# 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 15:48:25  -  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  -  cameralx3  -  tinyshakespeare  -  4096 windows  -  seq 32  -  causal MHA  -  A->B->A2  -  SIMD

## Lucy champions (this tide)

| Axis | Cell | Score | Soft | Acc | Thru | Avail |
|---|---|---|---|---|---|---|
| hard acc | int\|none\|sgd\|tricameral\|simd | 2.94 | 6.1 | 6.1 | 228.2 | 20.9 |
| throughput | float32\|none\|[T][S][L]Cache\|tricameral\|simd | 10.22 | 1.0 | 2.7 | 1117.1 | 34.2 |
| availability | int64\|none\|[T][S][L]Cache\|tricameral\|simd | 7.12 | 2.5 | 3.4 | 585.4 | 35.8 |
| lucy score | int4\|none\|[T][S][L]\|tricameral\|simd | 31.13 | 1.5 | 10.4 | 936.1 | 32.1 |
| mobile score (trap) | int2\|none\|[T][S]Sparse\|tricameral\|simd | 23.19 | 4.3 | 7.4 | 957.8 | 32.6 |
| acc/sec | int4\|none\|[T][S][L]\|tricameral\|simd | 31.13 | 1.5 | 10.4 | 936.1 | 32.1 |

## Lucy axis champions (this tide)

| Axis | Mode | DType | Arch | Value |
|---|---|---|---|---|
| hard_acc | [T]Alt | uint3 | tricameralx3 | 11.43 |
| throughput | [T][S][L]Cache | float32 | tricameralx3 | 1117.07 |
| availability | [T][S][L]Cache | int64 | tricameralx3 | 35.80 |
| score | [T][S][L] | int4 | tricameralx3 | 31.13 |
| soft_acc | sgd | int | tricameralx3 | 6.07 |
| acc_thru | [T][S][L] | int4 | tricameralx3 | 97.00 |
| realtime | [T][S][L]Cache | float32 | tricameralx3 | 381.80 |
| adapt | sgd | complex128 | tricameralx3 | 6.42 |
| keep_learn | [T][S][L]Cache | int8 | tricameralx3 | 11.09 |
| acc_per_sec | [T][S][L] | int4 | tricameralx3 | 1.46 |
| consistency | [T][S][L]Cache | float64 | tricameralx3 | 11.11 |
| stability | sgd | fp4 | tricameralx3 | 100.00 |
| mobile_score | [T][S]Sparse | int2 | tricameralx3 | 1103.37 |
| lpd | [T][S][L] | int4 | tricameralx3 | 0.71 |
| mspeed | [T][S][L] | int4 | tricameralx3 | 1.00 |
| mavail | Mesh[T][S]Sparse | uint | tricameralx3 | 1.00 |
| mix | [T][S][L] | int4 | tricameralx3 | 0.95 |
| gold_std | [T][S][L] | int4 | tricameralx3 | 43.05 |

## Best settings per train mode

| Mode | DType | Format | Score | Soft | Acc | Avail | n |
|---|---|---|---|---|---|---|---|
| [T][S][L] | int4 | none | 31.1 | 1.5 | 10.4 | 32.1 | 34 |
| [T][S][L]Cache | int8 | none | 28.3 | 4.2 | 7.9 | 34.4 | 34 |
| [T][S]Sparse | int2 | none | 23.2 | 4.3 | 7.4 | 32.6 | 34 |
| Mesh[T][S]Sparse | int4 | none | 19.2 | 2.0 | 6.0 | 33.1 | 34 |
| [T][S] | int8 | none | 15.9 | 2.2 | 9.6 | 25.0 | 34 |
| Mesh[T][S] | int8 | none | 15.8 | 2.4 | 9.7 | 25.0 | 34 |
| [T][S][FP] | int8 | none | 13.8 | 3.1 | 8.7 | 24.6 | 34 |
| [T][S][HP] | uint8 | none | 12.9 | 3.1 | 8.6 | 25.4 | 34 |
| Mesh[T][S][FP] | int8 | none | 12.3 | 3.2 | 8.1 | 24.3 | 34 |
| step_tween_chain | int8 | none | 10.8 | 4.2 | 7.2 | 23.9 | 34 |
| Step[T][S][L]Cache | float32 | none | 10.6 | 1.5 | 5.0 | 27.9 | 34 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| [T][S][HP]Async | uint8 | none | 10.5 | 4.2 | 7.0 | 25.4 | 34 |
| Step[T][S][L] | bfloat16 | none | 10.2 | 1.5 | 6.7 | 28.2 | 34 |
| step_sgd | uint8 | none | 9.5 | 4.2 | 6.7 | 24.7 | 34 |
| Mesh[T]Chain | int8 | none | 8.2 | 4.7 | 7.7 | 20.7 | 34 |
| Step[T][S] | float32 | none | 7.1 | 1.5 | 6.4 | 21.0 | 34 |
| Step[T][S][FP] | float32 | none | 6.9 | 1.5 | 6.3 | 20.9 | 34 |
| Step[T][S][HP] | float32 | none | 6.6 | 1.5 | 6.3 | 20.6 | 34 |
| MeshBP | int2 | none | 6.5 | 5.0 | 7.6 | 18.9 | 34 |
| tween_chain | uint8 | none | 6.4 | 4.6 | 6.4 | 21.2 | 34 |
| Step[T][S]Sparse | float32 | none | 6.3 | 1.5 | 5.6 | 21.2 | 34 |
| Step[T][S][HP]Async | bfloat16 | none | 6.2 | 1.5 | 8.1 | 20.9 | 34 |
| sgd | int8 | none | 5.5 | 3.7 | 5.5 | 19.7 | 34 |
| step_tween | bfloat16 | none | 4.2 | 1.5 | 6.0 | 20.0 | 34 |
| Step[T]Alt | float32 | none | 3.3 | 1.5 | 6.5 | 14.7 | 34 |
| Mesh[T] | float32 | none | 3.1 | 1.5 | 3.8 | 18.2 | 34 |
| tween | bfloat16 | none | 3.0 | 1.5 | 5.4 | 17.9 | 34 |
| [T]Alt | float32 | none | 2.9 | 0.4 | 2.7 | 20.0 | 34 |
| Mesh[T]Alt | float32 | none | 2.8 | 0.2 | 2.7 | 19.8 | 34 |

