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 - 2026-08-20 16:32:05 - 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 - cameralx5 - tinyshakespeare - 4096 windows - seq 32 - causal MHA - A->B->A2 - SIMD

Lucy champions (this tide)

Axis	Cell	Score	Soft	Acc	Thru	Avail
hard acc	int64|none|sgd|cameralx5|simd	4.57	6.1	6.2	303.5	24.3
throughput	int8|none|[T][S][L]Cache|cameralx5|simd	29.96	4.3	8.9	920.1	36.7
availability	int|none|[T][S][L]Cache|cameralx5|simd	8.58	3.8	5.2	444.2	37.2
lucy score	int8|none|[T][S][L]Cache|cameralx5|simd	29.96	4.3	8.9	920.1	36.7
mobile score (trap)	int2|none|Mesh[T][S]Sparse|cameralx5|simd	18.02	4.0	6.2	828.7	35.2
acc/sec	int8|none|[T][S][L]Cache|cameralx5|simd	29.96	4.3	8.9	920.1	36.7

Lucy axis champions (this tide)

Axis	Mode	DType	Arch	Value
hard_acc	[T]Alt	int2	cameralx5	10.33
throughput	[T][S][L]Cache	int8	cameralx5	920.07
availability	[T][S][L]Cache	int	cameralx5	37.20
score	[T][S][L]Cache	int8	cameralx5	29.96
soft_acc	sgd	int64	cameralx5	6.12
acc_thru	[T][S][L]Cache	int8	cameralx5	81.59
realtime	[T][S][L]Cache	int8	cameralx5	337.90
adapt	sgd	int64	cameralx5	6.69
keep_learn	[T][S]Sparse	int2	cameralx5	10.87
acc_per_sec	[T][S][L]Cache	int8	cameralx5	1.19
consistency	[T][S][L]Cache	int	cameralx5	13.33
stability	sgd	fp4	cameralx5	100.00
mobile_score	Mesh[T][S]Sparse	int2	cameralx5	784.49
lpd	step_tween_chain	int2	cameralx5	0.61
mspeed	[T][S][L]Cache	int8	cameralx5	1.00
mavail	[T][S][L]Cache	int32	cameralx5	1.00
mix	[T][S][L]Cache	int8	cameralx5	0.95
gold_std	[T][S]Sparse	nf4	cameralx5	47.05

Best settings per train mode

Mode	DType	Format	Score	Soft	Acc	Avail	n
[T][S][L]Cache	int8	none	30.0	4.3	8.9	36.7	34
[T][S]Sparse	int8	none	23.4	2.8	7.6	35.5	34
Mesh[T][S]Sparse	int8	none	20.8	2.0	6.8	35.4	34
[T][S][L]	float32	none	18.8	5.3	5.7	36.2	34
Mesh[T][S][FP]	int8	none	12.7	3.3	9.3	26.3	34
[T][S]	int8	none	12.6	2.0	9.3	25.6	34
[T][S][FP]	uint8	none	12.2	2.8	9.5	26.8	34
Step[T][S][L]Cache	float32	none	11.8	1.5	6.3	29.9	34
[T][S][HP]	uint8	none	11.7	3.0	9.4	26.5	34
[T][S][HP]Async	int8	none	10.5	4.3	7.7	26.3	34
Mesh[T][S]	int8	none	10.0	1.8	7.8	25.7	34

step_sgd	int8	none	9.5	4.0	5.9	26.5	34
Step[T][S][L]	float32	none	8.6	1.5	4.5	29.9	34
step_tween_chain	int2	none	8.2	4.9	7.7	23.0	34
Mesh[T]Chain	int8	none	7.7	4.5	8.2	22.2	34
sgd	uint8	none	7.7	4.5	6.8	24.1	34
MeshBP	int8	none	7.3	4.2	7.3	22.6	34
tween_chain	int4	none	6.2	4.8	7.6	20.6	34
step_tween	uint8	none	6.0	1.5	6.0	23.5	34
Step[T][S]Sparse	float32	none	5.9	1.5	6.4	22.5	34
Step[T][S][HP]Async	float32	none	5.2	1.5	5.5	22.9	34
Step[T][S][FP]	float32	none	5.2	1.5	5.3	23.0	34
Step[T][S][HP]	float64	none	5.1	1.5	6.8	23.6	34
Step[T][S]	float32	none	5.0	1.5	4.6	23.5	34
tween	float32	none	4.9	1.5	5.9	20.4	34
Mesh[T]	float32	none	4.2	1.5	5.5	20.2	34
Step[T]Alt	float32	none	3.1	1.5	6.8	16.3	34
[T]Alt	int2	none	2.9	2.0	10.3	13.2	34
Mesh[T]Alt	float32	none	2.4	0.1	2.6	22.1	34

Best dtype per mode

Mode	Winner dtype	Score	Soft	Acc
[T][S][L]Cache	int8	30.0	4.3	8.9
[T][S]Sparse	int8	23.4	2.8	7.6
Mesh[T][S]Sparse	int8	20.8	2.0	6.8
[T][S][L]	float32	18.8	5.3	5.7
Mesh[T][S][FP]	int8	12.7	3.3	9.3
[T][S]	int8	12.6	2.0	9.3
[T][S][FP]	uint8	12.2	2.8	9.5
Step[T][S][L]Cache	float32	11.8	1.5	6.3
[T][S][HP]	uint8	11.7	3.0	9.4
[T][S][HP]Async	int8	10.5	4.3	7.7
Mesh[T][S]	int8	10.0	1.8	7.8
step_sgd	int8	9.5	4.0	5.9
Step[T][S][L]	float32	8.6	1.5	4.5
step_tween_chain	int2	8.2	4.9	7.7
Mesh[T]Chain	int8	7.7	4.5	8.2
sgd	uint8	7.7	4.5	6.8
MeshBP	int8	7.3	4.2	7.3
tween_chain	int4	6.2	4.8	7.6
step_tween	uint8	6.0	1.5	6.0
Step[T][S]Sparse	float32	5.9	1.5	6.4
Step[T][S][HP]Async	float32	5.2	1.5	5.5
Step[T][S][FP]	float32	5.2	1.5	5.3
Step[T][S][HP]	float64	5.1	1.5	6.8
Step[T][S]	float32	5.0	1.5	4.6
tween	float32	4.9	1.5	5.9
Mesh[T]	float32	4.2	1.5	5.5
Step[T]Alt	float32	3.1	1.5	6.8
[T]Alt	int2	2.9	2.0	10.3
Mesh[T]Alt	float32	2.4	0.1	2.6

Best mode per dtype

DType	Winner mode	Score	Soft	Acc
int8	[T][S][L]Cache	30.0	4.3	8.9
uint8	[T][S][L]Cache	23.8	4.4	8.3
float32	[T][S][L]	18.8	5.3	5.7
int2	Mesh[T][S]Sparse	18.0	4.0	6.2
uint16	[T][S][L]Cache	17.6	4.5	9.0
int32	[T][S][L]Cache	16.8	4.6	8.7
int4	[T][S][L]Cache	16.2	1.5	5.1
uint32	[T][S][L]Cache	16.1	4.4	8.2
int16	[T][S][L]Cache	15.5	4.6	8.2
uint64	[T][S][L]	15.1	4.9	8.3
uintptr	[T][S][L]Cache	14.6	4.3	8.6
uint4	Mesh[T][S]Sparse	14.6	2.2	7.7
nf4	[T][S]Sparse	13.6	2.3	9.0
uint	[T][S]Sparse	13.4	2.6	8.3
float64	[T][S][L]	13.2	5.1	5.6
fp8e5m2	[T][S][L]	12.0	4.0	7.3
int64	[T][S][L]	10.7	5.3	5.9
bfloat16	[T][S][L]	10.5	4.3	4.8
float16	[T][S][L]	9.9	5.0	5.6
fp8e4m3	Mesh[T][S]Sparse	9.7	5.0	5.0
int	[T][S][L]Cache	8.6	3.8	5.2
complex64	[T][S][L]	8.1	5.0	5.6
fp4	[T][S]Sparse	8.1	1.5	3.3
uint6	Mesh[T][S]Sparse	8.1	2.5	8.5
complex128	[T][S][L]	7.8	5.1	5.5
uint5	[T][S]Sparse	7.6	2.1	7.3
fp6	[T][S][L]	7.3	2.1	9.8
int5	Mesh[T][S]Sparse	7.2	2.0	7.3
binary	step_sgd	7.2	4.1	6.0
ternary	step_sgd	6.9	3.4	5.7
int6	[T][S]Sparse	6.4	1.8	7.2
uint3	[T][S][L]Cache	6.3	1.5	5.3
int3	[T][S]Sparse	6.1	1.8	5.2
uint2	step_sgd	5.3	3.8	5.7

Leaderboard (Lucy Score)

#	Cell	Score	Soft	Acc	Thru	Avail
1	int8|none|[T][S][L]Cache|cameralx5|simd	30.0	4.3	8.9	920.1	36.7
2	uint8|none|[T][S][L]Cache|cameralx5|simd	23.8	4.4	8.3	785.1	36.4
3	int8|none|[T][S]Sparse|cameralx5|simd	23.4	2.8	7.6	869.0	35.5
4	int8|none|Mesh[T][S]Sparse|cameralx5|simd	20.8	2.0	6.8	856.5	35.4
5	uint8|none|[T][S]Sparse|cameralx5|simd	19.5	2.1	6.9	788.3	36.2
6	float32|none|[T][S][L]|cameralx5|simd	18.8	5.3	5.7	905.4	36.2
7	int8|none|[T][S][L]|cameralx5|simd	18.5	4.5	6.6	816.0	34.2
8	int2|none|Mesh[T][S]Sparse|cameralx5|simd	18.0	4.0	6.2	828.7	35.2
9	uint16|none|[T][S][L]Cache|cameralx5|simd	17.6	4.5	9.0	531.8	36.7
10	int32|none|[T][S][L]Cache|cameralx5|simd	16.8	4.6	8.7	516.7	37.2
11	int4|none|[T][S][L]Cache|cameralx5|simd	16.2	1.5	5.1	876.5	36.1
12	uint32|none|[T][S][L]Cache|cameralx5|simd	16.1	4.4	8.2	534.7	36.9
13	uint16|none|[T][S]Sparse|cameralx5|simd	15.6	2.9	8.1	531.1	36.5
14	int4|none|Mesh[T][S]Sparse|cameralx5|simd	15.6	1.8	5.4	823.3	35.2

15	int16|none|[T][S][L]Cache|cameralx5|simd	15.5	4.6	8.2	510.8	36.9
16	uint32|none|Mesh[T][S]Sparse|cameralx5|simd	15.1	2.8	8.2	511.0	36.1
17	uint64|none|[T][S][L]|cameralx5|simd	15.1	4.9	8.3	509.4	35.6
18	uint64|none|[T][S]Sparse|cameralx5|simd	15.0	2.6	7.8	530.4	36.4
19	uint64|none|[T][S][L]Cache|cameralx5|simd	14.8	4.3	7.6	533.3	36.7
20	uint16|none|Mesh[T][S]Sparse|cameralx5|simd	14.8	2.3	7.7	526.7	36.6

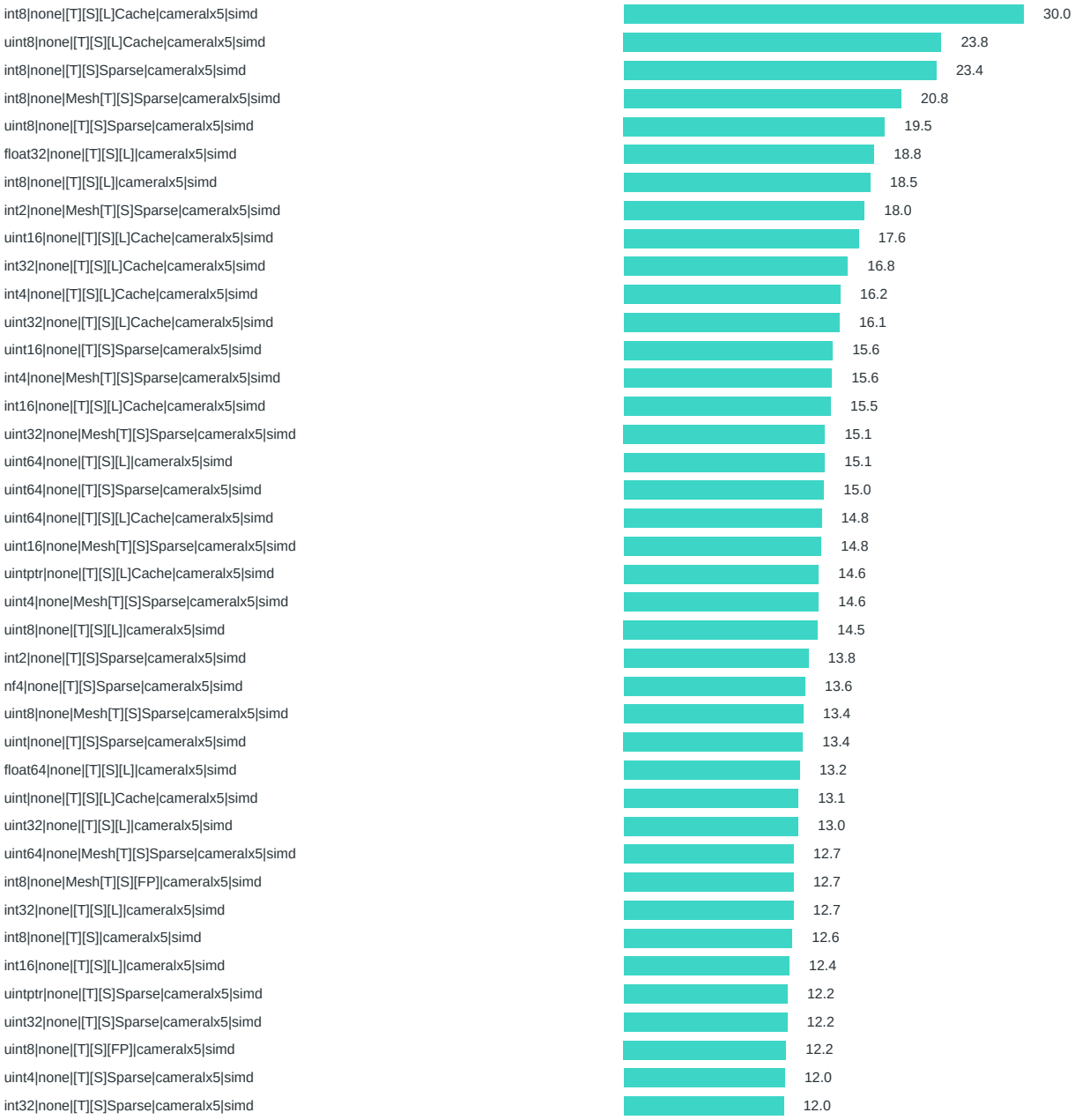
Leaderboard (SoftAcc)

