	24	28	28	24	27	28	28	26	27	23	28
step_tween	25	21	25	25	21	25	24	25	24	24	20	24
step_tween_chain	28	24	28	28	24	28	28	28	27	27	23	28
tween	22	18	21	22	18	21	21	22	21	21	18	21
tween_chain	24	21	24	24	21	24	24	24	23	24	20	24

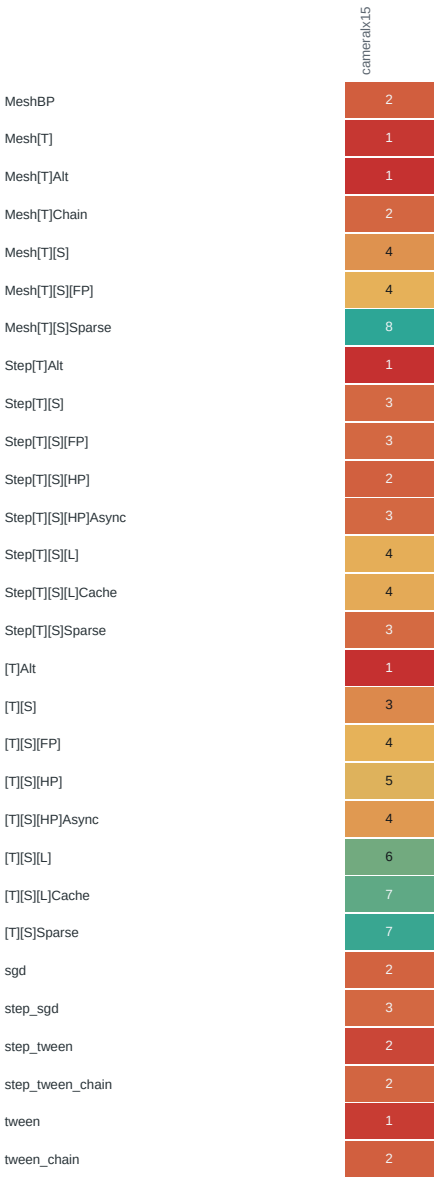
Honesty - mean Avail, every mode x dtype (cols 25-34)

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

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	24	24	24	24	24	24	24	24	24	24
Mesh[T]	21	21	21	22	22	21	21	21	22	21
Mesh[T]Alt	16	16	16	16	16	16	16	16	16	16
Mesh[T]Chain	24	24	24	24	24	24	24	24	24	24
Mesh[T][S]	30	29	30	30	29	30	30	30	29	30
Mesh[T][S][FP]	30	29	29	29	29	30	30	29	29	30
Mesh[T][S]Sparse	39	39	39	39	38	38	38	39	39	39
Step[T]Alt	18	18	17	18	18	18	18	18	17	18
Step[T][S]	26	26	26	25	26	26	26	26	25	26
Step[T][S][FP]	25	25	26	25	25	26	25	25	25	26
Step[T][S][HP]	25	25	25	25	25	25	25	25	25	25
Step[T][S][HP]Async	26	25	25	26	25	26	26	26	25	26
Step[T][S][L]	32	31	31	32	31	31	31	32	31	32
Step[T][S][L]Cache	32	31	31	32	31	31	31	32	31	32
Step[T][S]Sparse	26	26	26	26	26	26	26	26	25	26
[T]Alt	16	16	16	16	16	16	16	16	16	16
[T][S]	29	29	30	29	29	30	30	29	29	30
[T][S][FP]	29	29	30	30	29	30	30	30	29	30
[T][S][HP]	29	29	30	29	29	30	30	29	28	30
[T][S][HP]Async	29	29	30	29	29	30	30	29	29	30
[T][S][L]	36	35	35	36	36	34	34	36	35	36
[T][S][L]Cache	38	37	37	38	38	37	37	38	38	38
[T][S]Sparse	39	39	38	39	39	38	39	39	39	39
sgd	23	23	23	24	23	24	24	24	23	24
step_sgd	27	28	27	28	27	27	27	27	27	27
step_tween	25	24	24	25	24	24	24	25	24	25
step_tween_chain	27	27	27	28	27	27	28	28	27	28
tween	22	21	21	21	21	21	21	21	21	21
tween_chain	24	23	24	24	23	24	24	24	23	24