## Best dtype per mode

| Mode | Winner dtype | Score | Soft | Acc |
|---|---|---|---|---|
| [T][S][L] | int4 | 31.1 | 1.5 | 10.4 |
| [T][S][L]Cache | int8 | 28.3 | 4.2 | 7.9 |
| [T][S]Sparse | int2 | 23.2 | 4.3 | 7.4 |
| Mesh[T][S]Sparse | int4 | 19.2 | 2.0 | 6.0 |
| [T][S] | int8 | 15.9 | 2.2 | 9.6 |
| Mesh[T][S] | int8 | 15.8 | 2.4 | 9.7 |
| [T][S][FP] | int8 | 13.8 | 3.1 | 8.7 |
| [T][S][HP] | uint8 | 12.9 | 3.1 | 8.6 |
| Mesh[T][S][FP] | int8 | 12.3 | 3.2 | 8.1 |
| step_tween_chain | int8 | 10.8 | 4.2 | 7.2 |
| Step[T][S][L]Cache | float32 | 10.6 | 1.5 | 5.0 |
| [T][S][HP]Async | uint8 | 10.5 | 4.2 | 7.0 |
| Step[T][S][L] | bfloat16 | 10.2 | 1.5 | 6.7 |
| step_sgd | uint8 | 9.5 | 4.2 | 6.7 |
| Mesh[T]Chain | int8 | 8.2 | 4.7 | 7.7 |
| Step[T][S] | float32 | 7.1 | 1.5 | 6.4 |
| Step[T][S][FP] | float32 | 6.9 | 1.5 | 6.3 |
| Step[T][S][HP] | float32 | 6.6 | 1.5 | 6.3 |
| MeshBP | int2 | 6.5 | 5.0 | 7.6 |
| tween_chain | uint8 | 6.4 | 4.6 | 6.4 |
| Step[T][S]Sparse | float32 | 6.3 | 1.5 | 5.6 |
| Step[T][S][HP]Async | bfloat16 | 6.2 | 1.5 | 8.1 |
| sgd | int8 | 5.5 | 3.7 | 5.5 |
| step_tween | bfloat16 | 4.2 | 1.5 | 6.0 |
| Step[T]Alt | float32 | 3.3 | 1.5 | 6.5 |
| Mesh[T] | float32 | 3.1 | 1.5 | 3.8 |
| tween | bfloat16 | 3.0 | 1.5 | 5.4 |
| [T]Alt | float32 | 2.9 | 0.4 | 2.7 |
| Mesh[T]Alt | float32 | 2.8 | 0.2 | 2.7 |

## Best mode per dtype

| DType | Winner mode | Score | Soft | Acc |
|---|---|---|---|---|
| int4 | [T][S][L] | 31.1 | 1.5 | 10.4 |
| int8 | [T][S][L]Cache | 28.3 | 4.2 | 7.9 |
| int2 | [T][S]Sparse | 23.2 | 4.3 | 7.4 |
| float32 | [T][S][L] | 21.8 | 5.4 | 5.8 |
| uint8 | [T][S][L]Cache | 21.7 | 4.2 | 6.8 |
| uint32 | [T][S][L]Cache | 16.5 | 4.1 | 7.6 |
| uint16 | [T][S][L]Cache | 15.8 | 4.4 | 7.4 |
| float64 | [T][S][L] | 15.3 | 5.4 | 5.9 |
| uint64 | Mesh[T][S]Sparse | 14.5 | 2.7 | 7.6 |
| int32 | [T][S][L]Cache | 14.3 | 4.5 | 7.6 |
| fp8e5m2 | [T][S][L] | 13.6 | 4.4 | 7.9 |
| uint | Mesh[T][S]Sparse | 13.5 | 2.8 | 8.2 |
| bfloat16 | [T][S][L] | 13.2 | 5.3 | 5.7 |
| int16 | Mesh[T][S]Sparse | 13.1 | 2.3 | 7.1 |
| uintptr | [T][S]Sparse | 13.0 | 2.4 | 7.6 |
| float16 | [T][S][L] | 11.4 | 5.6 | 6.2 |
| uint4 | [T][S][L]Cache | 10.9 | 1.5 | 5.1 |
| int64 | [T][S][L] | 10.1 | 5.3 | 5.7 |
| int3 | [T][S]Sparse | 9.2 | 2.0 | 8.3 |
| complex64 | [T][S][L] | 9.0 | 5.5 | 6.1 |
| ternary | [T][S][L]Cache | 8.2 | 1.5 | 2.6 |
| complex128 | [T][S][L] | 8.0 | 4.8 | 5.4 |
| int | [T][S][L] | 7.8 | 4.9 | 5.4 |
| uint5 | [T][S]Sparse | 7.7 | 2.3 | 7.8 |
| fp8e4m3 | [T][S][L]Cache | 7.6 | 1.9 | 5.0 |
| fp4 | [T][S]Sparse | 7.3 | 1.5 | 3.0 |
| int5 | Mesh[T][S]Sparse | 7.1 | 2.3 | 7.4 |
| nf4 | Mesh[T][S]Sparse | 6.9 | 1.8 | 4.7 |
| uint6 | Mesh[T][S]Sparse | 6.9 | 2.4 | 7.6 |
| fp6 | Mesh[T][S]Sparse | 6.7 | 2.6 | 7.7 |
| binary | [T][S][L]Cache | 6.6 | 1.5 | 2.0 |
| int6 | [T][S][L] | 6.6 | 2.9 | 8.9 |
| uint3 | [T][S][L] | 5.5 | 1.5 | 5.3 |
| uint2 | [T][S][L]Cache | 5.2 | 1.5 | 2.7 |