#	Cell	Score	Soft	Acc	Thru	Avail
1	float32|none|[T][S][L]|cameralx5|simd	18.8	5.3	5.7	905.4	36.2
2	float64|none|[T][S][L]|cameralx5|simd	13.2	5.1	5.6	648.6	36.2
3	uint64|none|[T][S][L]|cameralx5|simd	15.1	4.9	8.3	509.4	35.6
4	int16|none|[T][S][L]|cameralx5|simd	12.4	4.7	7.2	483.9	35.7
5	uint32|none|[T][S][L]|cameralx5|simd	13.0	4.6	7.3	501.6	35.4
6	int16|none|[T][S][L]Cache|cameralx5|simd	15.5	4.6	8.2	510.8	36.9
7	int32|none|[T][S][L]|cameralx5|simd	12.7	4.6	7.1	492.1	36.2
8	int32|none|[T][S][L]Cache|cameralx5|simd	16.8	4.6	8.7	516.7	37.2
9	int8|none|[T][S][L]|cameralx5|simd	18.5	4.5	6.6	816.0	34.2
10	uint16|none|[T][S][L]Cache|cameralx5|simd	17.6	4.5	9.0	531.8	36.7
11	uint8|none|[T][S][L]Cache|cameralx5|simd	23.8	4.4	8.3	785.1	36.4
12	uint32|none|[T][S][L]Cache|cameralx5|simd	16.1	4.4	8.2	534.7	36.9
13	uintptr|none|[T][S][L]Cache|cameralx5|simd	14.6	4.3	8.6	462.5	36.8
14	uint64|none|[T][S][L]Cache|cameralx5|simd	14.8	4.3	7.6	533.3	36.7
15	uint8|none|[T][S][L]|cameralx5|simd	14.5	4.3	6.1	697.9	34.0
16	int8|none|[T][S][L]Cache|cameralx5|simd	30.0	4.3	8.9	920.1	36.7
17	uint|none|[T][S][L]Cache|cameralx5|simd	13.1	4.2	7.7	462.4	36.8
18	int2|none|Mesh[T][S]Sparse|cameralx5|simd	18.0	4.0	6.2	828.7	35.2
19	int8|none|Mesh[T][S][FP]|cameralx5|simd	12.7	3.3	9.3	517.7	26.3
20	uint16|none|[T][S]Sparse|cameralx5|simd	15.6	2.9	8.1	531.1	36.5

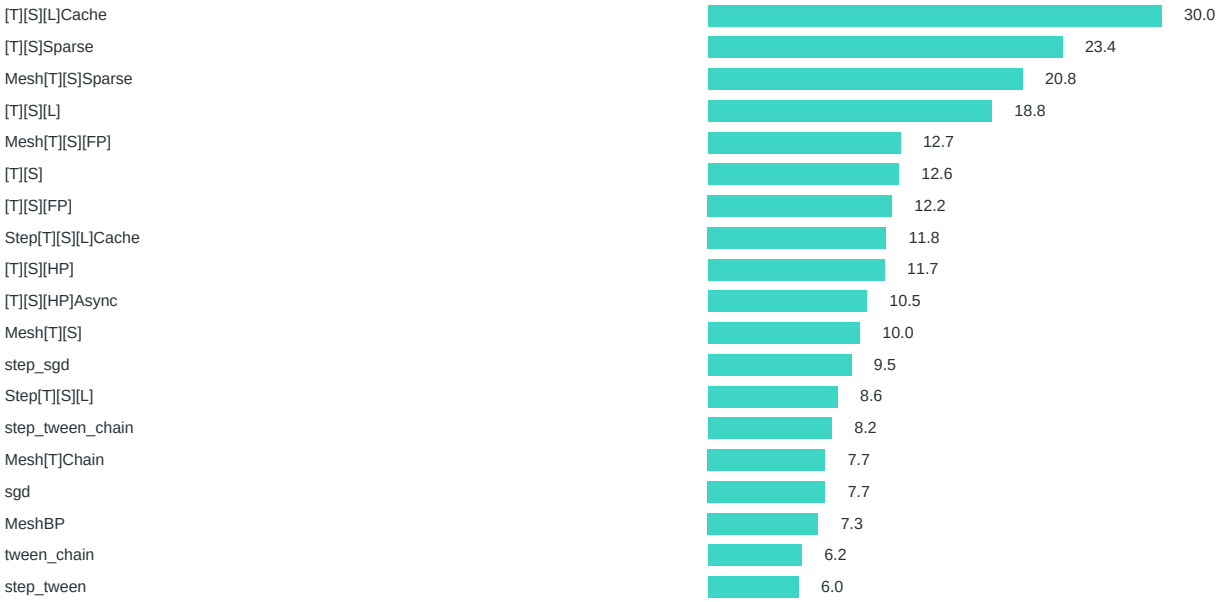
Leaderboard (hard Acc)

#	Cell	Score	Soft	Acc	Thru	Avail
1	uint8|none|[T][S][FP]|cameralx5|simd	12.2	2.8	9.5	476.9	26.8
2	int8|none|[T][S]|cameralx5|simd	12.6	2.0	9.3	527.5	25.6
3	int8|none|Mesh[T][S][FP]|cameralx5|simd	12.7	3.3	9.3	517.7	26.3
4	nf4|none|[T][S]Sparse|cameralx5|simd	13.6	2.3	9.0	411.3	36.5
5	uint16|none|[T][S][L]Cache|cameralx5|simd	17.6	4.5	9.0	531.8	36.7
6	int8|none|[T][S][L]Cache|cameralx5|simd	30.0	4.3	8.9	920.1	36.7
7	int32|none|[T][S][L]Cache|cameralx5|simd	16.8	4.6	8.7	516.7	37.2
8	uintptr|none|[T][S][L]Cache|cameralx5|simd	14.6	4.3	8.6	462.5	36.8
9	uint8|none|[T][S][L]Cache|cameralx5|simd	23.8	4.4	8.3	785.1	36.4
10	uint64|none|[T][S][L]|cameralx5|simd	15.1	4.9	8.3	509.4	35.6
11	uint|none|[T][S]Sparse|cameralx5|simd	13.4	2.6	8.3	445.8	36.2
12	int16|none|[T][S][L]Cache|cameralx5|simd	15.5	4.6	8.2	510.8	36.9
13	uint32|none|[T][S][L]Cache|cameralx5|simd	16.1	4.4	8.2	534.7	36.9
14	uint32|none|Mesh[T][S]Sparse|cameralx5|simd	15.1	2.8	8.2	511.0	36.1
15	uint16|none|[T][S]Sparse|cameralx5|simd	15.6	2.9	8.1	531.1	36.5
16	uint64|none|[T][S]Sparse|cameralx5|simd	15.0	2.6	7.8	530.4	36.4
17	uint4|none|Mesh[T][S]Sparse|cameralx5|simd	14.6	2.2	7.7	515.8	36.5
18	uint16|none|Mesh[T][S]Sparse|cameralx5|simd	14.8	2.3	7.7	526.7	36.6
19	uint|none|[T][S][L]Cache|cameralx5|simd	13.1	4.2	7.7	462.4	36.8
20	int8|none|[T][S]Sparse|cameralx5|simd	23.4	2.8	7.6	869.0	35.5