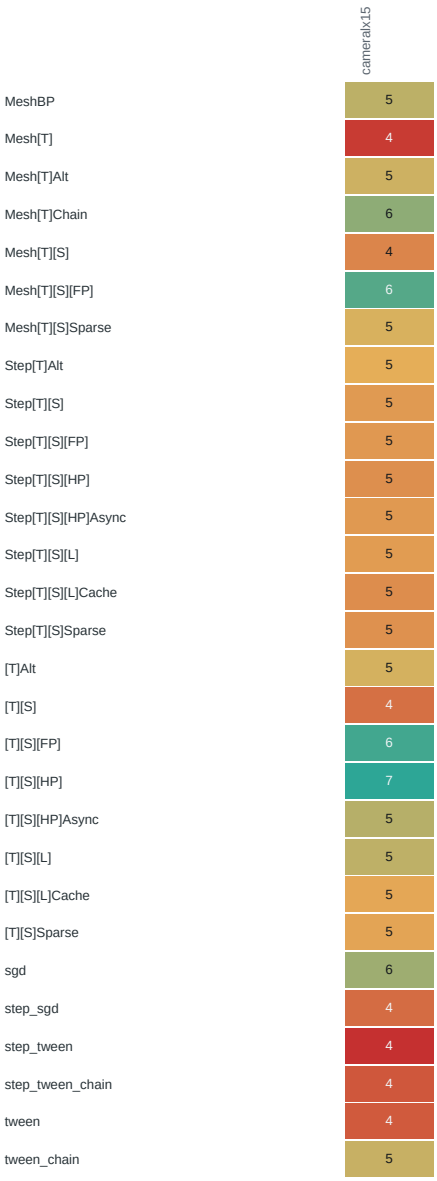
Mean Score, every mode x arch

Mean Score, every mode x arch



Mean hard Acc, every mode x arch

Mean hard Acc, every mode x arch

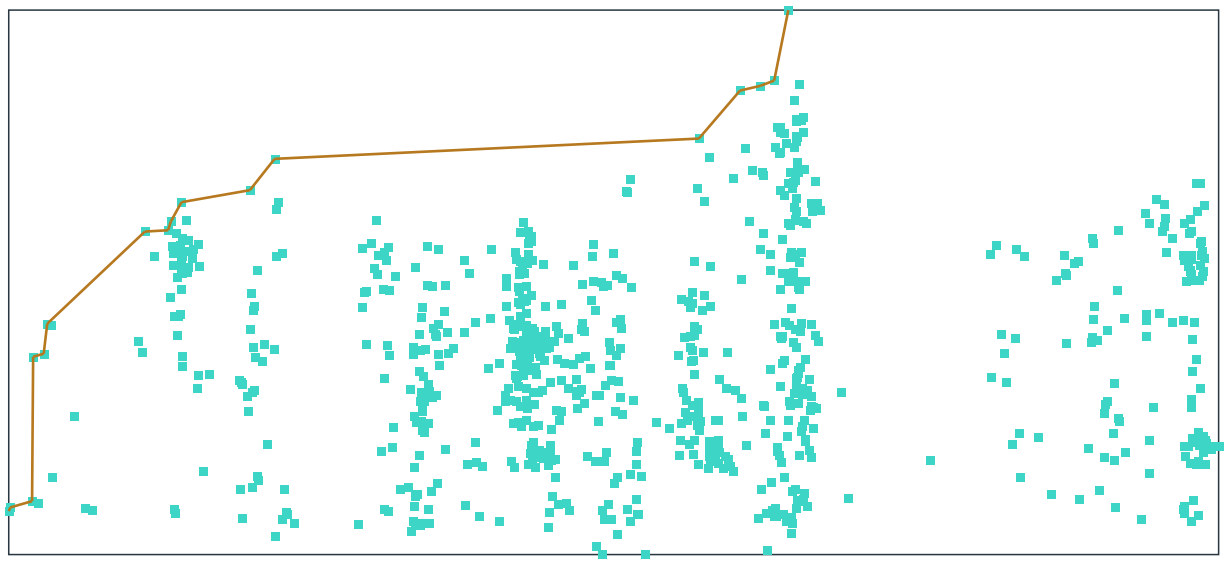


Mean Avail, every mode x arch

Mean Avail, every mode x arch

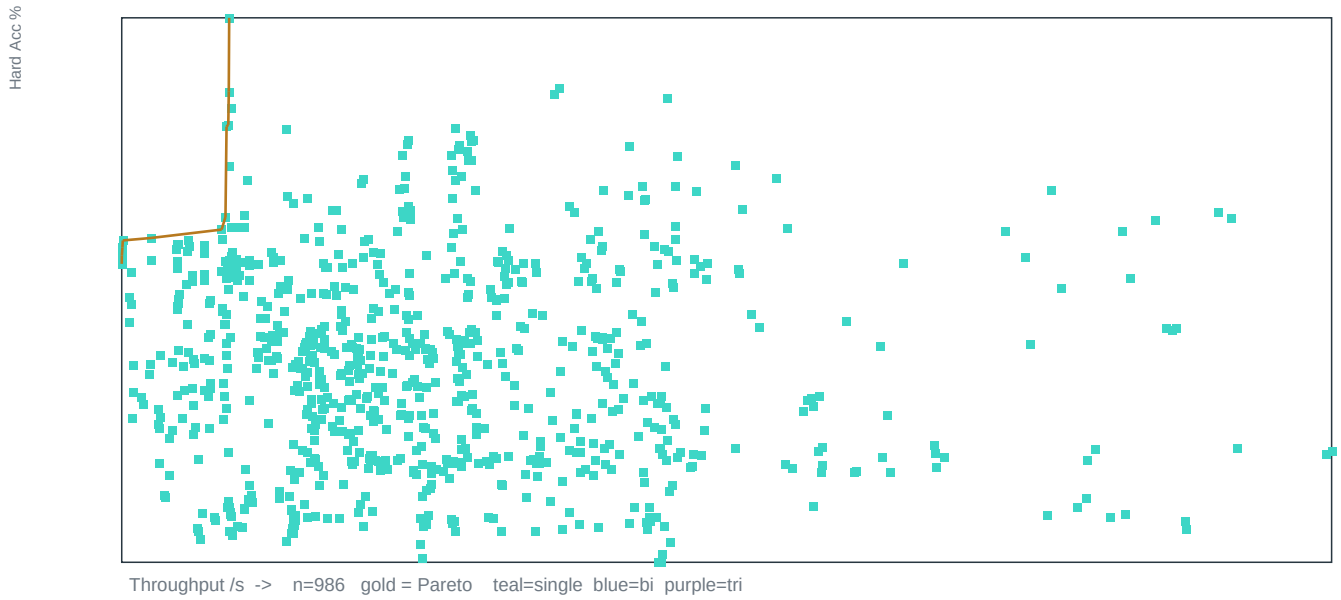
	cameralx15
MeshBP	23
Mesh[T]	21
Mesh[T]Alt	18
Mesh[T]Chain	23
Mesh[T][S]	29
Mesh[T][S][FP]	29
Mesh[T][S]Sparse	39
Step[T]Alt	17
Step[T][S]	25
Step[T][S][FP]	25
Step[T][S][HP]	25
Step[T][S][HP]Async	25
Step[T][S][L]	31
Step[T][S][L]Cache	31
Step[T][S]Sparse	25
[T]Alt	18
[T][S]	29
[T][S][FP]	29
[T][S][HP]	29
[T][S][HP]Async	29
[T][S][L]	35
[T][S][L]Cache	37
[T][S]Sparse	39
sgd	23
step_sgd	27
step_tween	24
step_tween_chain	27
tween	21
tween_chain	23