## Leaderboard (Lucy Score)

| # | Cell | Score | Soft | Acc | Thru | Avail |
|---|---|---|---|---|---|---|
| 1 | int4\|none\|[T][S][L]\|tricameral\|simd | 31.1 | 1.5 | 10.4 | 936.1 | 32.1 |
| 2 | int8\|none\|[T][S][L]Cache\|tricameral\|simd | 28.3 | 4.2 | 7.9 | 1039.5 | 34.4 |
| 3 | int2\|none\|[T][S]Sparse\|tricameral\|simd | 23.2 | 4.3 | 7.4 | 957.8 | 32.6 |
| 4 | int8\|none\|[T][S][L]\|tricameral\|simd | 22.2 | 4.9 | 7.4 | 938.7 | 31.9 |
| 5 | float32\|none\|[T][S][L]\|tricameral\|simd | 21.8 | 5.4 | 5.8 | 1092.4 | 34.2 |
| 6 | uint8\|none\|[T][S][L]Cache\|tricameral\|simd | 21.7 | 4.2 | 6.8 | 924.5 | 34.4 |
| 7 | int8\|none\|[T][S]Sparse\|tricameral\|simd | 21.1 | 2.3 | 6.6 | 978.6 | 32.9 |
| 8 | int4\|none\|[T][S]Sparse\|tricameral\|simd | 20.5 | 2.8 | 6.3 | 976.2 | 33.2 |
| 9 | uint8\|none\|[T][S][L]\|tricameral\|simd | 19.4 | 4.6 | 7.1 | 844.0 | 32.4 |
| 10 | int4\|none\|[T][S][L]Cache\|tricameral\|simd | 19.4 | 1.5 | 5.5 | 1029.9 | 34.2 |
| 11 | int4\|none\|Mesh[T][S]Sparse\|tricameral\|simd | 19.2 | 2.0 | 6.0 | 971.1 | 33.1 |
| 12 | uint8\|none\|Mesh[T][S]Sparse\|tricameral\|simd | 18.1 | 2.2 | 6.0 | 894.3 | 33.8 |
| 13 | uint32\|none\|[T][S][L]Cache\|tricameral\|simd | 16.5 | 4.1 | 7.6 | 611.4 | 35.8 |
| 14 | int8\|none\|[T][S]\|tricameral\|simd | 15.9 | 2.2 | 9.6 | 660.6 | 25.0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 15 | int8\|none\|Mesh[T][S]\|tricameral\|simd | 15.8 | 2.4 | 9.7 | 654.5 | 25.0 |
| 16 | uint16\|none\|[T][S][L]Cache\|tricameral\|simd | 15.8 | 4.4 | 7.4 | 602.9 | 35.4 |
| 17 | float64\|none\|[T][S][L]\|tricameral\|simd | 15.3 | 5.4 | 5.9 | 754.4 | 34.6 |
| 18 | uint8\|none\|[T][S]\|tricameral\|simd | 15.3 | 2.1 | 10.2 | 592.2 | 25.3 |
| 19 | uint16\|none\|Mesh[T][S]Sparse\|tricameral\|simd | 15.1 | 2.5 | 7.7 | 570.5 | 34.2 |
| 20 | uint64\|none\|Mesh[T][S]Sparse\|tricameral\|simd | 14.5 | 2.7 | 7.6 | 564.0 | 33.9 |