Top scores



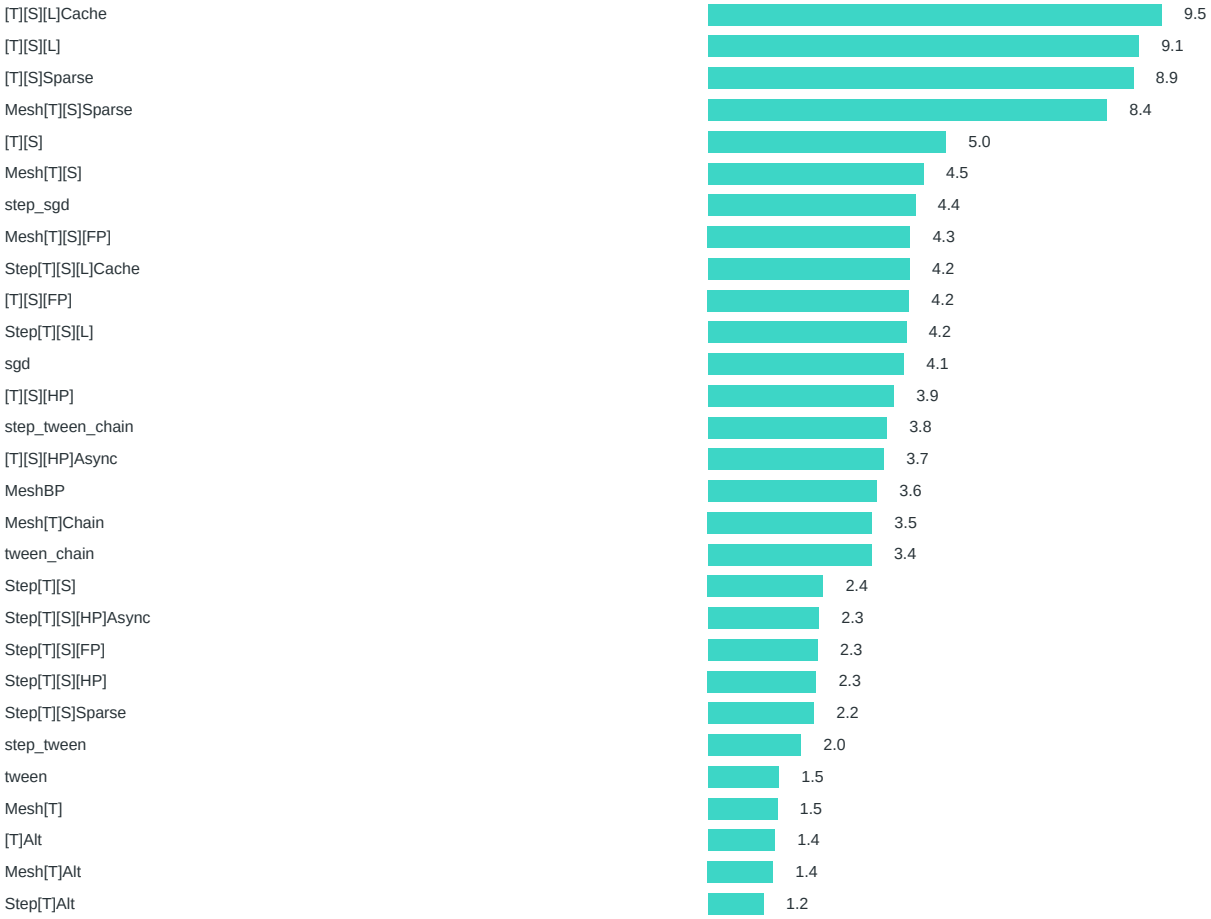
Best settings per mode



Best settings per mode



Mean Score by train mode



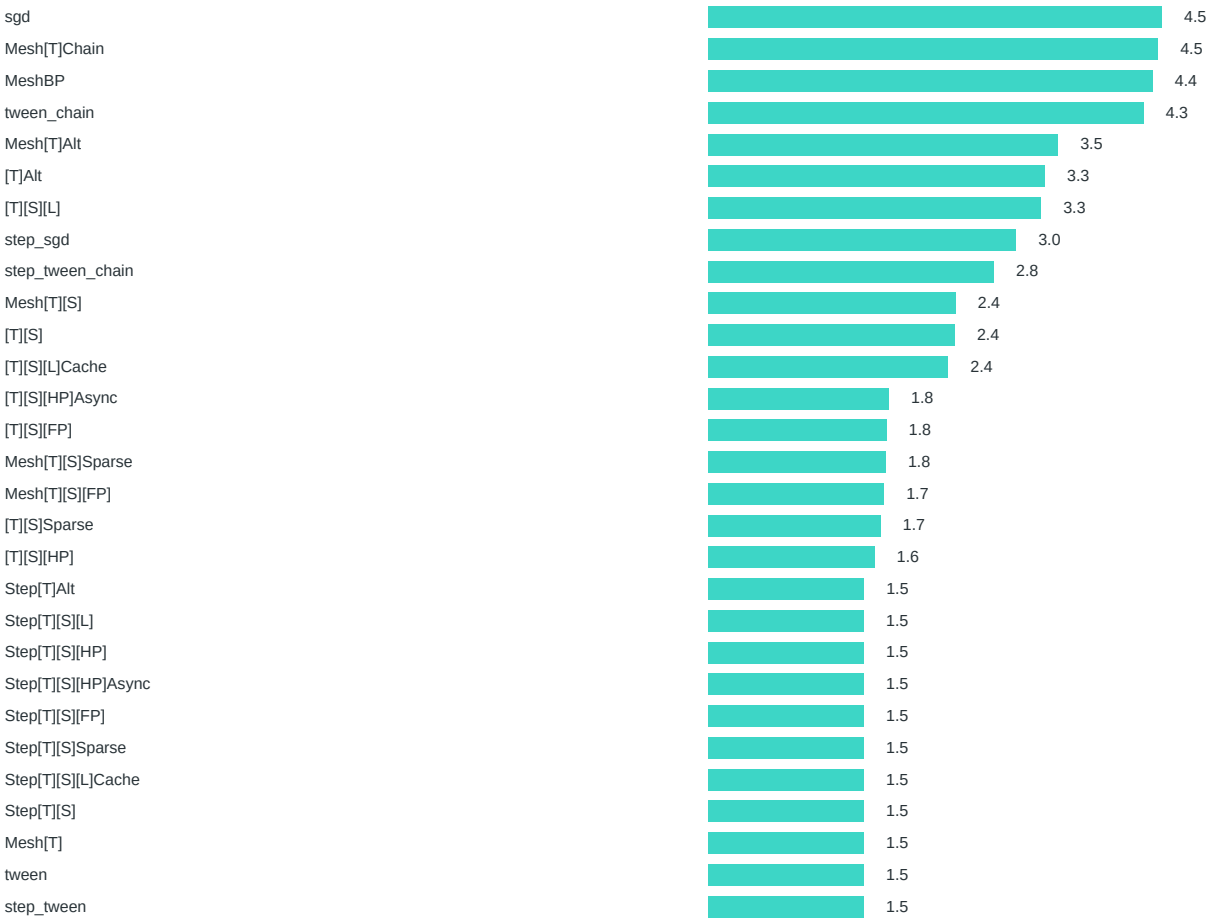
Mean hard Acc by train mode



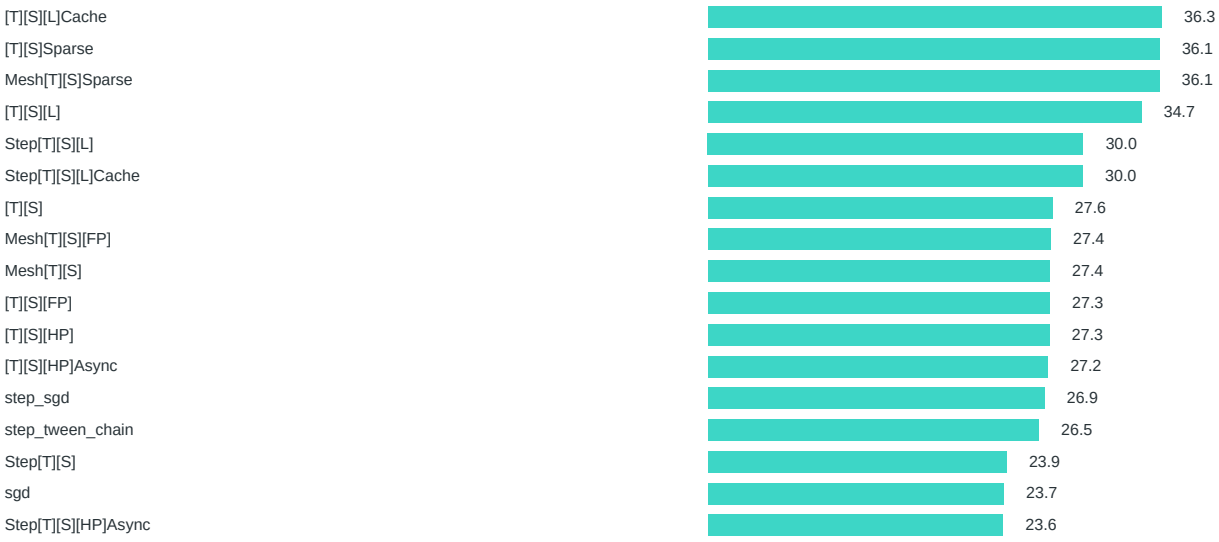
Mean hard Acc by train mode



Mean SoftAcc by train mode



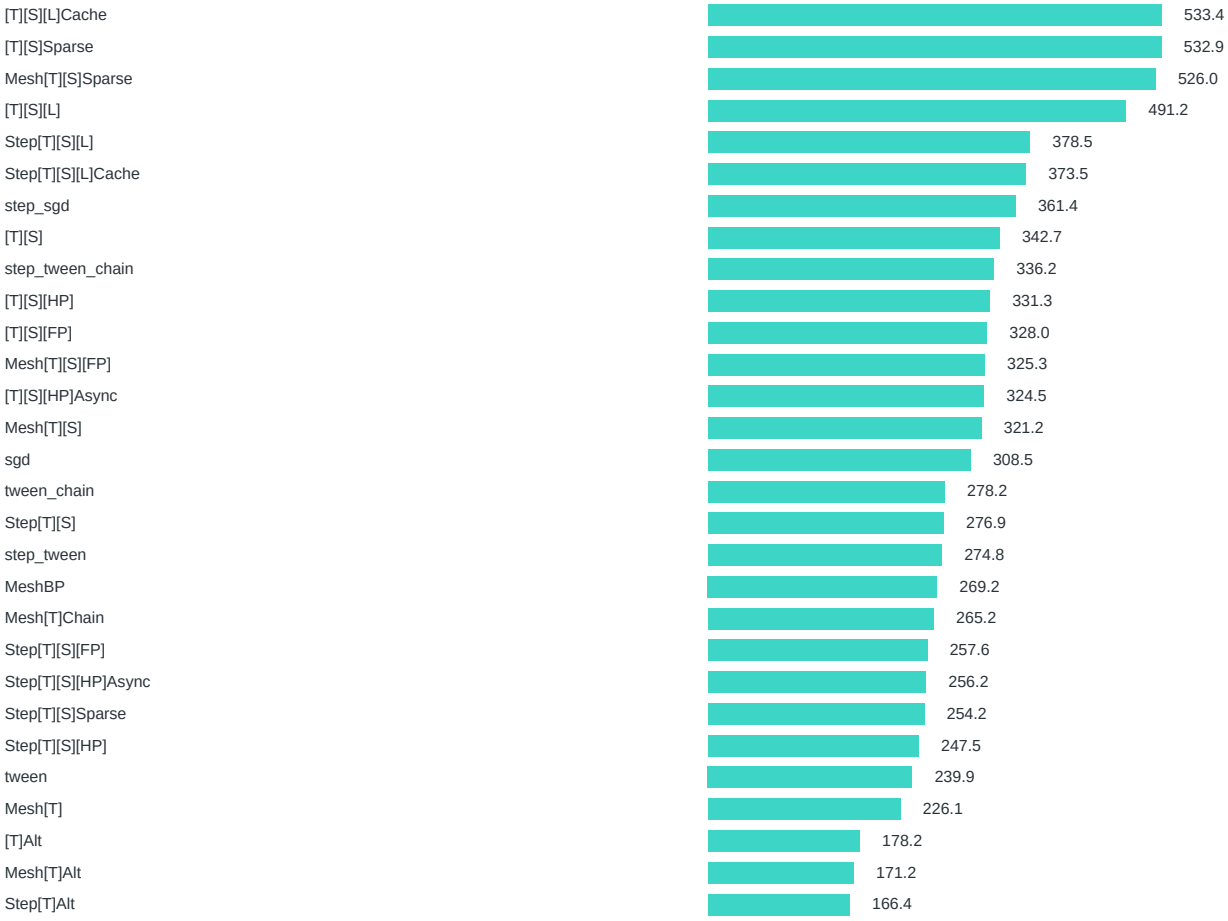
Mean Availability by train mode



Mean Availability by train mode



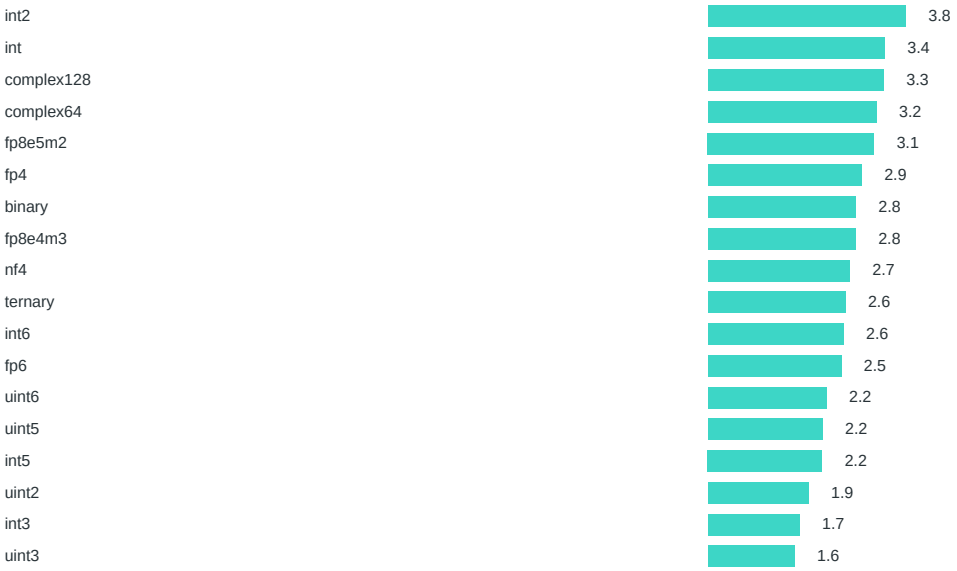
Mean Throughput by train mode



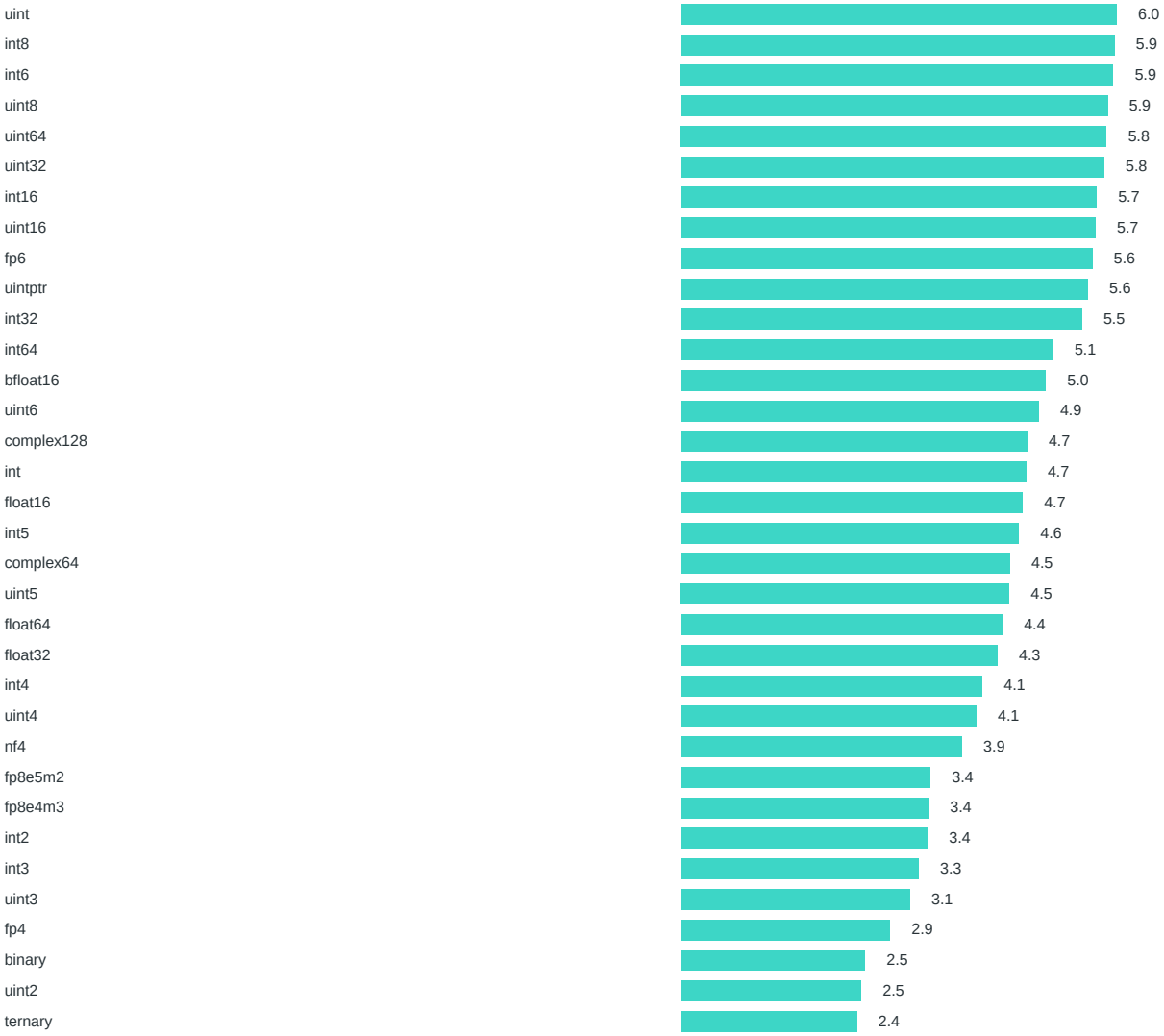
Mean Score by dtype



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

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	3	5	3	4	6	2	2	3	7	3	4	3
Mesh[T]	1	1	0	1	1	0	1	3	3	1	1	1
Mesh[T]Alt	2	2	1	2	2	1	1	2	2	1	0	2
Mesh[T]Chain	4	6	3	2	6	2	2	3	8	3	5	3
Mesh[T][S]	7	1	1	8	2	0	3	7	10	1	1	7
Mesh[T][S][FP]	9	1	1	7	9	4	5	3	13	4	2	6
Mesh[T][S]Sparse	9	18	4	10	16	7	5	5	21	3	4	11
Step[T]Alt	2	1	0	1	1	1	1	2	2	0	0	1
Step[T][S]	3	1	1	2	1	1	1	5	3	1	1	2
Step[T][S][FP]	2	1	1	3	1	1	1	4	4	1	1	2
Step[T][S][HP]	3	1	0	3	1	1	1	4	4	1	1	3
Step[T][S][HP]Async	2	1	1	4	2	1	1	4	4	1	1	2
Step[T][S][L]	4	2	1	5	3	2	2	9	5	2	2	5
Step[T][S][L]Cache	5	3	1	6	3	2	2	8	7	2	2	5
Step[T][S]Sparse	2	1	1	3	1	1	1	4	3	1	1	2
[T]Alt	2	3	1	2	1	1	1	1	3	1	0	2
[T][S]	8	2	1	8	2	1	3	6	13	1	4	7
[T][S][FP]	8	3	1	8	10	2	4	2	12	1	1	6
[T][S][HP]	6	1	1	2	7	4	5	3	11	2	2	7
[T][S][HP]Async	6	1	2	3	8	3	3	3	10	3	2	6
[T][S][L]	12	5	3	13	8	3	6	11	18	6	4	11
[T][S][L]Cache	15	5	3	17	16	5	5	7	30	7	7	13
[T][S]Sparse	10	14	6	12	11	6	6	6	23	14	4	13
sgd	4	6	3	4	7	3	2	5	8	4	5	3
step_sgd	4	6	4	5	8	2	3	3	9	5	7	5
step_tween	3	1	1	2	2	1	1	3	4	1	1	1
step_tween_chain	6	8	3	4	7	3	3	3	6	3	5	3
tween	2	1	1	1	1	0	1	3	2	0	1	2
tween_chain	2	5	3	3	6	2	2	4	5	3	6	3

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

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

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	4	4	3	3	4	2	2	4	5	2
Mesh[T]	2	1	0	2	1	0	1	2	2	1
Mesh[T]Alt	2	0	1	2	1	1	1	2	2	1
Mesh[T]Chain	2	4	3	3	4	2	2	3	5	2
Mesh[T][S]	6	1	1	7	1	1	3	8	9	6
Mesh[T][S][FP]	6	1	1	8	6	4	1	2	10	8
Mesh[T][S]Sparse	15	3	3	15	15	5	8	13	13	9
Step[T]Alt	1	0	0	1	1	0	1	1	2	1
Step[T][S]	3	1	1	3	1	1	1	3	5	3
Step[T][S][FP]	3	1	1	3	1	1	1	3	5	3
Step[T][S][HP]	3	1	0	3	1	1	1	3	4	2
Step[T][S][HP]Async	3	1	0	3	1	2	1	3	4	2
Step[T][S][L]	7	2	1	4	2	2	2	6	6	5
Step[T][S][L]Cache	5	1	1	5	3	2	2	5	4	6
Step[T][S]Sparse	3	1	0	3	1	1	1	2	3	3
[T]Alt	2	1	1	2	1	1	1	2	3	2
[T][S]	8	1	1	9	1	1	3	8	11	8
[T][S][FP]	8	1	1	9	2	2	3	8	12	5
[T][S][HP]	6	2	1	7	3	4	1	7	12	7
[T][S][HP]Async	5	1	1	5	9	3	2	4	7	5
[T][S][L]	11	3	4	13	11	4	6	15	15	11
[T][S][L]Cache	18	3	6	16	11	4	5	15	24	15
[T][S]Sparse	16	3	2	12	12	8	6	15	20	12
sgd	4	4	3	4	5	2	1	5	8	3
step_sgd	3	5	4	4	5	2	2	6	9	3
step_tween	2	1	1	3	1	1	1	3	6	1
step_tween_chain	4	4	2	5	4	3	2	5	6	3
tween	2	1	0	2	1	0	1	2	2	1
tween_chain	4	4	2	3	5	2	2	4	3	3