Pillars - Availability vs hard Acc

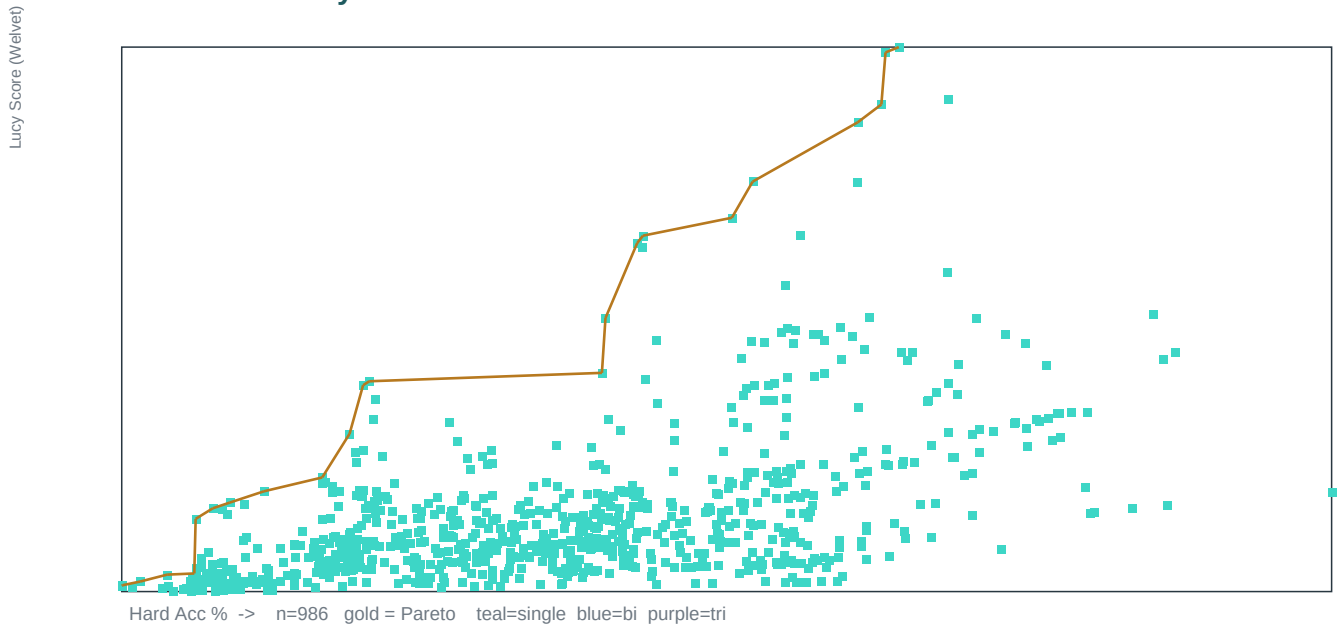



Availability % -> n=986 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

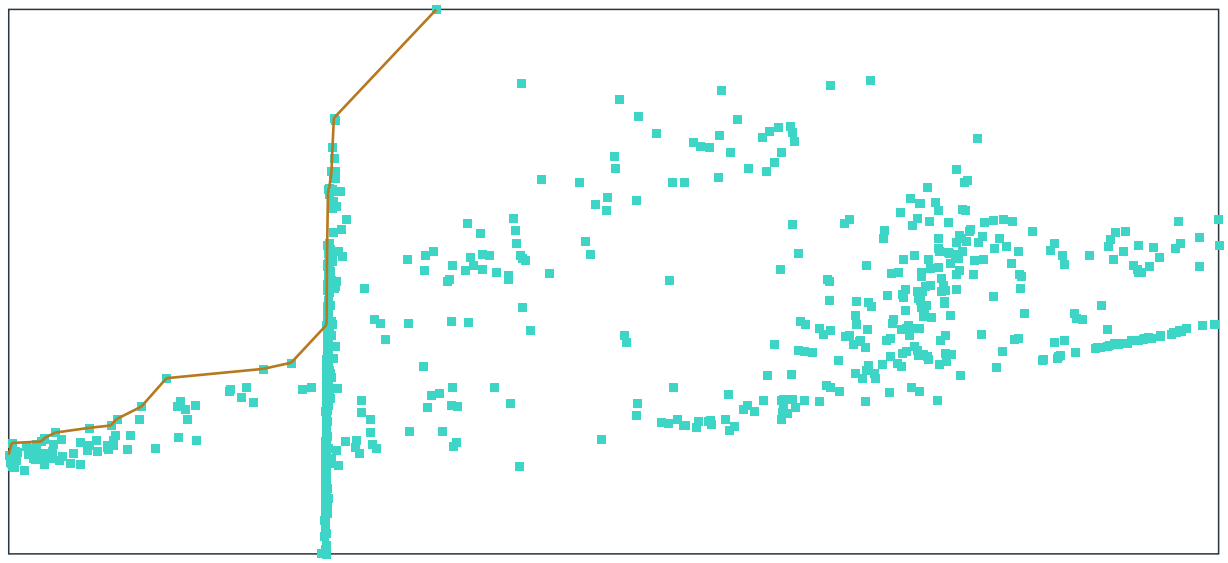
Pillars - Throughput vs hard Acc



Pareto - hard Acc vs Lucy Score

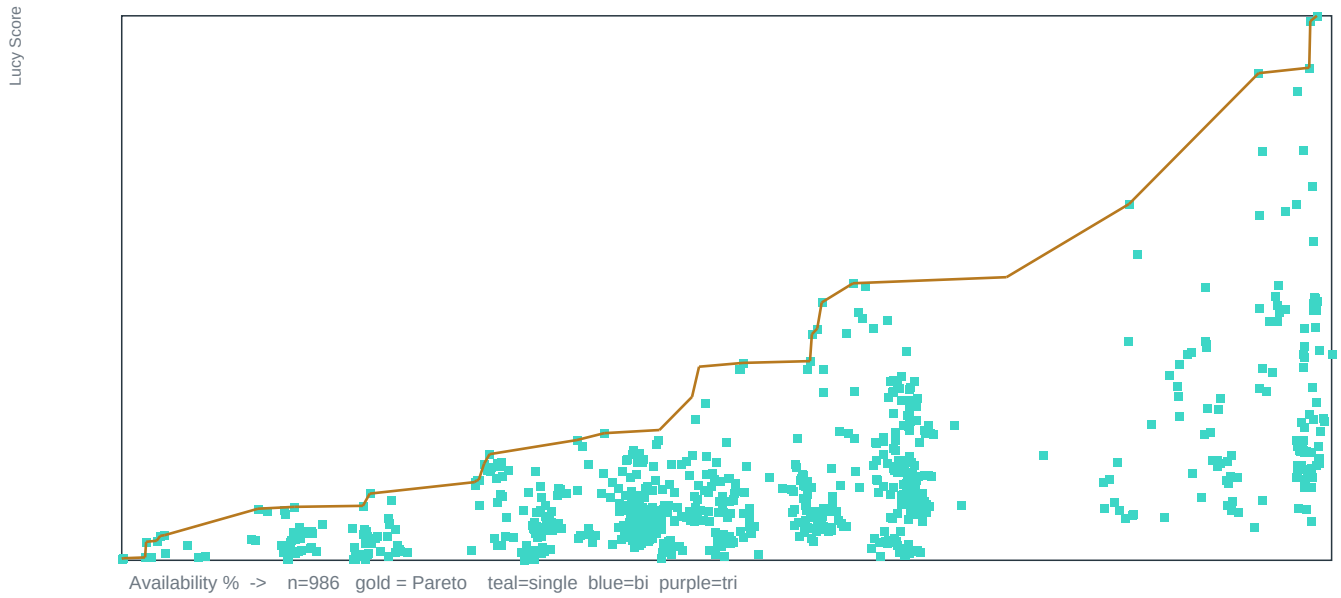


SoftAcc (serve-confidence) vs hard Acc

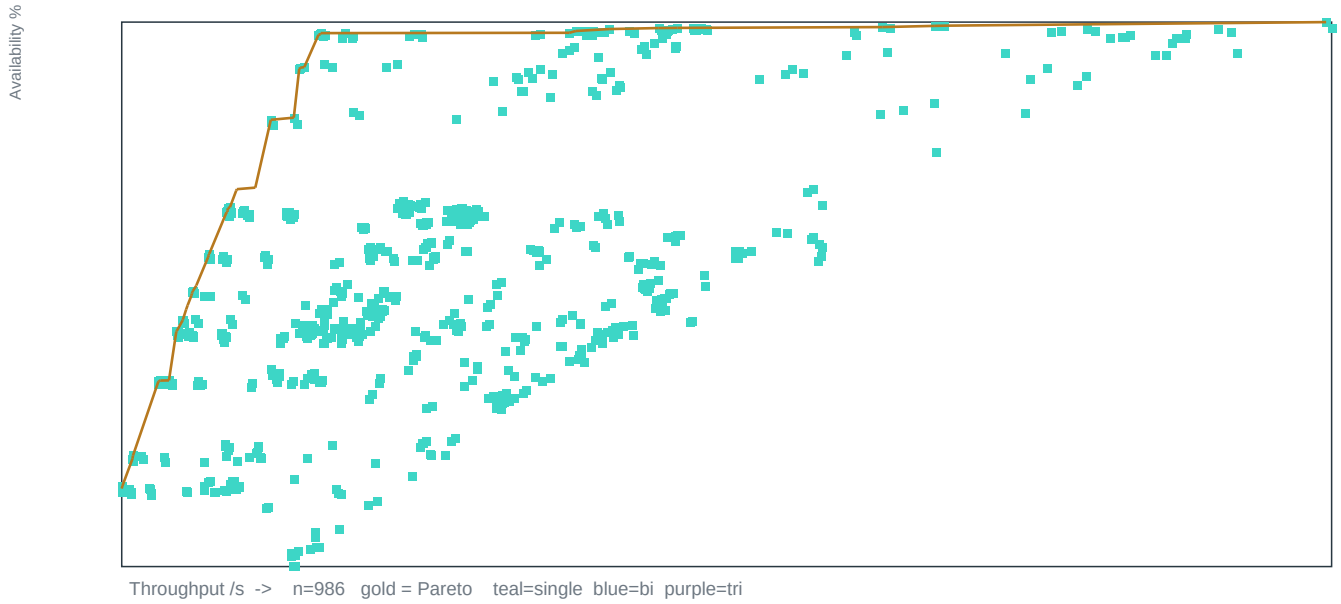



SoftAcc % -> n=986 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

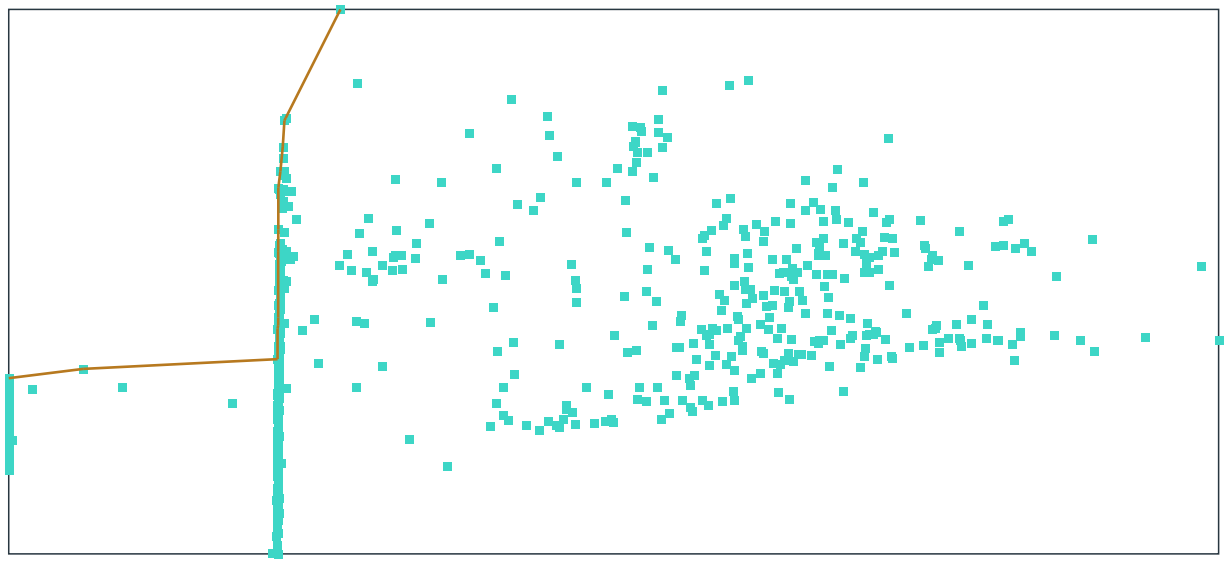