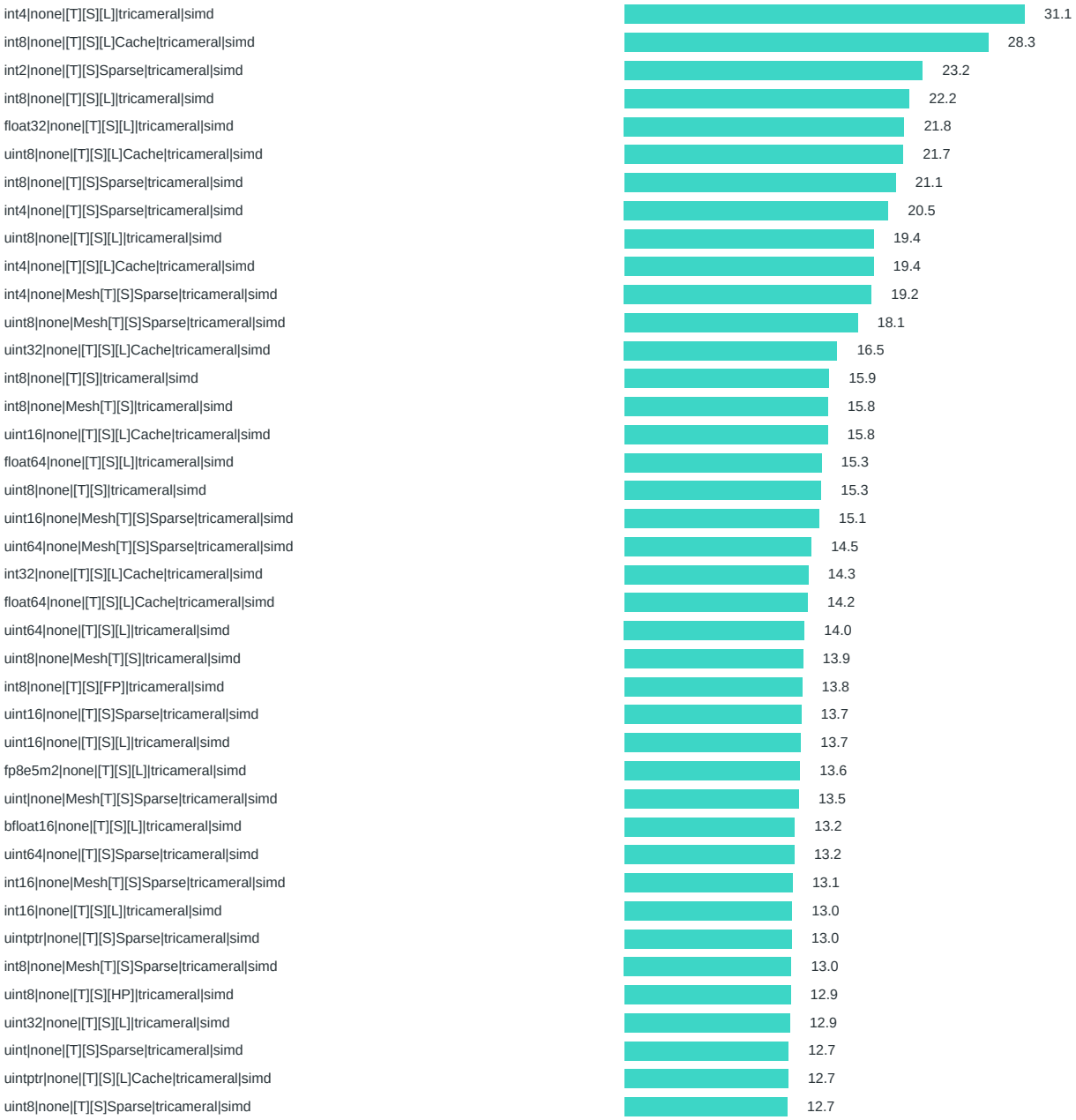
## Leaderboard (SoftAcc)

| # | Cell | Score | Soft | Acc | Thru | Avail |
|---|---|---|---|---|---|---|
| 1 | float32\|none\|[T][S][L]\|tricameral\|simd | 21.8 | 5.4 | 5.8 | 1092.4 | 34.2 |
| 2 | float64\|none\|[T][S][L]\|tricameral\|simd | 15.3 | 5.4 | 5.9 | 754.4 | 34.6 |
| 3 | bfloat16\|none\|[T][S][L]\|tricameral\|simd | 13.2 | 5.3 | 5.7 | 706.7 | 32.8 |
| 4 | int8\|none\|[T][S][L]\|tricameral\|simd | 22.2 | 4.9 | 7.4 | 938.7 | 31.9 |
| 5 | int16\|none\|[T][S][L]\|tricameral\|simd | 13.0 | 4.8 | 7.6 | 511.2 | 33.4 |
| 6 | uint16\|none\|[T][S][L]\|tricameral\|simd | 13.7 | 4.8 | 7.2 | 561.1 | 33.8 |
| 7 | uint64\|none\|[T][S][L]\|tricameral\|simd | 14.0 | 4.7 | 7.7 | 546.0 | 33.1 |
| 8 | uint8\|none\|[T][S][L]\|tricameral\|simd | 19.4 | 4.6 | 7.1 | 844.0 | 32.4 |
| 9 | int32\|none\|[T][S][L]Cache\|tricameral\|simd | 14.3 | 4.5 | 7.6 | 541.4 | 34.8 |
| 10 | uint32\|none\|[T][S][L]\|tricameral\|simd | 12.9 | 4.5 | 6.7 | 564.2 | 33.9 |
| 11 | fp8e5m2\|none\|[T][S][L]\|tricameral\|simd | 13.6 | 4.4 | 7.9 | 518.1 | 33.1 |
| 12 | uint16\|none\|[T][S][L]Cache\|tricameral\|simd | 15.8 | 4.4 | 7.4 | 602.9 | 35.4 |
| 13 | uintptr\|none\|[T][S][L]Cache\|tricameral\|simd | 12.7 | 4.4 | 7.3 | 504.1 | 34.8 |
| 14 | int2\|none\|[T][S]Sparse\|tricameral\|simd | 23.2 | 4.3 | 7.4 | 957.8 | 32.6 |
| 15 | uint8\|none\|[T][S][L]Cache\|tricameral\|simd | 21.7 | 4.2 | 6.8 | 924.5 | 34.4 |
| 16 | int8\|none\|[T][S][L]Cache\|tricameral\|simd | 28.3 | 4.2 | 7.9 | 1039.5 | 34.4 |
| 17 | uint32\|none\|[T][S][L]Cache\|tricameral\|simd | 16.5 | 4.1 | 7.6 | 611.4 | 35.8 |
| 18 | float64\|none\|[T][S][L]Cache\|tricameral\|simd | 14.2 | 3.2 | 5.4 | 764.3 | 34.6 |
| 19 | uint8\|none\|[T][S][HP]\|tricameral\|simd | 12.9 | 3.1 | 8.6 | 591.0 | 25.4 |
| 20 | int8\|none\|[T][S][FP]\|tricameral\|simd | 13.8 | 3.1 | 8.7 | 644.2 | 24.6 |