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

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

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

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

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

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

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	6	6	7	5	6	7	6	7	6	4
Mesh[T]	3	2	1	3	2	1	3	5	3	3
Mesh[T]Alt	7	2	9	7	6	6	6	8	7	7
Mesh[T]Chain	4	7	7	5	6	6	6	5	6	4
Mesh[T][S]	7	1	2	8	2	2	7	9	8	8
Mesh[T][S][FP]	6	1	2	9	6	9	2	2	9	9
Mesh[T][S]Sparse	8	2	3	8	8	5	8	7	5	5
Step[T]Alt	5	1	1	5	2	3	5	5	4	5
Step[T][S]	4	2	1	4	2	3	4	5	5	4
Step[T][S][FP]	4	1	1	5	2	4	4	4	5	5
Step[T][S][HP]	5	2	1	5	2	3	4	4	5	4
Step[T][S][HP]Async	5	2	1	5	1	5	4	4	4	4
Step[T][S][L]	6	2	1	4	2	4	4	5	4	5
Step[T][S][L]Cache	5	1	1	4	2	4	4	4	3	6
Step[T][S]Sparse	4	2	1	5	2	4	3	3	4	5
[T]Alt	8	2	8	7	5	6	6	7	8	7
[T][S]	8	1	1	9	1	1	7	8	8	9
[T][S][FP]	9	1	2	9	2	4	7	9	10	6
[T][S][HP]	6	2	2	7	3	8	3	7	9	9
[T][S][HP]Async	6	1	2	6	10	6	4	4	6	7
[T][S][L]	6	2	4	7	6	4	8	8	6	7
[T][S][L]Cache	9	1	5	8	6	4	6	8	8	9
[T][S]Sparse	8	2	2	6	7	7	6	8	7	8
sgd	6	6	7	5	6	6	4	6	7	4
step_sgd	3	6	7	4	5	4	5	6	6	4
step_tween	3	1	2	4	2	2	3	4	6	2
step_tween_chain	4	5	4	5	4	6	4	6	4	4
tween	5	2	1	3	1	1	3	4	3	2
tween_chain	6	6	5	5	7	6	5	6	4	5

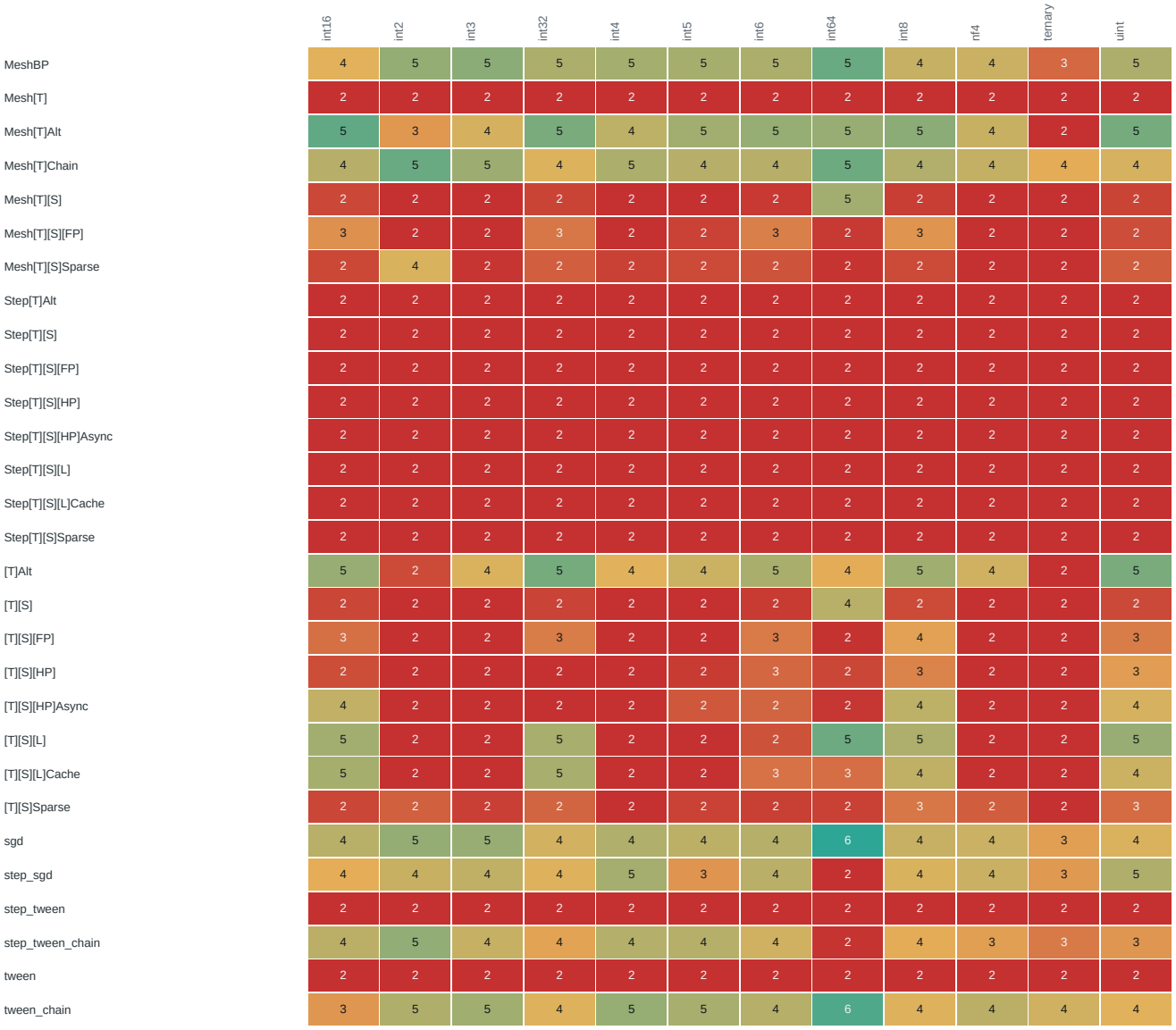
Honesty - mean SoftAcc, every mode x dtype (cols 1-12)

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

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

Honesty - mean SoftAcc, every mode x dtype (cols 13-24)

Honesty - mean SoftAcc, every mode x dtype (cols 13-24)



	int16	int2	int3	int32	int4	int5	int6	int64	int8	nf4	ternary	uint
MeshBP	4	5	5	5	5	5	5	5	4	4	3	5
Mesh[T]	2	2	2	2	2	2	2	2	2	2	2	2
Mesh[T]Alt	5	3	4	5	4	5	5	5	5	4	2	5
Mesh[T]Chain	4	5	5	4	5	4	4	5	4	4	4	4
Mesh[T][S]	2	2	2	2	2	2	2	5	2	2	2	2
Mesh[T][S][FP]	3	2	2	3	2	2	3	2	3	2	2	2
Mesh[T][S]Sparse	2	4	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	5	2	4	5	4	4	5	4	5	4	2	5
[T][S]	2	2	2	2	2	2	2	4	2	2	2	2
[T][S][FP]	3	2	2	3	2	2	3	2	4	2	2	3
[T][S][HP]	2	2	2	2	2	2	3	2	3	2	2	3
[T][S][HP]Async	4	2	2	2	2	2	2	2	4	2	2	4
[T][S][L]	5	2	2	5	2	2	2	5	5	2	2	5
[T][S][L]Cache	5	2	2	5	2	2	3	3	4	2	2	4
[T][S]Sparse	2	2	2	2	2	2	2	2	3	2	2	3
sgd	4	5	5	4	4	4	4	6	4	4	3	4
step_sgd	4	4	4	4	5	3	4	2	4	4	3	5
step_tween	2	2	2	2	2	2	2	2	2	2	2	2
step_tween_chain	4	5	4	4	4	4	4	2	4	3	3	3
tween	2	2	2	2	2	2	2	2	2	2	2	2
tween_chain	3	5	5	4	5	5	4	6	4	4	4	4

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

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

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	4	4	4	4	4	5	4	5	4	4
Mesh[T]	2	2	2	2	2	2	2	2	2	2
Mesh[T]Alt	5	2	4	5	4	4	4	5	5	5
Mesh[T]Chain	4	4	4	4	4	4	4	4	4	4
Mesh[T][S]	2	2	2	2	2	2	2	2	2	2
Mesh[T][S][FP]	2	2	2	3	2	2	2	2	3	3
Mesh[T][S]Sparse	2	2	2	3	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	5	2	3	5	4	5	5	5	5	5
[T][S]	2	2	2	2	2	2	2	2	2	2
[T][S][FP]	3	2	2	3	2	2	2	3	3	2
[T][S][HP]	3	2	2	3	2	2	2	2	3	3
[T][S][HP]Async	2	2	2	4	2	2	2	2	3	4
[T][S][L]	5	2	2	5	2	2	2	5	4	5
[T][S][L]Cache	4	2	2	4	2	2	2	4	4	4
[T][S]Sparse	3	2	2	2	2	2	2	3	2	3
sgd	4	4	4	4	4	4	4	4	4	4
step_sgd	3	4	4	4	4	4	4	4	4	4
step_tween	2	2	2	2	2	2	2	2	2	2
step_tween_chain	4	4	3	4	4	4	3	4	4	3
tween	2	2	2	2	2	2	2	2	2	2
tween_chain	4	4	4	4	4	4	4	4	3	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	22	21	24	23	23	23	23	22	24	23	23	23
Mesh[T]	20	18	21	21	21	20	21	19	21	21	20	21
Mesh[T]Alt	22	13	23	22	22	22	22	14	16	15	22	18
Mesh[T]Chain	22	20	24	24	24	22	23	22	24	24	23	24
Mesh[T][S]	27	25	29	29	27	26	28	26	29	29	27	29
Mesh[T][S][FP]	27	25	28	29	27	27	28	26	29	28	28	29
Mesh[T][S]Sparse	36	35	36	37	36	36	36	36	36	36	37	36
Step[T]Alt	16	13	18	18	17	16	17	16	17	17	16	18
Step[T][S]	24	22	25	24	24	24	24	23	25	25	24	25
Step[T][S][FP]	23	21	24	24	24	23	24	23	24	25	24	24
Step[T][S][HP]	22	20	24	23	23	22	24	22	24	23	23	24
Step[T][S][HP]Async	23	22	25	25	24	23	24	22	25	24	24	24
Step[T][S][L]	30	29	30	31	30	30	31	29	30	31	30	30
Step[T][S][L]Cache	30	29	30	31	30	30	30	29	30	30	30	31
Step[T][S]Sparse	23	21	24	24	24	23	24	22	25	25	24	24
[T]Alt	23	13	23	23	23	22	22	14	16	16	23	19
[T][S]	27	25	29	28	28	27	28	26	29	29	28	29
[T][S][FP]	27	25	29	28	27	26	27	26	29	28	28	28
[T][S][HP]	26	25	29	29	27	26	28	26	29	27	28	28
[T][S][HP]Async	27	25	28	28	26	26	28	26	28	27	27	28
[T][S][L]	35	32	35	36	35	36	36	35	34	34	34	36
[T][S][L]Cache	35	36	36	36	36	36	37	36	36	37	36	37
[T][S]Sparse	36	34	36	36	36	36	36	35	37	36	37	37
sgd	23	22	24	24	24	24	24	23	24	24	24	24
step_sgd	26	24	27	28	27	27	28	25	28	27	27	28
step_tween	22	20	24	24	24	23	24	22	24	23	23	24
step_tween_chain	26	23	27	27	27	25	28	25	28	26	27	27
tween	20	18	22	21	21	20	21	20	21	22	21	21
tween_chain	23	21	24	24	23	23	24	22	24	24	23	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	20	24	24	21	24	24	23	23	24	20	24
Mesh[T]	21	18	21	21	19	21	21	21	20	20	18	20
Mesh[T]Alt	16	13	16	16	13	16	16	19	14	15	12	16
Mesh[T]Chain	23	21	24	24	21	24	23	24	22	23	20	24
Mesh[T][S]	28	25	28	28	25	29	29	28	26	28	24	28
Mesh[T][S][FP]	29	24	29	28	25	29	29	29	26	28	24	28
Mesh[T][S]Sparse	36	35	36	36	35	37	37	36	35	36	36	37
Step[T]Alt	17	14	17	18	14	17	17	18	16	16	13	17
Step[T][S]	25	21	25	24	22	25	25	25	23	24	21	24
Step[T][S][FP]	24	20	24	24	21	25	25	25	22	24	20	24
Step[T][S][HP]	23	20	24	24	21	24	24	24	23	23	19	24
Step[T][S][HP]Async	24	21	25	24	21	24	25	24	22	24	21	24
Step[T][S][L]	30	29	30	30	30	30	30	30	29	30	29	30
Step[T][S][L]Cache	31	29	30	30	30	30	30	31	30	29	29	30
Step[T][S]Sparse	25	22	25	25	21	25	25	24	22	23	21	24
[T]Alt	16	13	16	16	13	16	16	18	15	15	12	16
[T][S]	28	24	29	29	25	29	29	28	26	28	24	28
[T][S][FP]	28	24	28	28	25	29	29	28	26	28	24	28
[T][S][HP]	28	24	29	28	25	28	28	28	26	27	24	27
[T][S][HP]Async	28	24	28	28	24	28	29	28	26	28	24	28
[T][S][L]	36	33	35	36	34	34	34	36	34	34	31	35
[T][S][L]Cache	37	35	37	37	36	37	37	37	37	35	35	37
[T][S]Sparse	36	35	37	36	35	36	37	36	36	37	35	36
sgd	24	21	24	25	22	24	24	24	23	24	21	24
step_sgd	28	23	28	28	24	27	27	28	27	27	24	28
step_tween	24	20	24	24	21	24	24	24	23	23	19	23
step_tween_chain	28	23	27	27	23	28	27	28	26	27	23	27
tween	21	18	21	21	19	21	21	21	20	21	18	21
tween_chain	24	20	24	23	21	24	24	24	22	24	20	23

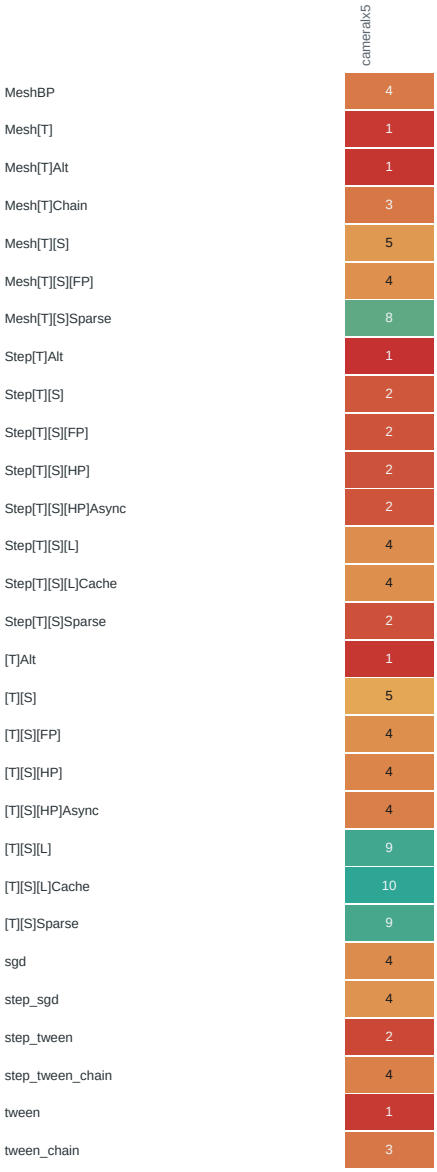
Honesty - mean Avail, every mode x dtype (cols 25-34)