Avail vs Lucy Score (duty clock)



Pillars - Throughput vs Availability



AdaptPct vs hard Acc



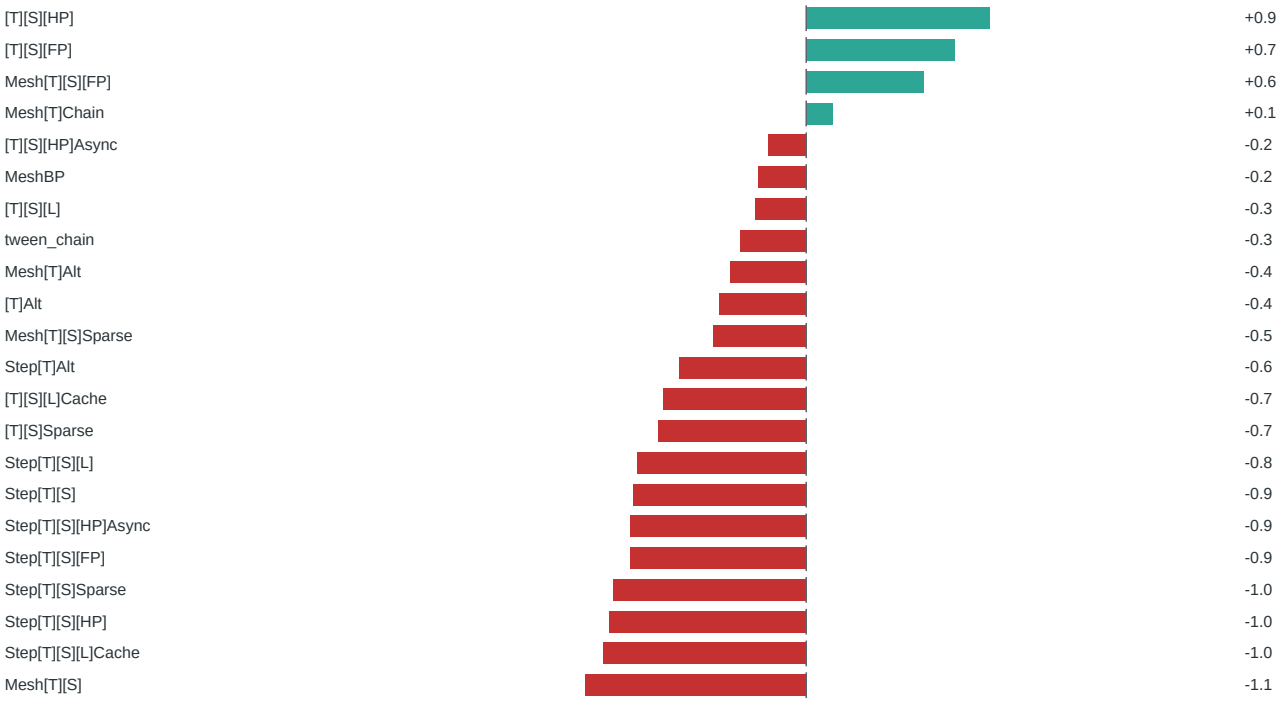

AdaptPct % -> n=986 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

vs sgd - matched dtype x format x arch

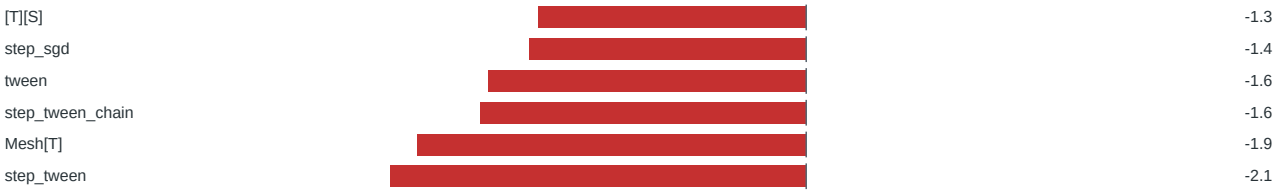
AccDelta is the honest column. ScoreDelta is usually Availability (duty clock), not a better chain rule. Acc win = AccDelta > 0.5. Score win = ScoreDelta > 1. Baseline is discovered from the board, not a frozen StepBP list.