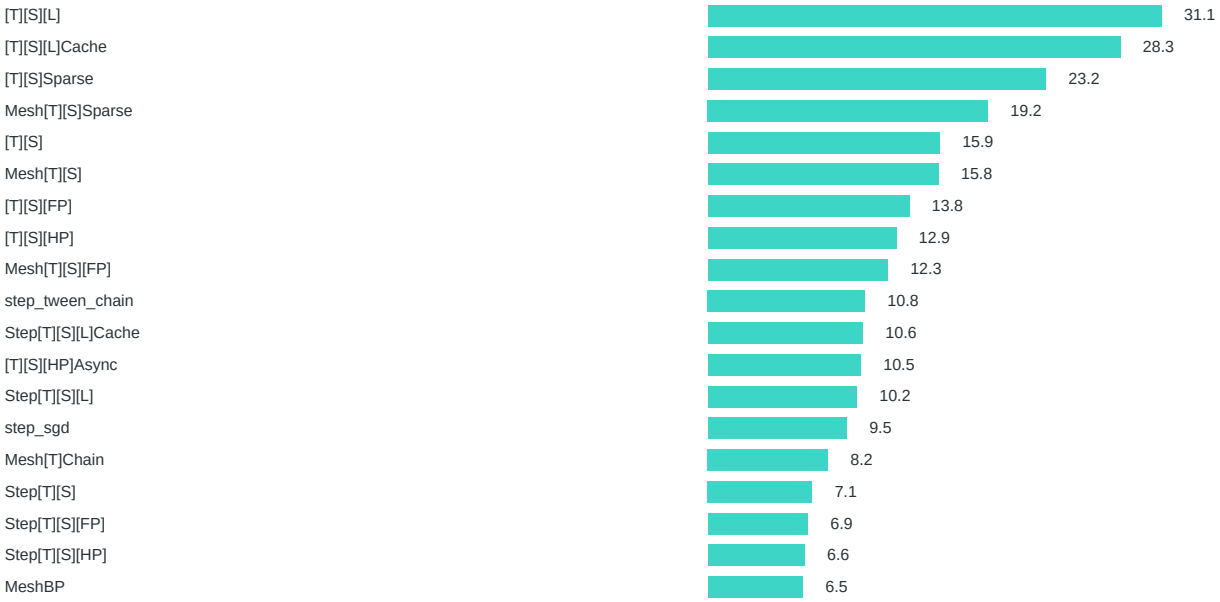
## Leaderboard (hard Acc)

| # | Cell | Score | Soft | Acc | Thru | Avail |
|---|---|---|---|---|---|---|
| 1 | int4\|none\|[T][S][L]\|tricameral\|simd | 31.1 | 1.5 | 10.4 | 936.1 | 32.1 |
| 2 | uint8\|none\|[T][S]\|tricameral\|simd | 15.3 | 2.1 | 10.2 | 592.2 | 25.3 |
| 3 | int8\|none\|Mesh[T][S]\|tricameral\|simd | 15.8 | 2.4 | 9.7 | 654.5 | 25.0 |
| 4 | int8\|none\|[T][S]\|tricameral\|simd | 15.9 | 2.2 | 9.6 | 660.6 | 25.0 |
| 5 | uint8\|none\|Mesh[T][S]\|tricameral\|simd | 13.9 | 2.1 | 9.3 | 587.3 | 25.3 |
| 6 | int8\|none\|[T][S][FP]\|tricameral\|simd | 13.8 | 3.1 | 8.7 | 644.2 | 24.6 |
| 7 | uint8\|none\|[T][S][HP]\|tricameral\|simd | 12.9 | 3.1 | 8.6 | 591.0 | 25.4 |
| 8 | uint\|none\|Mesh[T][S]Sparse\|tricameral\|simd | 13.5 | 2.8 | 8.2 | 482.8 | 34.0 |
| 9 | fp8e5m2\|none\|[T][S][L]\|tricameral\|simd | 13.6 | 4.4 | 7.9 | 518.1 | 33.1 |
| 10 | int8\|none\|[T][S][L]Cache\|tricameral\|simd | 28.3 | 4.2 | 7.9 | 1039.5 | 34.4 |
| 11 | uint16\|none\|Mesh[T][S]Sparse\|tricameral\|simd | 15.1 | 2.5 | 7.7 | 570.5 | 34.2 |
| 12 | uint64\|none\|[T][S][L]\|tricameral\|simd | 14.0 | 4.7 | 7.7 | 546.0 | 33.1 |
| 13 | int16\|none\|[T][S][L]\|tricameral\|simd | 13.0 | 4.8 | 7.6 | 511.2 | 33.4 |
| 14 | uintptr\|none\|[T][S]Sparse\|tricameral\|simd | 13.0 | 2.4 | 7.6 | 496.0 | 34.4 |
| 15 | uint64\|none\|Mesh[T][S]Sparse\|tricameral\|simd | 14.5 | 2.7 | 7.6 | 564.0 | 33.9 |
| 16 | int32\|none\|[T][S][L]Cache\|tricameral\|simd | 14.3 | 4.5 | 7.6 | 541.4 | 34.8 |
| 17 | uint32\|none\|[T][S][L]Cache\|tricameral\|simd | 16.5 | 4.1 | 7.6 | 611.4 | 35.8 |
| 18 | uint\|none\|[T][S]Sparse\|tricameral\|simd | 12.7 | 2.6 | 7.5 | 493.0 | 34.4 |
| 19 | int2\|none\|[T][S]Sparse\|tricameral\|simd | 23.2 | 4.3 | 7.4 | 957.8 | 32.6 |
| 20 | uint16\|none\|[T][S][L]Cache\|tricameral\|simd | 15.8 | 4.4 | 7.4 | 602.9 | 35.4 |