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

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	24	23	23	24	24	24	24	23	23	23
Mesh[T]	21	20	20	21	21	21	21	20	20	20
Mesh[T]Alt	15	15	16	16	15	16	16	15	15	16
Mesh[T]Chain	23	23	24	23	23	23	24	23	22	24
Mesh[T][S]	27	27	28	27	28	28	28	27	26	28
Mesh[T][S][FP]	28	27	29	27	28	28	29	28	26	28
Mesh[T][S]Sparse	37	37	36	36	37	37	37	36	36	36
Step[T]Alt	17	17	16	17	17	17	17	17	16	17
Step[T][S]	24	25	24	24	24	24	25	24	23	24
Step[T][S][FP]	25	24	24	24	24	24	24	24	23	24
Step[T][S][HP]	23	23	23	24	23	23	24	23	23	24
Step[T][S][HP]Async	24	24	24	24	24	24	24	24	23	24
Step[T][S][L]	30	30	30	31	31	30	30	31	30	30
Step[T][S][L]Cache	30	30	30	30	30	30	30	30	30	30
Step[T][S]Sparse	24	24	24	24	24	25	24	24	23	24
[T]Alt	15	15	16	15	15	16	15	15	15	16
[T][S]	28	28	28	28	28	29	29	28	27	28
[T][S][FP]	28	28	28	28	28	28	29	28	27	28
[T][S][HP]	28	28	28	27	28	28	29	28	27	28
[T][S][HP]Async	28	27	28	28	28	28	28	27	27	28
[T][S][L]	35	34	34	35	35	35	34	36	34	35
[T][S][L]Cache	37	36	36	37	37	36	36	37	36	37
[T][S]Sparse	37	36	37	36	36	37	37	36	36	36
sgd	24	24	24	24	24	24	24	24	24	24
step_sgd	27	27	27	27	28	27	27	28	27	27
step_tween	24	23	23	24	24	23	24	24	24	24
step_tween_chain	27	27	27	27	27	27	27	27	26	27
tween	21	21	21	21	21	21	21	21	21	21
tween_chain	24	23	24	24	24	24	24	24	23	24

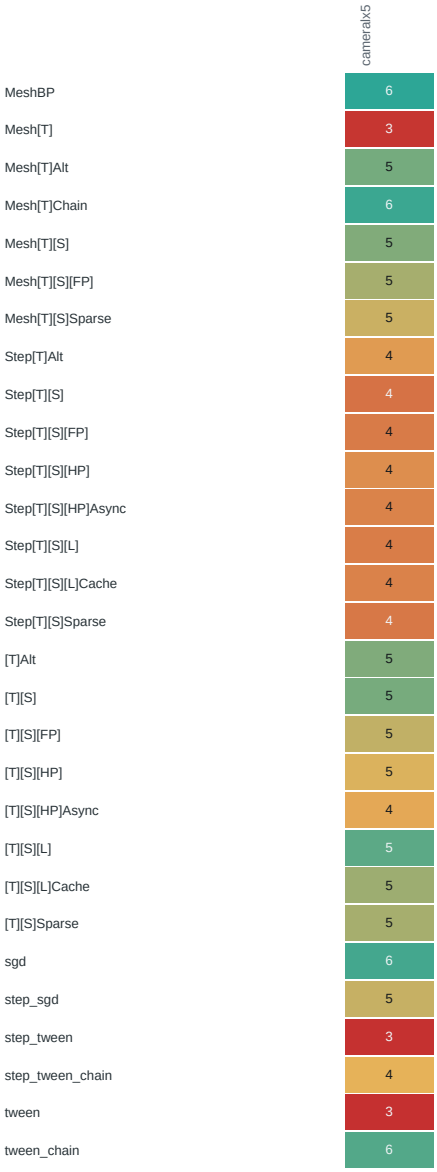
Mean Score, every mode x arch

Mean Score, every mode x arch



Mean hard Acc, every mode x arch

Mean hard Acc, every mode x arch

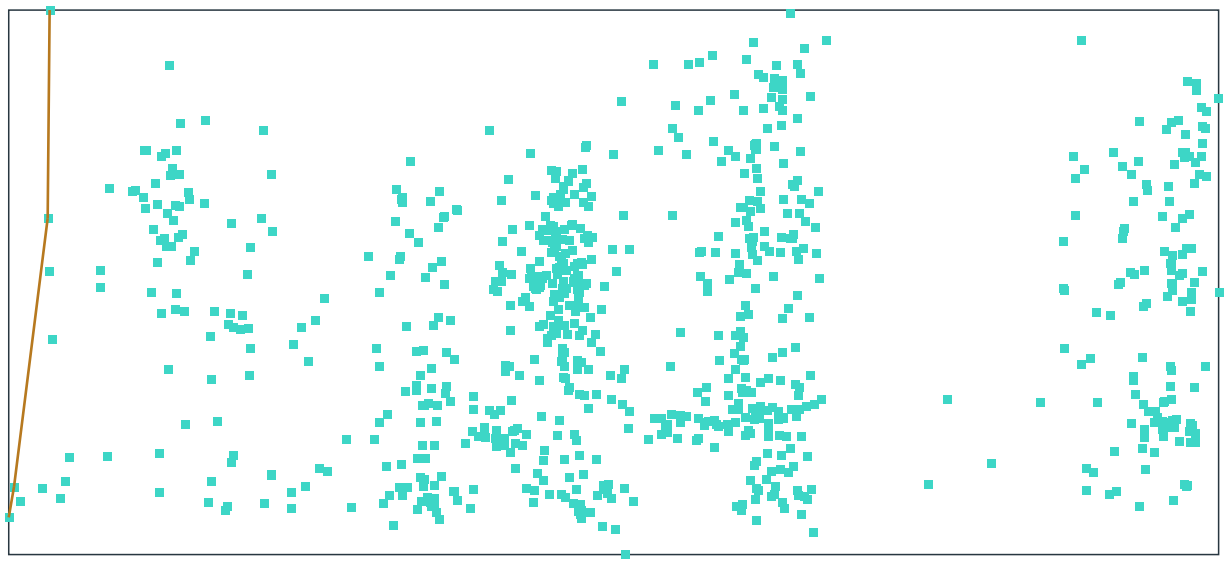


Mean Avail, every mode x arch

Mean Avail, every mode x arch

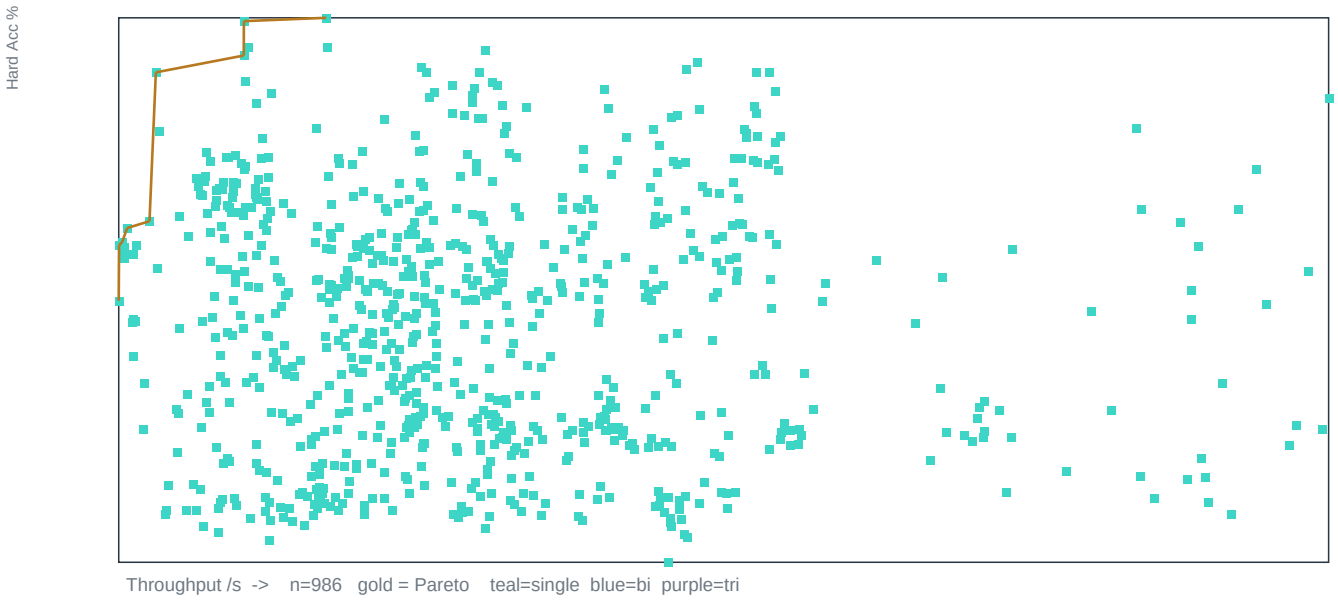
	cameralx5
MeshBP	23
Mesh[T]	20
Mesh[T]Alt	17
Mesh[T]Chain	23
Mesh[T][S]	27
Mesh[T][S][FP]	27
Mesh[T][S]Sparse	36
Step[T]Alt	17
Step[T][S]	24
Step[T][S][FP]	24
Step[T][S][HP]	23
Step[T][S][HP]Async	24
Step[T][S][L]	30
Step[T][S][L]Cache	30
Step[T][S]Sparse	24
[T]Alt	17
[T][S]	28
[T][S][FP]	27
[T][S][HP]	27
[T][S][HP]Async	27
[T][S][L]	35
[T][S][L]Cache	36
[T][S]Sparse	36
sgd	24
step_sgd	27
step_tween	23
step_tween_chain	26
tween	21
tween_chain	23