mode	n	AccD	Acc win%	SoftD	AvailD	ThruD	ScoreD	Score win%
[T][S][HP]	34	+0.9	50	-2.4	+5.8	+67	+2.1	68
[T][S][FP]	34	+0.7	44	-2.5	+5.8	+68	+1.9	56
Mesh[T][S][FP]	34	+0.6	41	-2.5	+5.8	+65	+1.9	56
Mesh[T]Chain	34	+0.1	29	+0.0	+0.2	+0	+0.1	6
[T][S][HP]Async	34	-0.2	41	-2.5	+5.8	+67	+1.3	59
MeshBP	34	-0.2	21	-0.3	+0.2	+1	-0.1	3
[T][S][L]	34	-0.3	47	-1.3	+11.9	+150	+4.0	76
tween_chain	34	-0.3	21	-0.5	+0.1	+1	-0.1	3
Mesh[T]Alt	34	-0.4	38	-1.0	-5.3	-47	-1.3	0
[T]Alt	34	-0.4	41	-1.0	-5.4	-48	-1.3	0
Mesh[T][S]Sparse	34	-0.5	38	-2.7	+15.5	+216	+5.2	91
Step[T]Alt	34	-0.6	35	-2.9	-5.9	-60	-1.3	0
[T][S][L]Cache	34	-0.7	29	-2.1	+14.0	+189	+4.3	79
[T][S]Sparse	34	-0.7	32	-2.7	+15.5	+218	+5.0	94
Step[T][S][L]	34	-0.8	29	-2.9	+8.0	+100	+1.8	56
Step[T][S]	34	-0.9	32	-2.9	+2.0	+22	+0.1	26
Step[T][S][HP]Async	34	-0.9	29	-2.9	+2.0	+20	+0.1	26
Step[T][S][FP]	34	-0.9	35	-2.9	+1.9	+19	+0.1	29
Step[T][S]Sparse	34	-1.0	29	-2.9	+2.3	+24	+0.2	24
Step[T][S][HP]	34	-1.0	29	-2.9	+1.4	+13	-0.1	21
Step[T][S][L]Cache	34	-1.0	32	-2.9	+8.1	+100	+1.7	56
Mesh[T][S]	34	-1.1	35	-2.1	+5.9	+66	+1.2	50
[T][S]	34	-1.3	29	-2.1	+5.8	+64	+0.9	47
step_sgd	34	-1.4	15	-1.6	+3.8	+48	+0.1	15
tween	34	-1.6	26	-2.9	-2.2	-24	-1.0	0
step_tween_chain	34	-1.6	3	-1.7	+3.9	+49	+0.0	12
Mesh[T]	34	-1.9	12	-2.9	-2.0	-23	-1.1	0
step_tween	34	-2.1	15	-2.9	+0.9	+10	-0.7	0

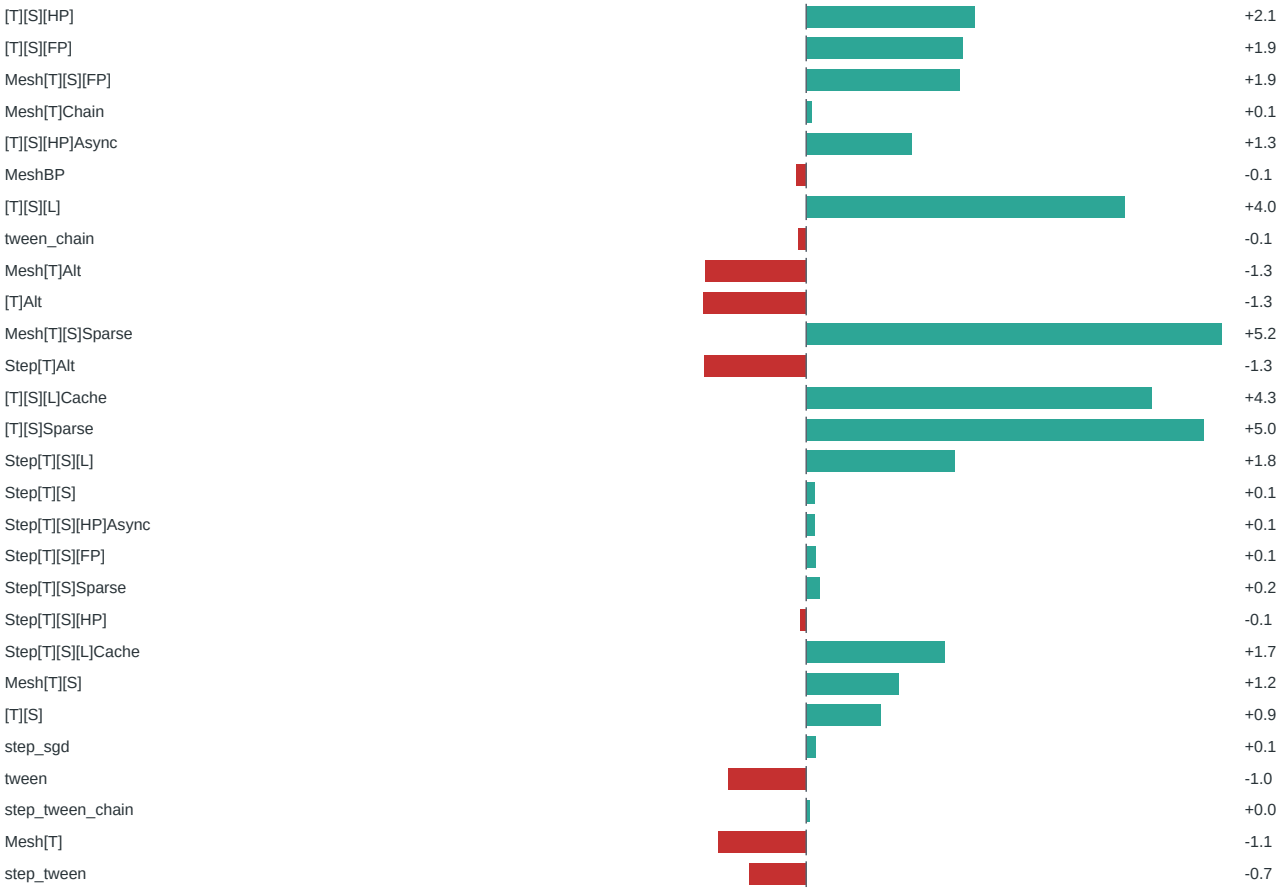
mean AccD vs sgd



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

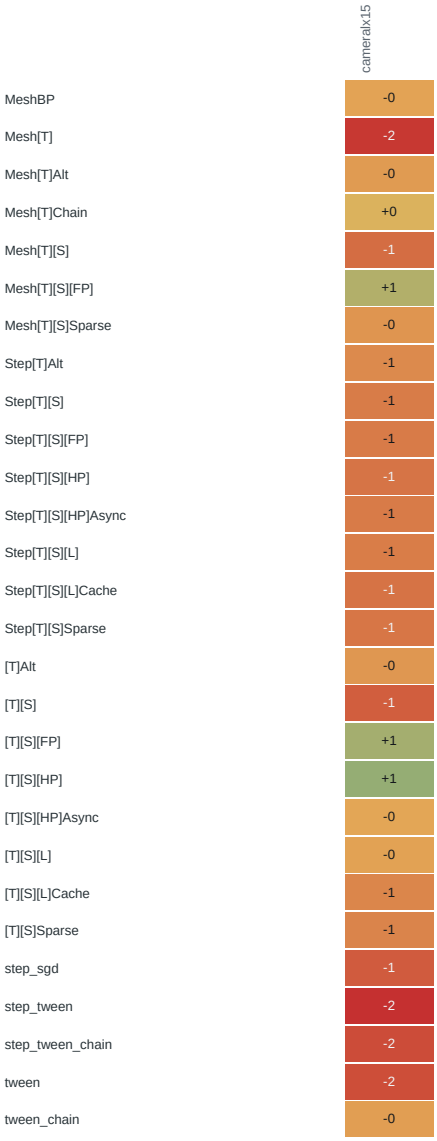
AvailD vs sgd, every mode x dtype (cols 25-34)