## Top scores



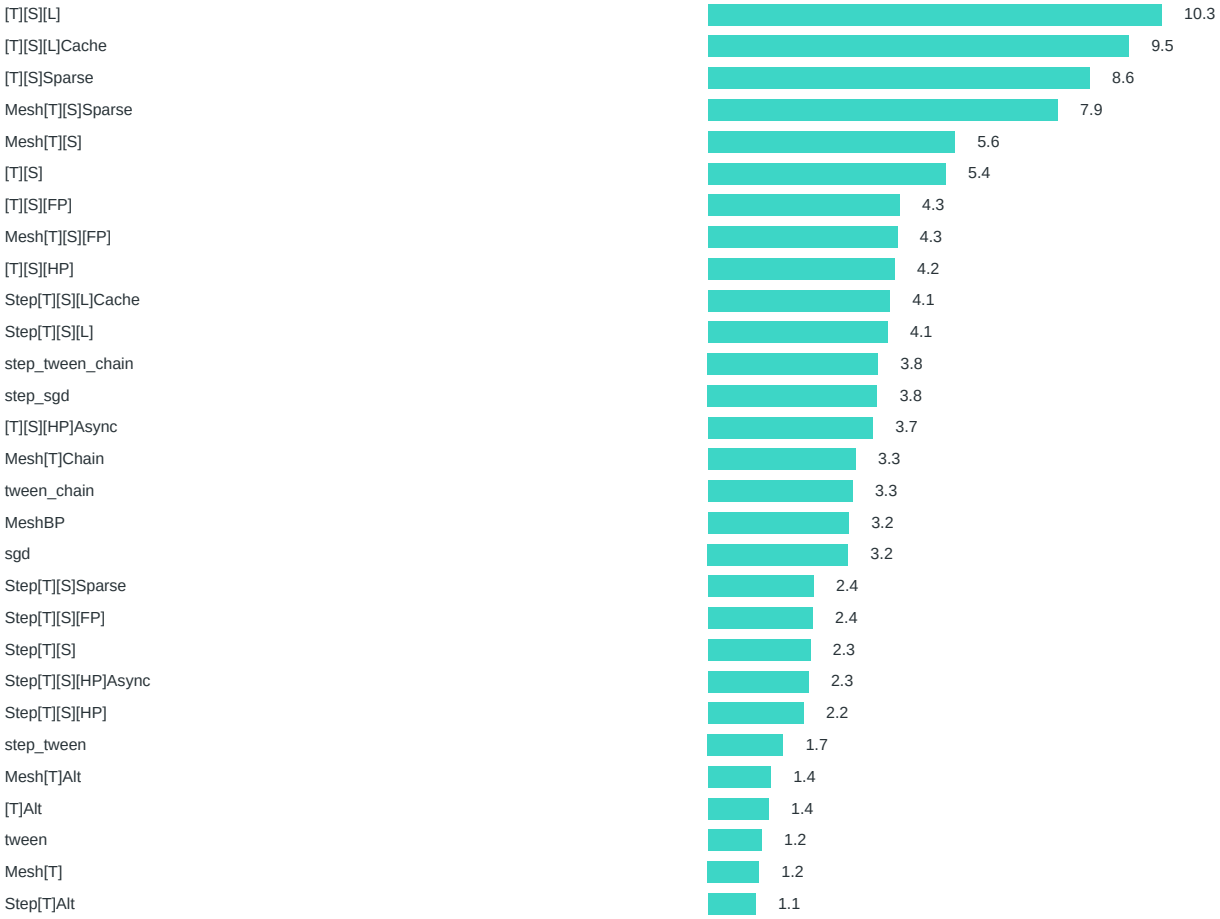

## Best settings per mode



## Best settings per mode




## Mean Score by train mode