Pillars - Availability vs hard Acc

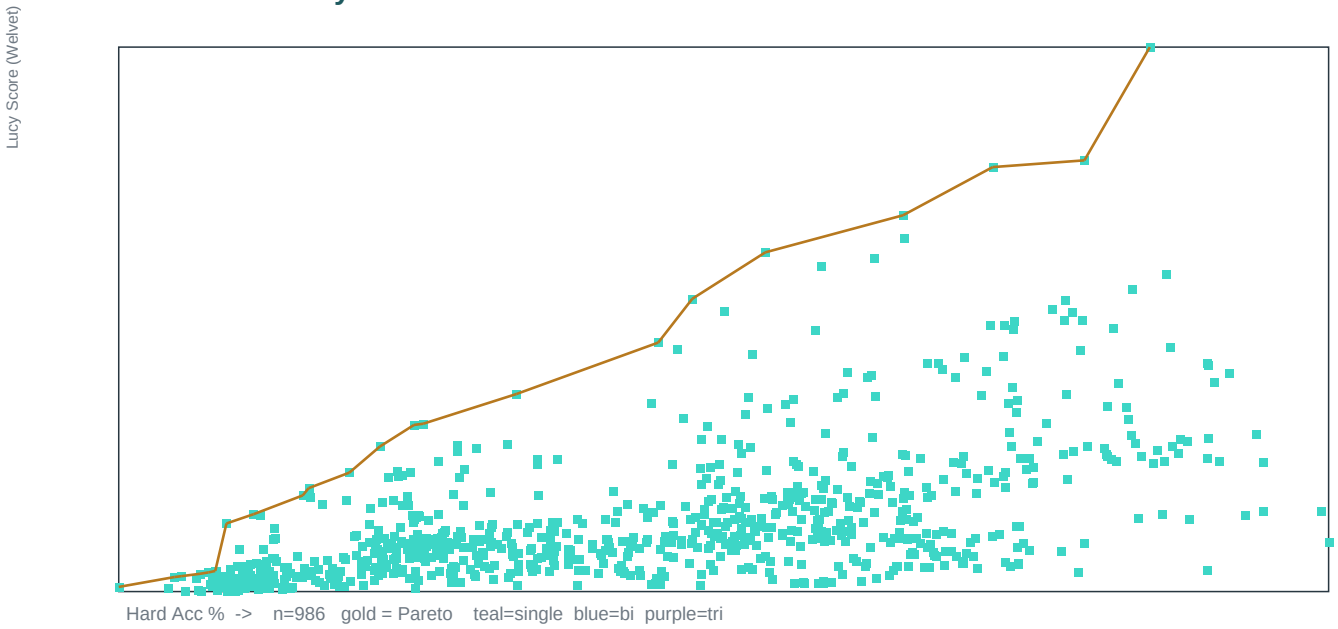



Availability % -> n=986 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

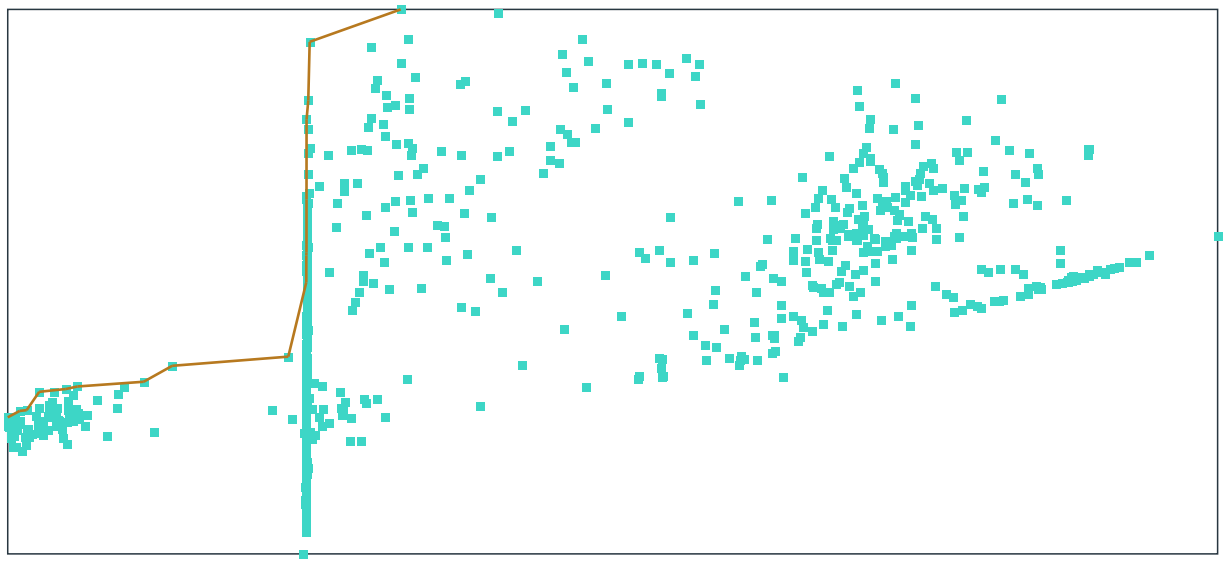
Pillars - Throughput vs hard Acc



Pareto - hard Acc vs Lucy Score

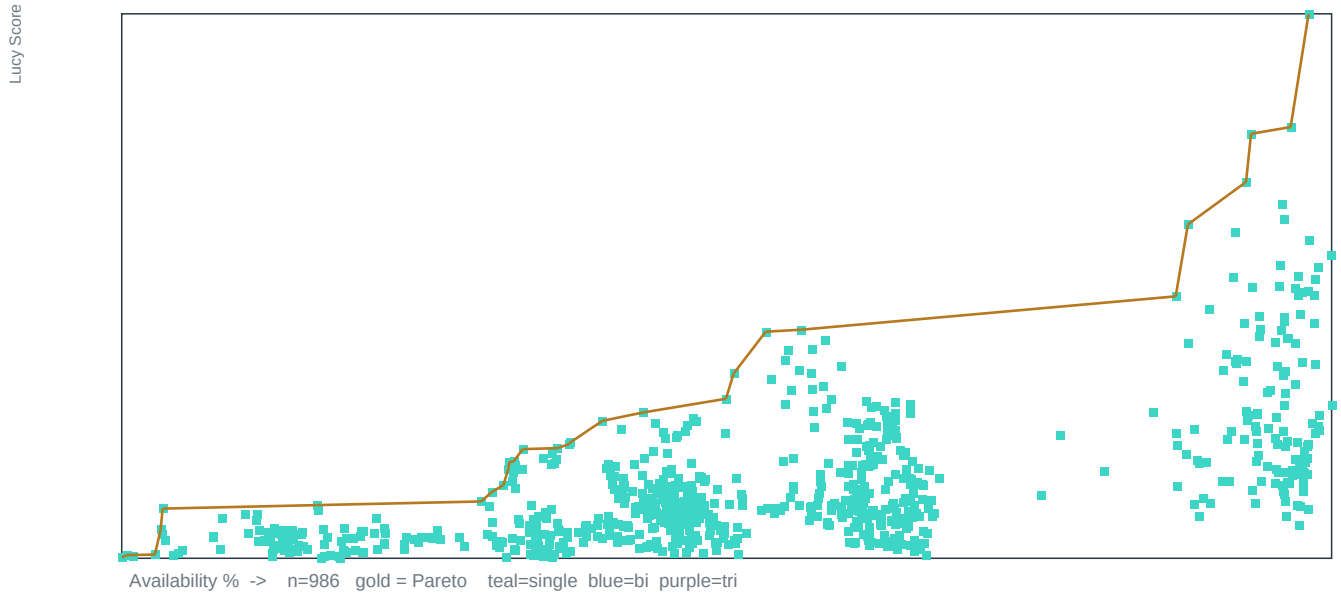


SoftAcc (serve-confidence) vs hard Acc




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

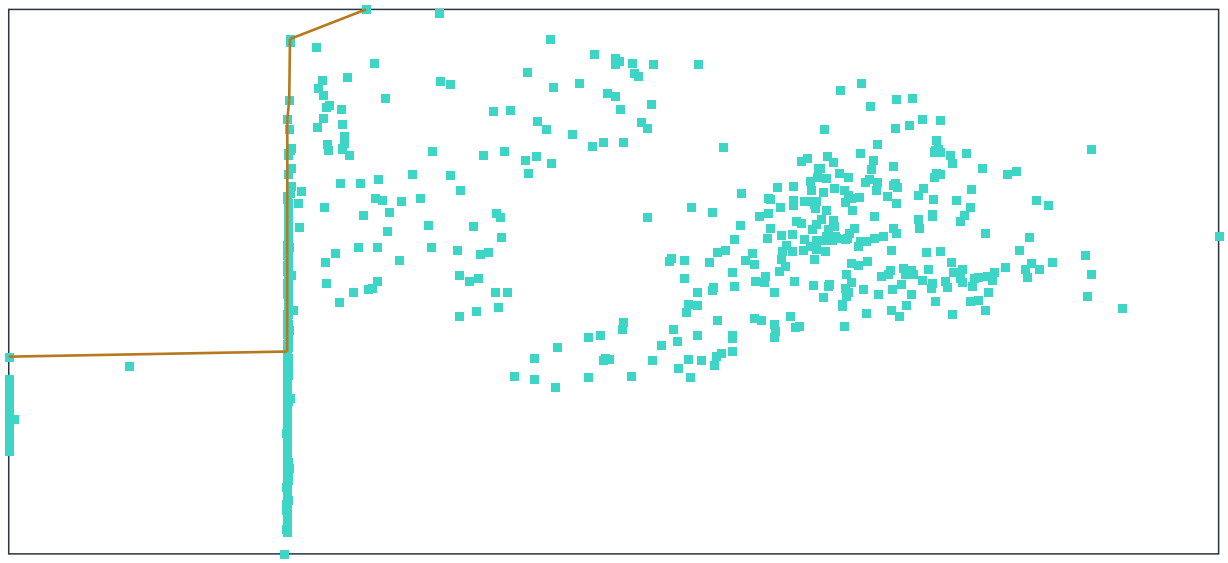
Avail vs Lucy Score (duty clock)



Pillars - Throughput vs Availability



AdaptPct vs hard Acc



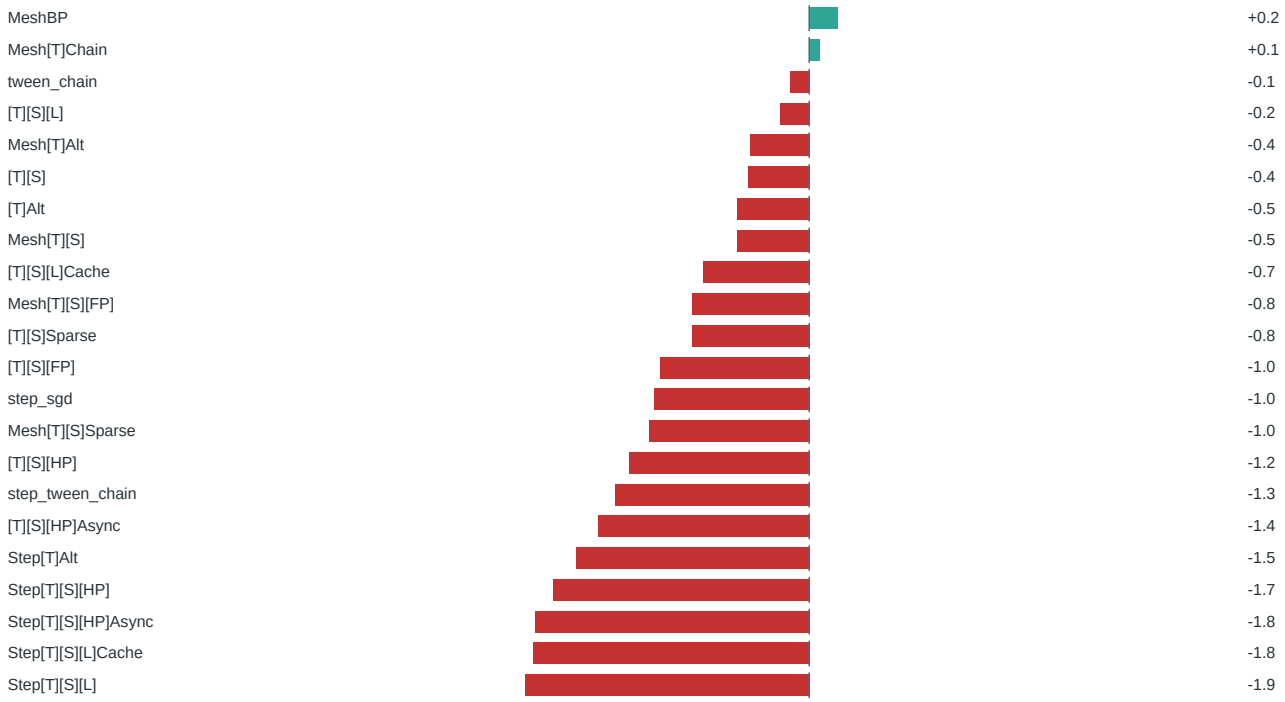

AdaptPct % -> n=986 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

vs sgd - matched dtype x format x arch

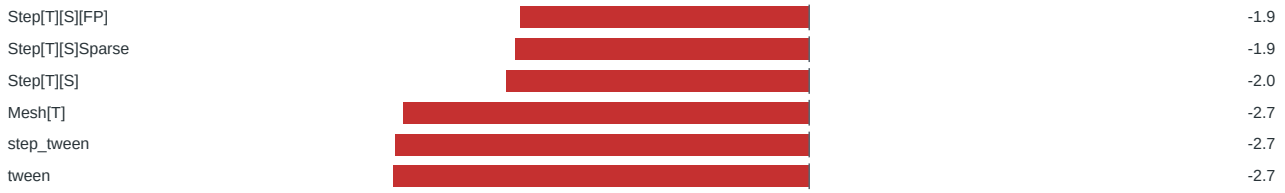
AccDelta is the honest column. ScoreDelta is usually Availability (duty clock), not a better chain rule. Acc win = AccDelta > 0.5. Score win = ScoreDelta > 1. Baseline is discovered from the board, not a frozen StepBP list.

mode	n	AccD	Acc win%	SoftD	AvailD	ThruD	ScoreD	Score win%
MeshBP	34	+0.2	26	-0.1	-0.7	-39	-0.6	0
Mesh[T]Chain	34	+0.1	18	-0.0	-0.7	-43	-0.7	0
tween_chain	34	-0.1	21	-0.2	-0.5	-30	-0.7	3
[T][S][L]	34	-0.2	38	-1.2	+11.0	+183	+4.9	82
Mesh[T]Alt	34	-0.4	38	-1.0	-7.0	-137	-2.8	0
[T][S]	34	-0.4	47	-2.1	+3.9	+34	+0.9	59
[T]Alt	34	-0.5	41	-1.2	-6.8	-130	-2.7	0
Mesh[T][S]	34	-0.5	53	-2.0	+3.7	+13	+0.4	56
[T][S][L]Cache	34	-0.7	32	-2.1	+12.7	+225	+5.4	88
Mesh[T][S][FP]	34	-0.8	38	-2.8	+3.8	+17	+0.1	41
[T][S]Sparse	34	-0.8	35	-2.8	+12.5	+224	+4.8	85
[T][S][FP]	34	-1.0	35	-2.7	+3.7	+19	+0.1	35
step_sgd	34	-1.0	9	-1.4	+3.2	+53	+0.2	32
Mesh[T][S]Sparse	34	-1.0	29	-2.7	+12.5	+217	+4.3	74
[T][S][HP]	34	-1.2	32	-2.8	+3.7	+23	-0.2	32
step_tween_chain	34	-1.3	12	-1.7	+2.8	+28	-0.4	12
[T][S][HP]Async	34	-1.4	21	-2.7	+3.5	+16	-0.4	21
Step[T]Alt	34	-1.5	32	-3.0	-7.1	-142	-3.0	0
Step[T][S][HP]	34	-1.7	24	-3.0	-0.8	-61	-1.8	0
Step[T][S][HP]Async	34	-1.8	12	-3.0	-0.1	-52	-1.8	0
Step[T][S][L]Cache	34	-1.8	26	-3.0	+6.3	+65	+0.1	35
Step[T][S][L]	34	-1.9	18	-3.0	+6.4	+70	+0.0	41
Step[T][S][FP]	34	-1.9	9	-3.0	-0.1	-51	-1.8	0
Step[T][S]Sparse	34	-1.9	12	-3.0	-0.1	-54	-1.9	0
Step[T][S]	34	-2.0	9	-3.0	+0.2	-32	-1.7	0
Mesh[T]	34	-2.7	3	-3.0	-3.3	-82	-2.7	0
step_tween	34	-2.7	0	-3.0	-0.6	-34	-2.2	0
tween	34	-2.7	6	-3.0	-3.1	-69	-2.6	0