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

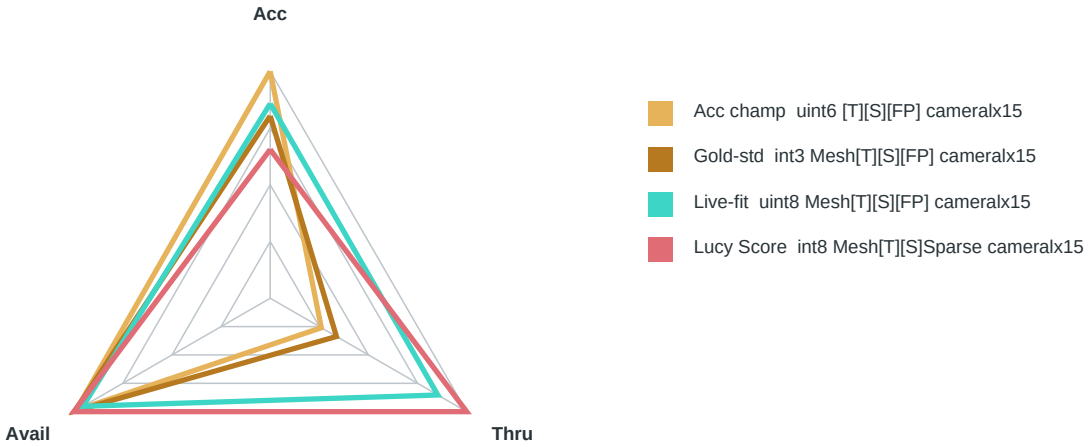
Step* is a 1D pipe (one sample enters layer 0 per tick; output is the sample that entered depth ticks ago). Non-Step of the same family is a full-chain update. AccD is a real scheduler split, not leftover warm-up forwards.

step	plain	n	mean |AccD|
Step[T]Alt	[T]Alt	34	2.94
Step[T][S]	[T][S]	34	1.85
Step[T][S][FP]	[T][S][FP]	34	3.52
Step[T][S][HP]	[T][S][HP]	34	3.23
Step[T][S][HP]Async	[T][S][HP]Async	34	2.72
Step[T][S][L]	[T][S][L]	34	1.52
Step[T][S][L]Cache	[T][S][L]Cache	34	2.16
Step[T][S]Sparse	[T][S]Sparse	34	2.54
step_sgd	sgd	34	1.81
step_tween	tween	34	1.00
step_tween_chain	tween_chain	34	1.66

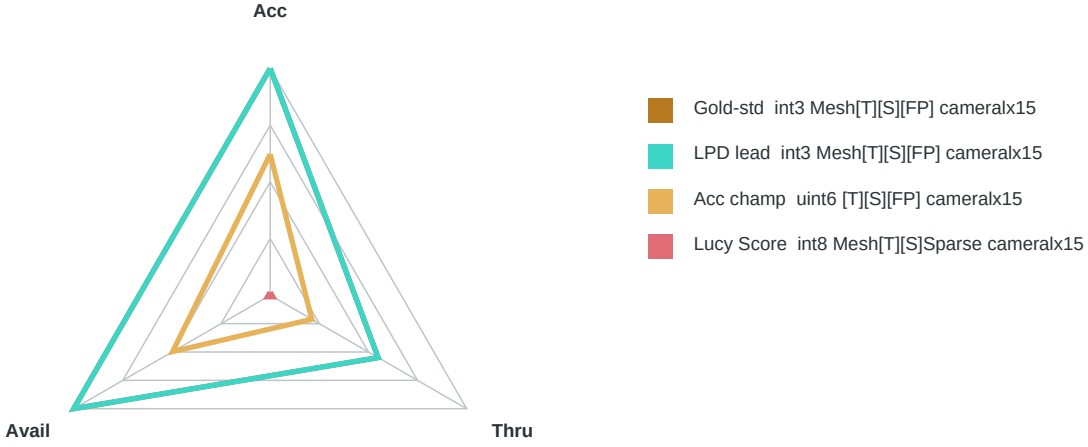
Consciousness - Acc, Throughput, Availability

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 uint6|none|[T][S][FP]|cameralx15|simd Acc 12.9 Thru 113 Avail 29.6% 100.7 KiB (RAM reference)
Lucy Score champ (T x Avail x Acc) int8|none|Mesh[T][S]Sparse|cameralx15|simd Score 22.8 Acc 8.5 Soft 3 134.1 KiB
Live-fit champ (best Q) uint8|none|Mesh[T][S][FP]|cameralx15|simd Acc 11.1 Thru 371 Avail 28.5% 134.2 KiB
Gold-std (2+ pillars, Acc keep >= 80%, then smallest then fastest): int3|none|Mesh[T][S][FP]|cameralx15|simd mode Mesh[T][S][FP] Acc 10.4 Thru 147 50.3 KiB
Board fastest float32|none|[T][S]Sparse|cameralx15|simd Thru 761 (traps may own this) Best availability float32|none|Mesh[T][S]Sparse|cameralx15|simd 39.1%
Learner Thru peak 434 learner Avail peak 30.0%

Consciousness radar - Acc / Thru / Avail vs learner peaks



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



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

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

Mode	n	Acc	KiB	Thru	Cell
Mesh[T][S][FP]	4	11.1	50.3	371	int3 Mesh[T][S][FP] cameralx15 / uint8 Mesh[T][S][FP] cameralx15
[T][S][HP]	2	11.2	100.6	114	fp6 [T][S][HP] cameralx15 / uint6 [T][S][HP] cameralx15

Mode	n	Acc	KiB	Thru	Cell
[T][S][FP]	2	12.9	100.6	113	fp6 [T][S][FP] cameralx15 / uint6 [T][S][FP] cameralx15
Mesh[T][S]	1	11.3	268.2	307	bfloat16 Mesh[T][S] cameralx15
[T][S]	1	11.2	268.2	304	bfloat16 [T][S] cameralx15

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

Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
near	int3 Mesh[T][S][FP] cameralx15	80	34	99	65	50	2.0	1.29	10.4	147	50.3