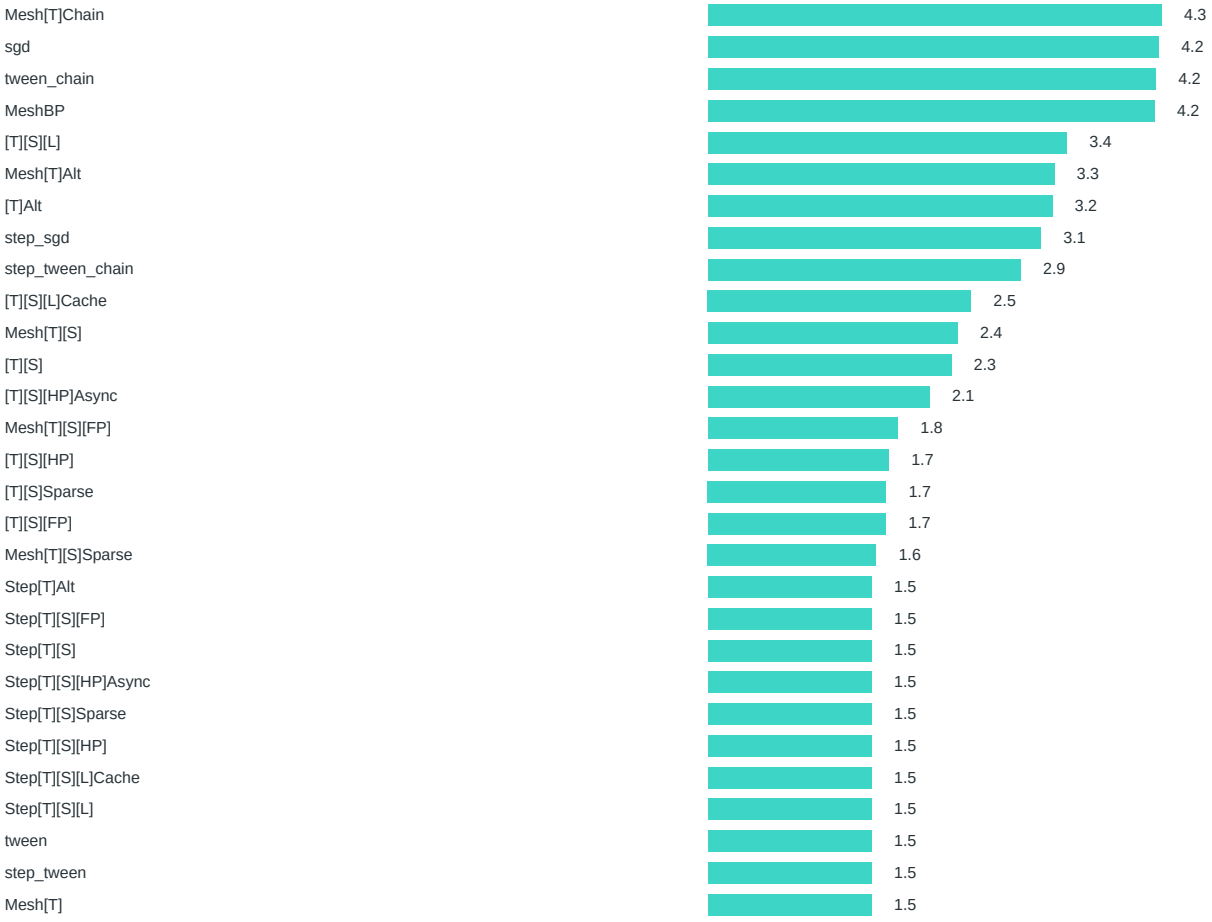

## Mean hard Acc by train mode



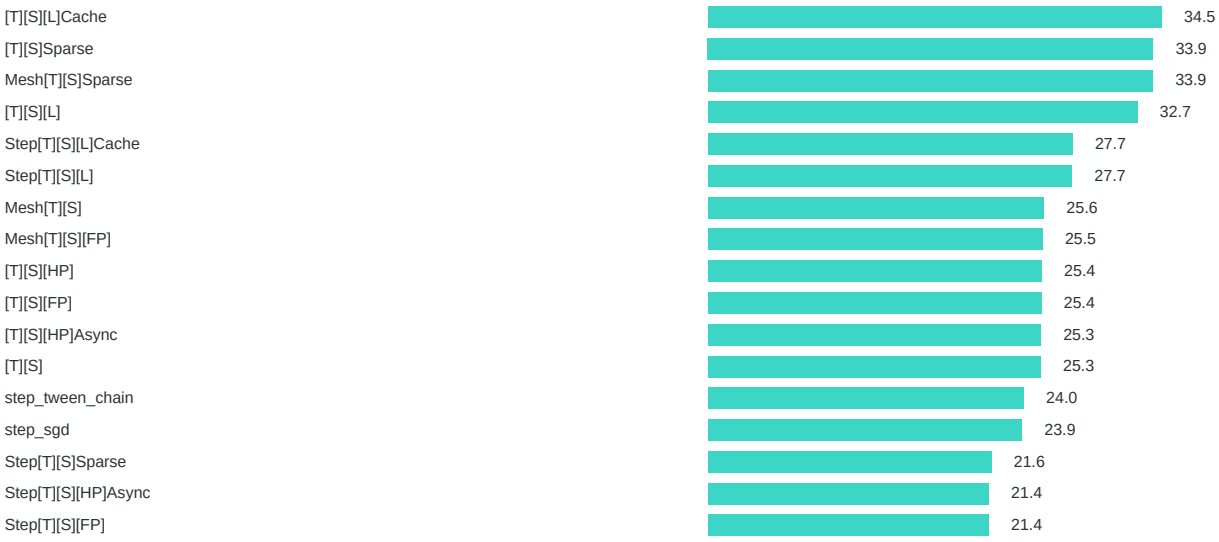
## Mean hard Acc by train mode



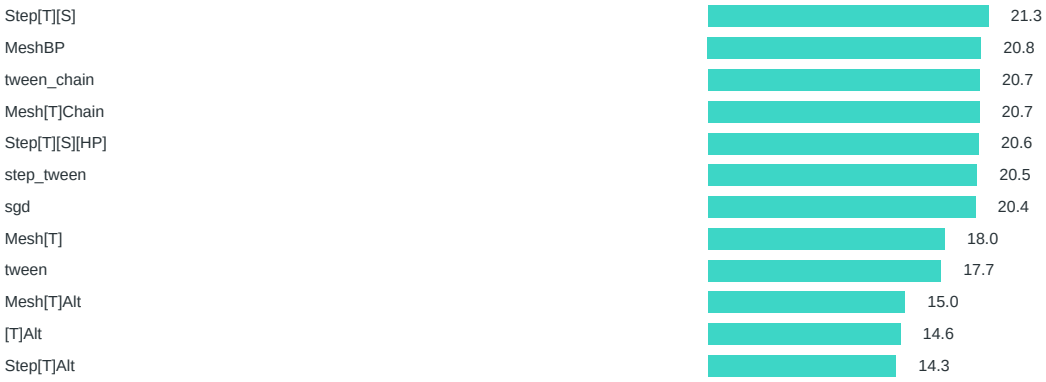