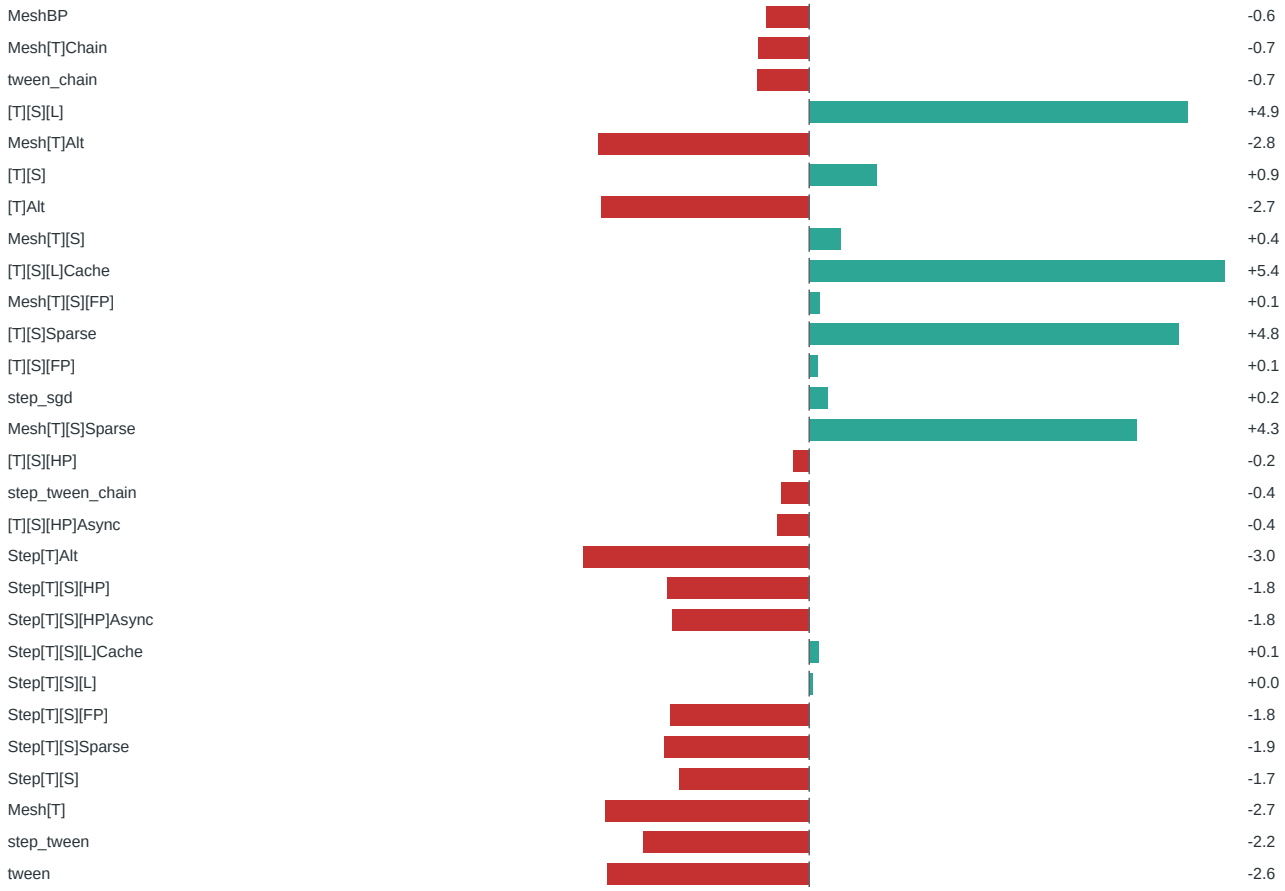
mean AccD vs sgd



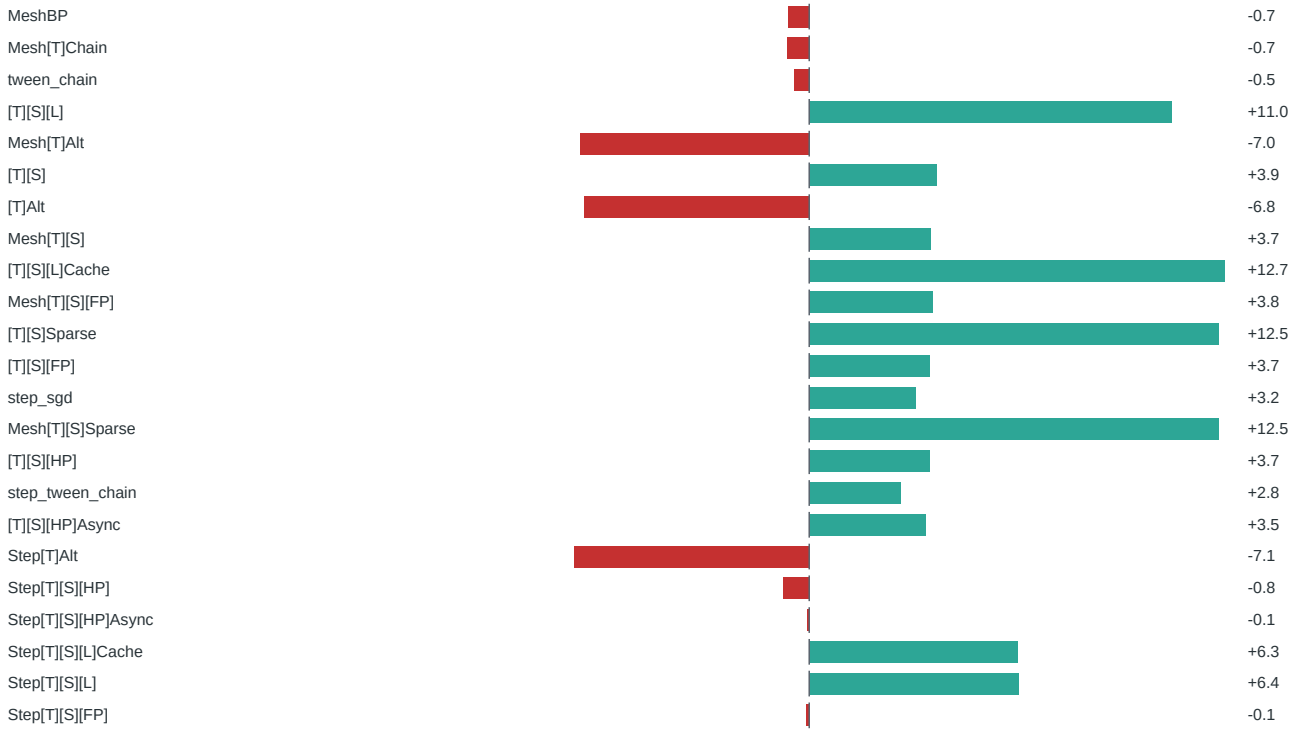
mean AccD vs sgd



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

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

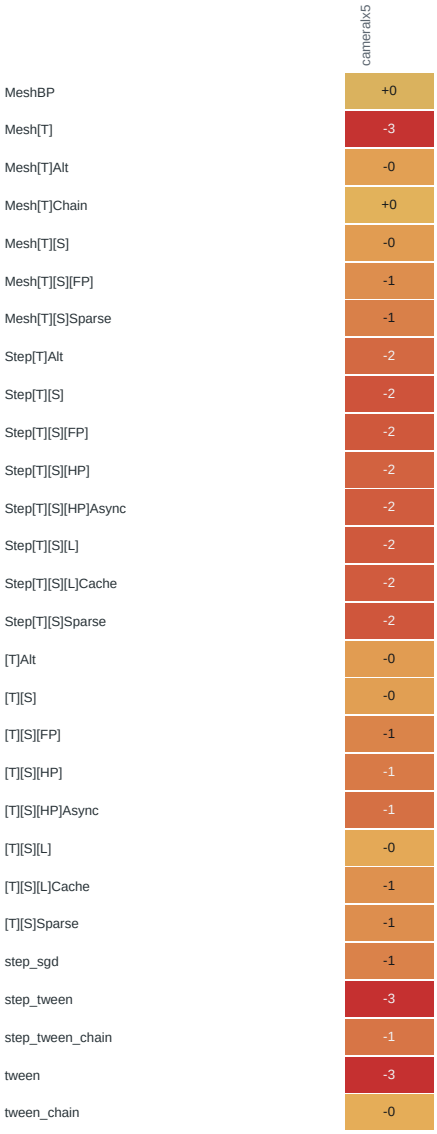
AvailD vs sgd, every mode x dtype (cols 25-34)

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

	uint16	uint2	uint3	uint32	uint4	uint5	uint6	uint64	uint8	uintptr
MeshBP	-0	-1	-1	-0	-1	-1	+0	-1	-1	-1
Mesh[T]	-4	-4	-4	-3	-4	-3	-3	-4	-4	-4
Mesh[T]Alt	-9	-8	-9	-8	-9	-9	-8	-9	-9	-8
Mesh[T]Chain	-1	-0	-1	-1	-1	-1	+0	-1	-2	-1
Mesh[T][S]	+3	+4	+4	+3	+3	+4	+5	+3	+2	+4
Mesh[T][S][FP]	+4	+4	+4	+3	+4	+4	+5	+3	+2	+4
Mesh[T][S]Sparse	+12	+13	+12	+12	+12	+13	+13	+11	+12	+12
Step[T]Alt	-7	-7	-8	-8	-7	-8	-7	-7	-8	-7
Step[T][S]	-1	+1	+0	-0	+0	+0	+1	-0	-1	+0
Step[T][S][FP]	+0	+0	-0	-0	-1	+0	+0	+0	-1	-0
Step[T][S][HP]	-1	-0	-1	-0	-1	-1	-0	-1	-2	-1
Step[T][S][HP]Async	-1	+0	+0	-0	-0	+0	+0	-0	-2	-0
Step[T][S][L]	+6	+6	+6	+7	+7	+6	+6	+6	+6	+6
Step[T][S][L]Cache	+6	+6	+6	+6	+6	+6	+6	+6	+6	+6
Step[T][S]Sparse	-1	-0	-0	-0	-0	+0	+1	-1	-1	-0
[T]Alt	-9	-8	-8	-9	-9	-9	-8	-9	-9	-8
[T][S]	+3	+4	+4	+4	+4	+4	+5	+3	+3	+4
[T][S][FP]	+4	+4	+4	+4	+4	+4	+5	+3	+3	+3
[T][S][HP]	+4	+4	+4	+3	+4	+4	+5	+4	+2	+4
[T][S][HP]Async	+3	+4	+4	+4	+3	+4	+5	+3	+2	+3
[T][S][L]	+11	+11	+10	+11	+11	+10	+11	+11	+10	+11
[T][S][L]Cache	+12	+13	+12	+13	+13	+12	+13	+12	+12	+13
[T][S]Sparse	+12	+13	+12	+12	+12	+13	+13	+12	+12	+12
step_sgd	+3	+4	+3	+3	+3	+3	+3	+3	+3	+3
step_tween	-1	-1	-1	+0	-0	-1	+0	-1	-1	-0
step_tween_chain	+3	+3	+3	+3	+3	+3	+4	+3	+2	+3
tween	-3	-3	-3	-3	-3	-3	-2	-4	-3	-3
tween_chain	-1	-0	-0	-0	-0	-0	+0	-1	-1	-1

AccD vs sgd, every mode x arch

AccD vs sgd, every mode x arch



Family collapse - Step* vs non-Step

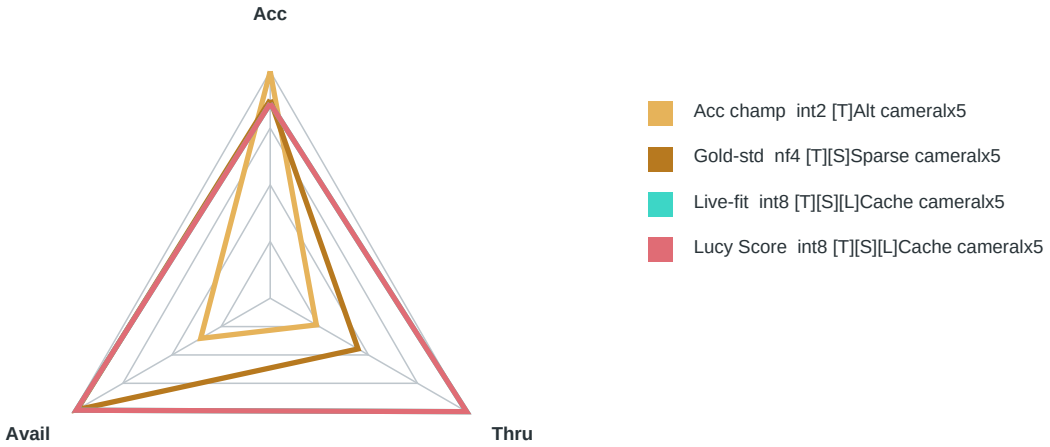
Step* is a 1D pipe (one sample enters layer 0 per tick; output is the sample that entered depth ticks ago). Non-Step of the same family is a full-chain update. AccD is a real scheduler split, not leftover warm-up forwards.

step	plain	n	mean |AccD|
Step[T]Alt	[T]Alt	34	2.90
Step[T][S]	[T][S]	34	1.99
Step[T][S][FP]	[T][S][FP]	34	2.39
Step[T][S][HP]	[T][S][HP]	34	2.50
Step[T][S][HP]Async	[T][S][HP]Async	34	1.95
Step[T][S][L]	[T][S][L]	34	2.02
Step[T][S][L]Cache	[T][S][L]Cache	34	2.42
Step[T][S]Sparse	[T][S]Sparse	34	2.58
step_sgd	sgd	34	1.38
step_tween	tween	34	0.77
step_tween_chain	tween_chain	34	1.53

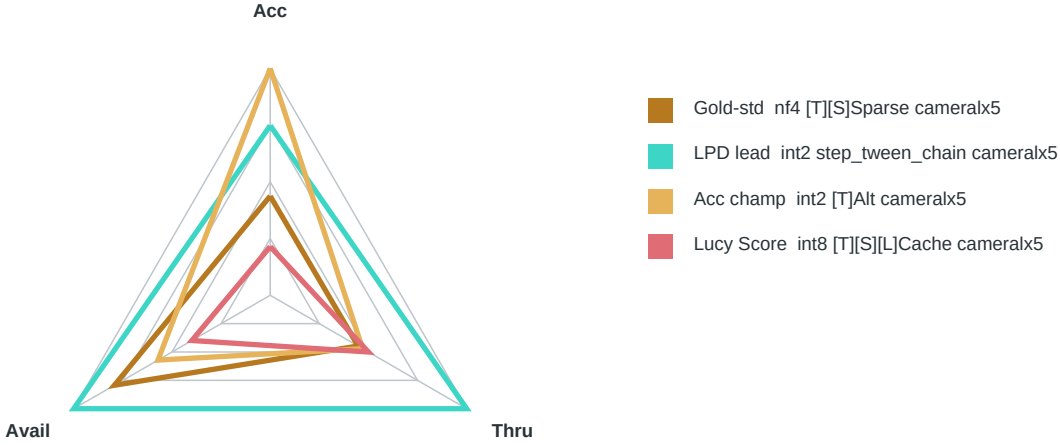
Consciousness - Acc, Throughput, Availability

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 int2|none|[T]Alt|cameralx5|simd Acc 10.3 Thru 216 Avail 13.2% 23.5 KiB (RAM reference)
Lucy Score champ (T x Avail x Acc) int8|none|[T][S][L]Cache|cameralx5|simd Score 30.0 Acc 8.9 Soft 4 94.1 KiB
Live-fit champ (best Q) int8|none|[T][S][L]Cache|cameralx5|simd Acc 8.9 Thru 920 Avail 36.7% 94.1 KiB
Gold-std (2+ pillars, Acc keep >= 80%, then smallest then fastest): nf4|none|[T][S]Sparse|cameralx5|simd mode [T][S]Sparse Acc 9.0 Thru 411 47.0 KiB
Board fastest int8|none|[T][S][L]Cache|cameralx5|simd Thru 920 (traps may own this) Best availability int|none|[T][S][L]Cache|cameralx5|simd 37.2%
Learner Thru peak 920 learner Avail peak 37.2%

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
[T][S]Sparse	2	9.0	47.0	446	nf4 [T][S]Sparse cameralx5 / uint [T][S]Sparse cameralx5
[T][S][L]	2	9.8	70.6	509	fp6 [T][S][L] cameralx5 / uint64 [T][S][L] cameralx5

Mode	n	Acc	KiB	Thru	Cell
Mesh[T][S]Sparse	1	8.5	70.6	257	uint6 Mesh[T][S]Sparse cameralx5
[T][S][L]Cache	5	9.0	94.1	920	int8 [T][S][L]Cache cameralx5

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

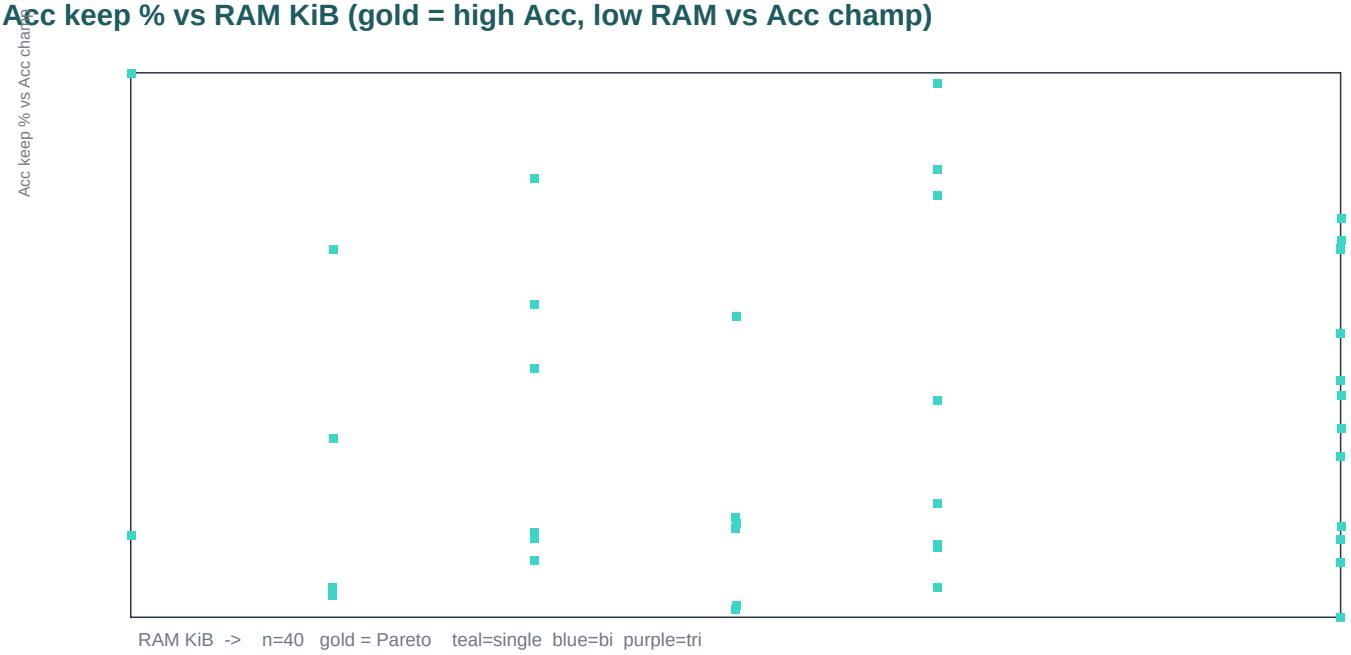
Band	Cell	Acc%	Thru%	Avail%	Q%	RAM%	xSmall	LPD	Acc	Thru	KiB
-	int2 step_tween_chain cameralx5	75	50	62	61	100	1.0	0.61	7.7	460	23.5
acc	int2 [T]Alt cameralx5	100	24	35	44	100	1.0	0.44	10.3	216	23.5
-	uint4 Mesh[T][S]Sparse cameralx5	75	56	98	74	200	0.5	0.37	7.7	516	47.1
keep	nf4 [T][S]Sparse cameralx5	87	45	98	73	200	0.5	0.36	9.0	411	47.0
acc	int4 [T][S][FP] cameralx5	84	52	67	66	200	0.5	0.33	8.7	478	47.0
-	int4 Mesh[T][S][FP] cameralx5	75	51	67	63	200	0.5	0.32	7.7	468	47.0
acc	uint4 [T][S][HP]Async cameralx5	94	36	74	63	200	0.5	0.31	9.7	328	47.1
-	int3 tween_chain cameralx5	72	19	65	45	150	0.7	0.30	7.4	176	35.3
-	int3 MeshBP cameralx5	72	18	63	44	150	0.7	0.29	7.4	169	35.3
-	int4 tween_chain cameralx5	73	43	55	56	200	0.5	0.28	7.6	397	47.0
-	uint5 [T][S]Sparse cameralx5	71	31	99	60	250	0.4	0.24	7.3	282	58.9
keep	int8 [T][S][L]Cache cameralx5	86	100	99	95	400	0.2	0.24	8.9	920	94.1
-	int5 Mesh[T][S]Sparse cameralx5	71	29	99	59	250	0.4	0.24	7.3	267	58.8
acc	uint3 Mesh[T]Alt cameralx5	90	10	42	34	150	0.7	0.23	9.3	97	35.3
acc	uint3 [T]Alt cameralx5	80	11	43	33	150	0.7	0.22	8.3	99	35.3
keep	uint8 [T][S][L]Cache cameralx5	81	85	98	88	400	0.2	0.22	8.3	785	94.1
-	int8 [T][S]Sparse cameralx5	73	94	96	87	400	0.2	0.22	7.6	869	94.1
keep	uint6 Mesh[T][S]Sparse cameralx5	82	28	99	61	300	0.3	0.20	8.5	257	70.6
acc	uint5 Mesh[T][S][FP] cameralx5	87	19	75	50	250	0.4	0.20	9.0	177	58.9
keep	fp6 [T][S][L] cameralx5	95	24	92	59	300	0.3	0.20	9.8	217	70.6