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

Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
near	int3 Mesh[T][S][FP] cameralx15	80	34	99	65	50	2.0	1.29	10.4	147	50.3
-	int4 Mesh[T][S][FP] cameralx15	70	82	87	79	67	1.5	1.19	9.0	355	67.0
-	uint4 [T][S][HP]Async cameralx15	76	56	98	75	67	1.5	1.12	9.8	244	67.1
-	nf4 [T][S][FP] cameralx15	71	44	97	67	67	1.5	1.01	9.2	192	67.0
-	nf4 Mesh[T][S][FP] cameralx15	71	44	97	67	67	1.5	1.01	9.1	190	67.0
-	uint5 Mesh[T][S][FP] cameralx15	71	28	99	59	83	1.2	0.70	9.2	124	83.9
keep	uint8 Mesh[T][S][FP] cameralx15	86	85	95	89	133	0.8	0.67	11.1	371	134.2
-	int8 Mesh[T][S][FP] cameralx15	74	94	93	87	133	0.8	0.65	9.5	410	134.1
-	uint8 [T][S][FP] cameralx15	76	87	96	86	133	0.8	0.64	9.7	376	134.2
keep	uint6 [T][S][FP] cameralx15	100	26	99	64	100	1.0	0.64	12.9	113	100.7
-	uint8 [T][S][HP] cameralx15	70	86	95	83	133	0.8	0.62	9.1	375	134.2
keep	fp6 [T][S][HP] cameralx15	87	26	100	61	100	1.0	0.61	11.2	113	100.6
keep	uint6 [T][S][HP] cameralx15	84	26	99	60	100	1.0	0.60	10.8	114	100.7
keep	fp6 [T][S][FP] cameralx15	81	26	100	59	100	1.0	0.59	10.5	113	100.6
keep	int6 Mesh[T][S][FP] cameralx15	81	26	99	59	100	1.0	0.59	10.4	112	100.6
keep	bfloat16 Mesh[T][S] cameralx15	88	71	98	85	266	0.4	0.32	11.3	307	268.2
keep	bfloat16 [T][S] cameralx15	87	70	97	84	266	0.4	0.31	11.2	304	268.2
-	float16 Mesh[T][S] cameralx15	77	80	92	83	266	0.4	0.31	10.0	348	268.2
-	uint16 [T][S][HP] cameralx15	78	59	98	77	267	0.4	0.29	10.1	256	268.3
-	uint16 Mesh[T][S][FP] cameralx15	76	58	99	76	267	0.4	0.29	9.9	253	268.3

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

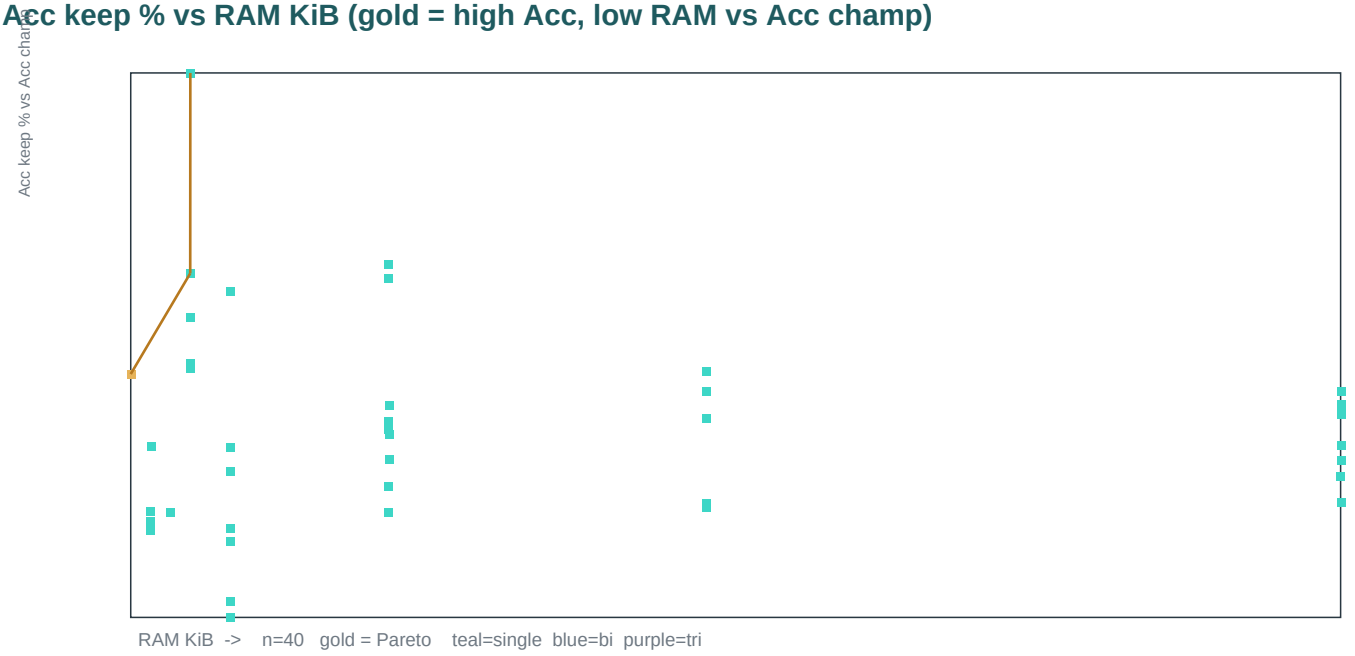
Band	Cell	Acc%	Thru%	Avail%	Q%	LPD	Thru	Avail
keep	uint8 Mesh[T][S][FP] cameralx15	86	85	95	89	0.67	371	28.5
-	float32 [T][S] cameralx15	72	100	96	88	0.17	434	28.8
-	int8 Mesh[T][S][FP] cameralx15	74	94	93	87	0.65	410	27.8
-	uint8 [T][S][FP] cameralx15	76	87	96	86	0.64	376	28.6
keep	bfloat16 Mesh[T][S] cameralx15	88	71	98	85	0.32	307	29.3
keep	bfloat16 [T][S] cameralx15	87	70	97	84	0.31	304	29.0
-	uint8 [T][S][HP] cameralx15	70	86	95	83	0.62	375	28.4
-	float16 Mesh[T][S] cameralx15	77	80	92	83	0.31	348	27.6
-	int4 Mesh[T][S][FP] cameralx15	70	82	87	79	1.19	355	26.1
-	uint64 [T][S][HP] cameralx15	79	59	98	77	0.07	255	29.4

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 cameralx15	39	63	69	55	17	6.0	0.00	5.0	274	16.8
trap	binary step_sgd cameralx15	42	77	80	63	17	6.0	0.00	5.4	335	16.8
trap	binary tween cameralx15	7	52	61	28	17	6.0	0.00	0.9	225	16.8
trap	binary tween_chain cameralx15	50	63	69	60	17	6.0	0.00	6.5	275	16.8
trap	binary step_tween cameralx15	12	61	69	37	17	6.0	0.00	1.5	265	16.8

Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
trap	binary step_tween_chain cameralx15	30	78	80	57	17	6.0	0.00	3.9	338	16.8
trap	binary MeshBP cameralx15	51	62	69	60	17	6.0	0.00	6.5	267	16.8
trap	binary Mesh[T] cameralx15	15	52	62	37	17	6.0	0.00	2.0	227	16.8
trap	binary Mesh[T]Chain cameralx15	56	63	69	62	17	6.0	0.00	7.2	275	16.8
trap	binary [T][S] cameralx15	18	82	87	50	17	6.0	0.00	2.3	357	16.8

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

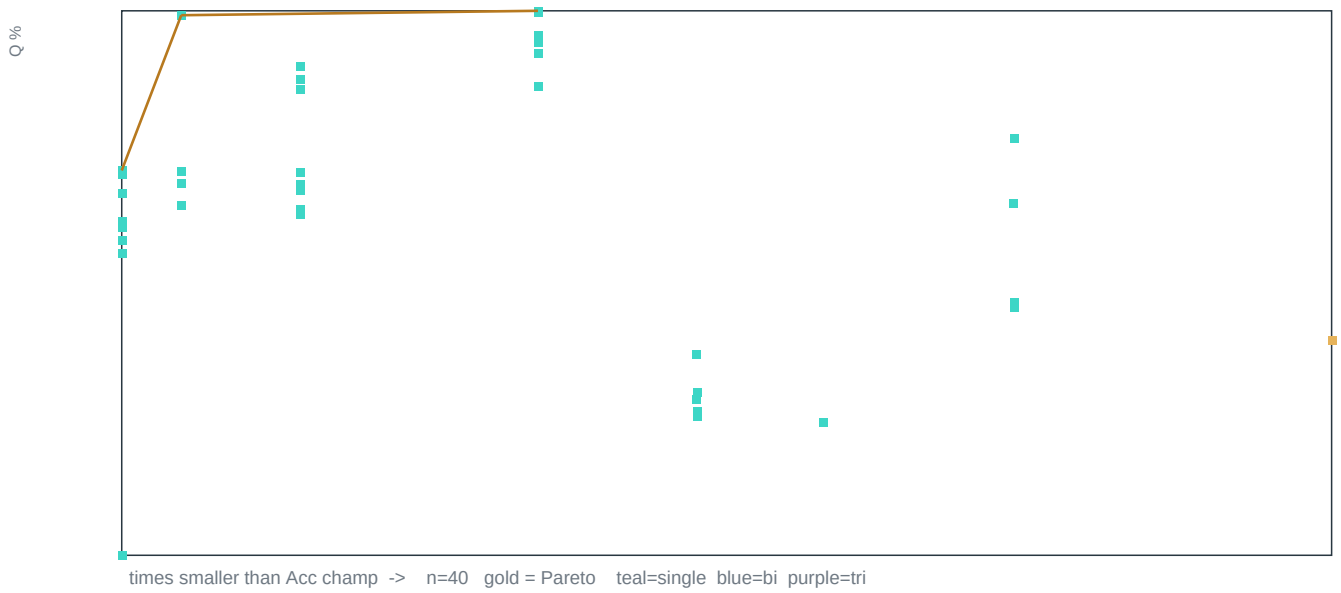


Q% vs RAM KiB (gold = high consciousness, low RAM)



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

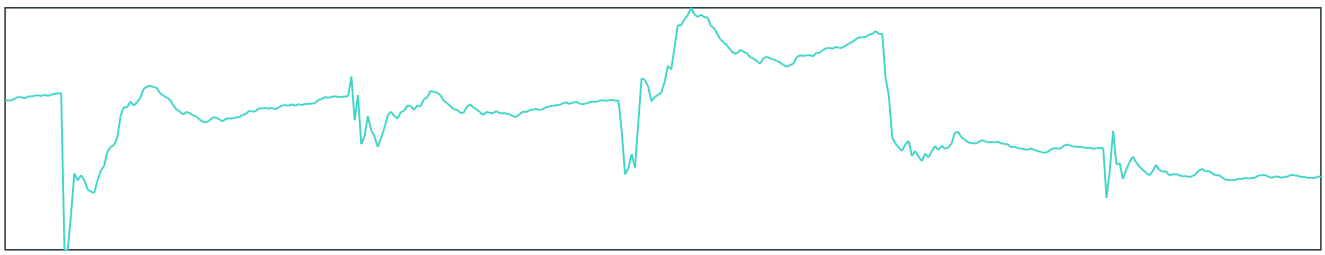
Q% vs shrink vs Acc champ (gold = upper right)



Top Lucy density (LPD)

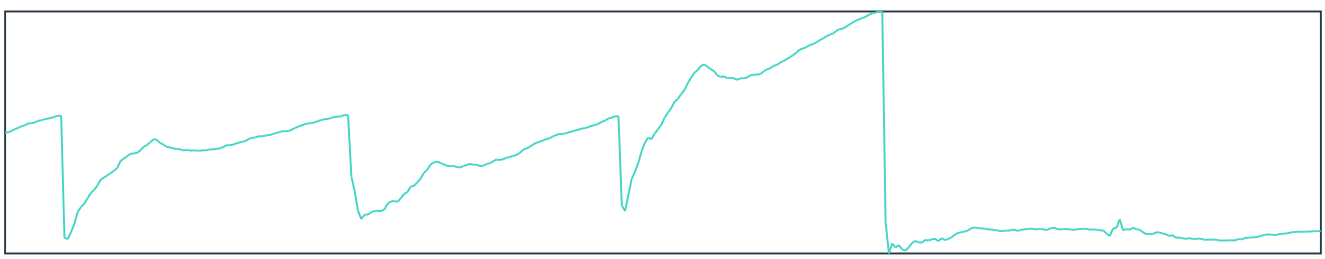


Live pulse (Score)



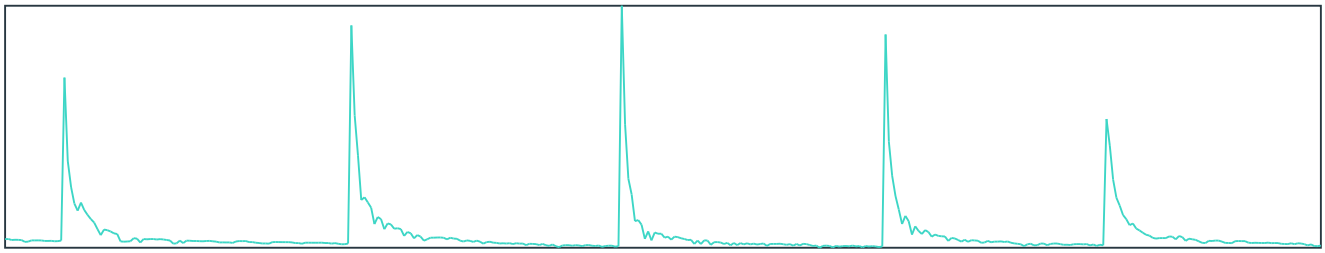
n=400 min=0.00 max=1.42

Live pulse (SoftAcc)



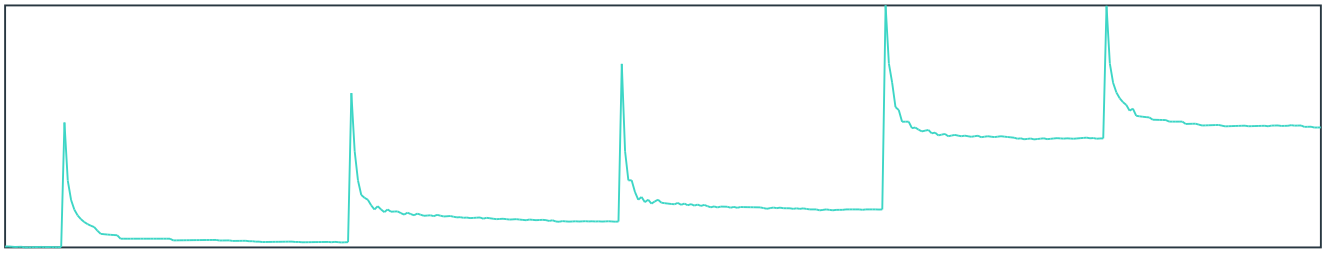
n=400 min=1.54 max=1.55

Live pulse (Availability)



n=400 min=25.91 max=34.52

Live pulse (Throughput)



n=400 min=93.61 max=159.74

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