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

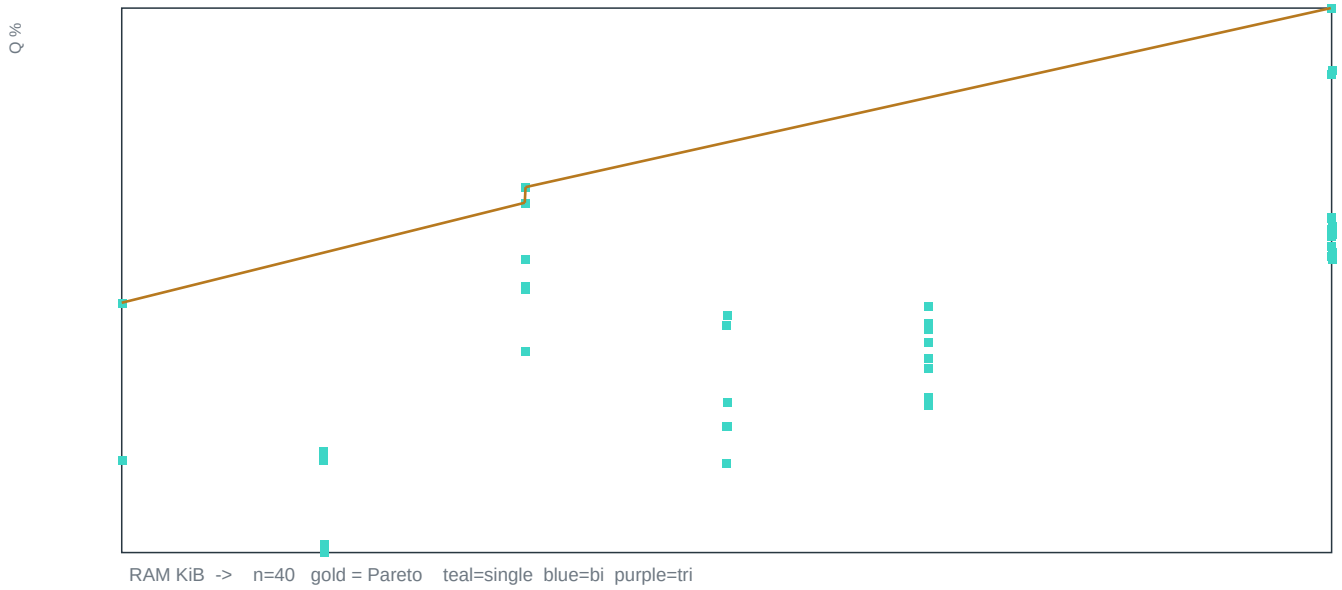
Band	Cell	Acc%	Thru%	Avail%	Q%	LPD	Thru	Avail
keep	int8 [T][S][L]Cache cameralx5	86	100	99	95	0.24	920	36.7
keep	uint8 [T][S][L]Cache cameralx5	81	85	98	88	0.22	785	36.4
-	int8 [T][S]Sparse cameralx5	73	94	96	87	0.22	869	35.5
keep	uint16 [T][S][L]Cache cameralx5	87	58	99	79	0.10	532	36.7
keep	int32 [T][S][L]Cache cameralx5	84	56	100	78	0.05	517	37.2
-	uint32 [T][S][L]Cache cameralx5	79	58	99	77	0.05	535	36.9
-	uint16 [T][S]Sparse cameralx5	78	58	98	76	0.10	531	36.5
-	int16 [T][S][L]Cache cameralx5	80	56	99	76	0.09	511	36.9
-	uint32 Mesh[T][S]Sparse cameralx5	79	56	97	75	0.05	511	36.1
keep	uint64 [T][S][L] cameralx5	80	55	96	75	0.02	509	35.6

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

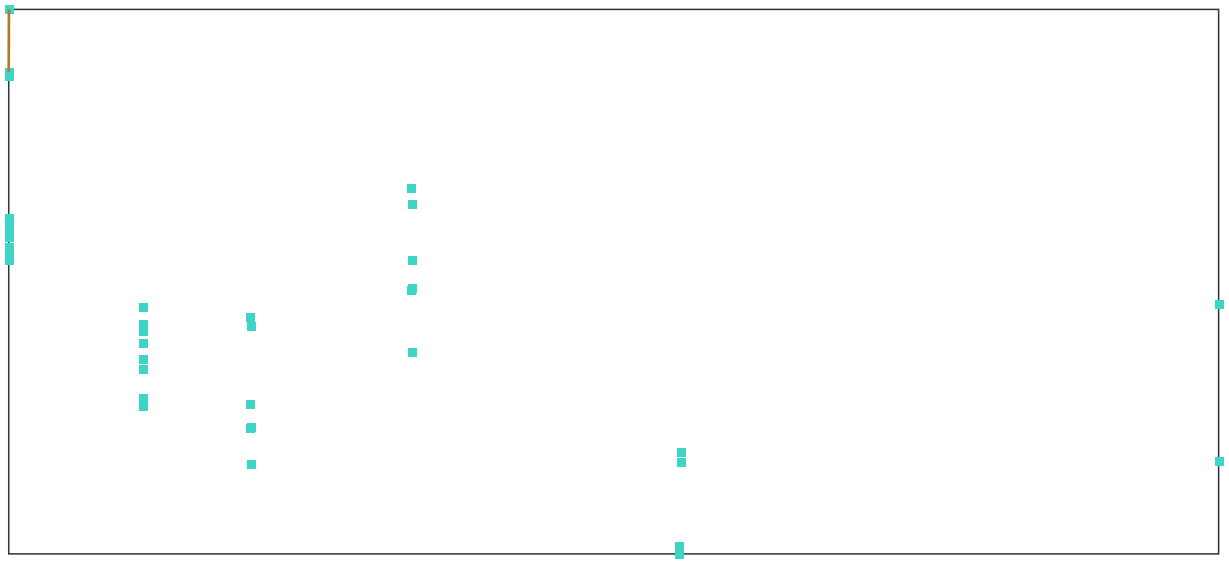
Acc keep % vs RAM KiB (gold = high Acc, low RAM vs Acc champ)



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



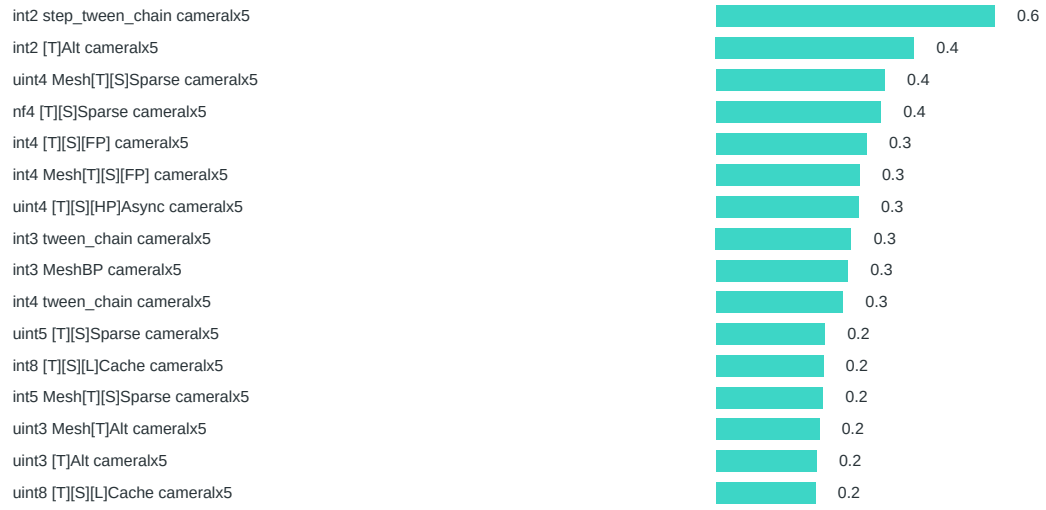
Q% vs shrink vs Acc champ (gold = upper right)



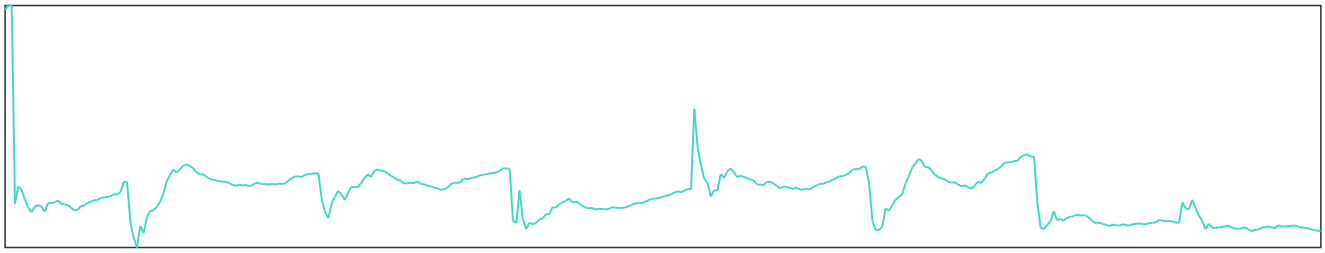
times smaller than Acc champ -> n=40 gold = Pareto teal=single blue=bi purple=tri

Q %

Top Lucy density (LPD)

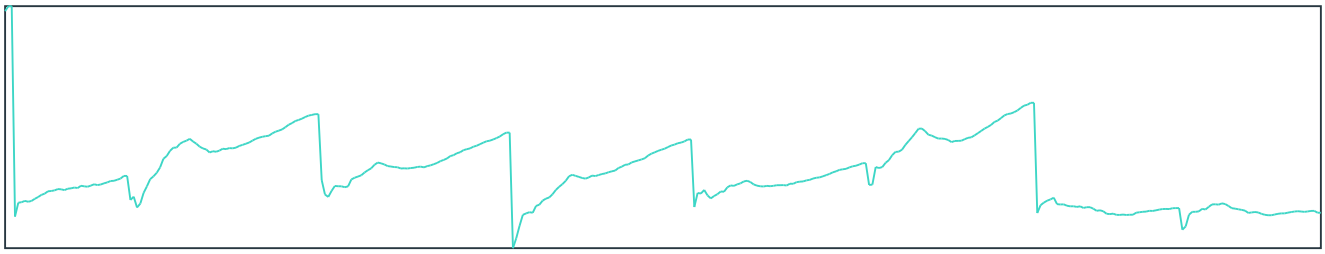


Live pulse (Score)



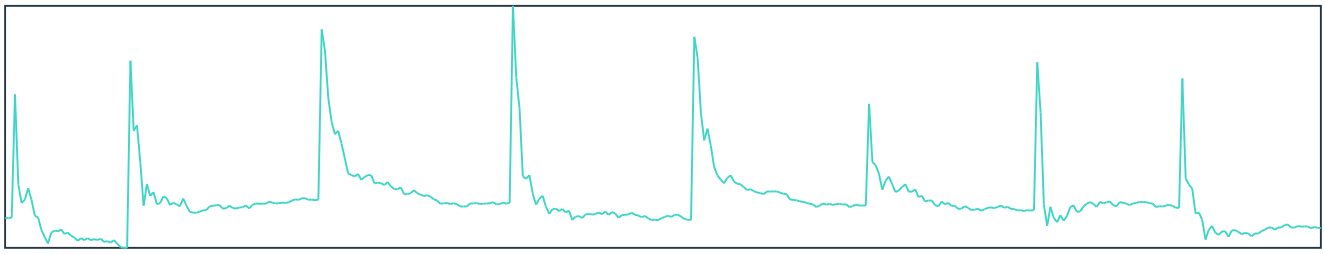
n=400 min=0.26 max=3.48

Live pulse (SoftAcc)



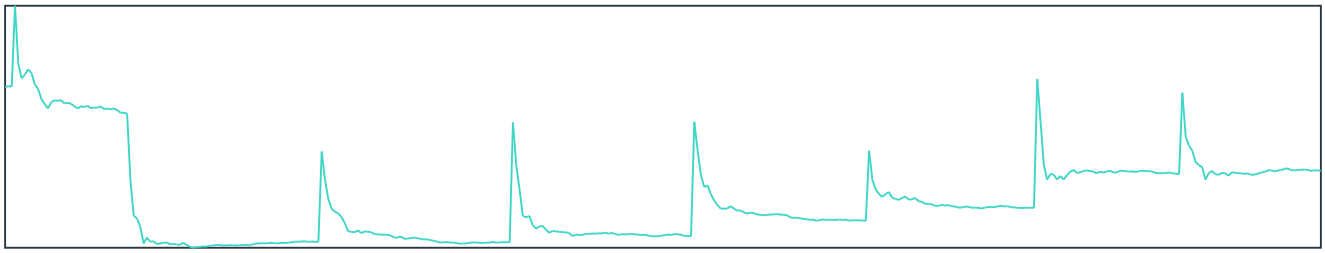
n=400 min=1.54 max=1.55

Live pulse (Availability)



n=400 min=23.36 max=31.13

Live pulse (Throughput)



n=400 min=122.39 max=255.83

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