## Mean SoftAcc by train mode



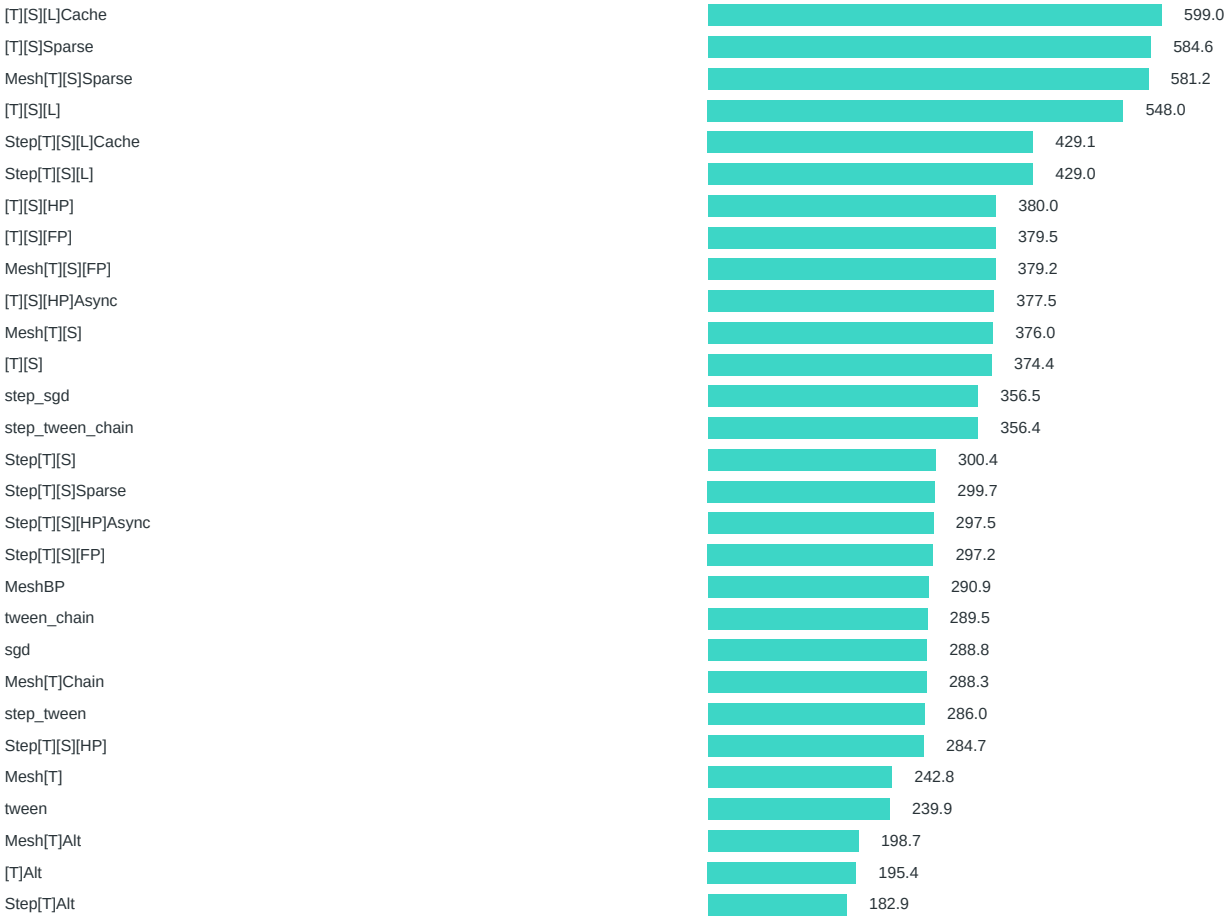

## Mean Availability by train mode



## Mean Availability by train mode



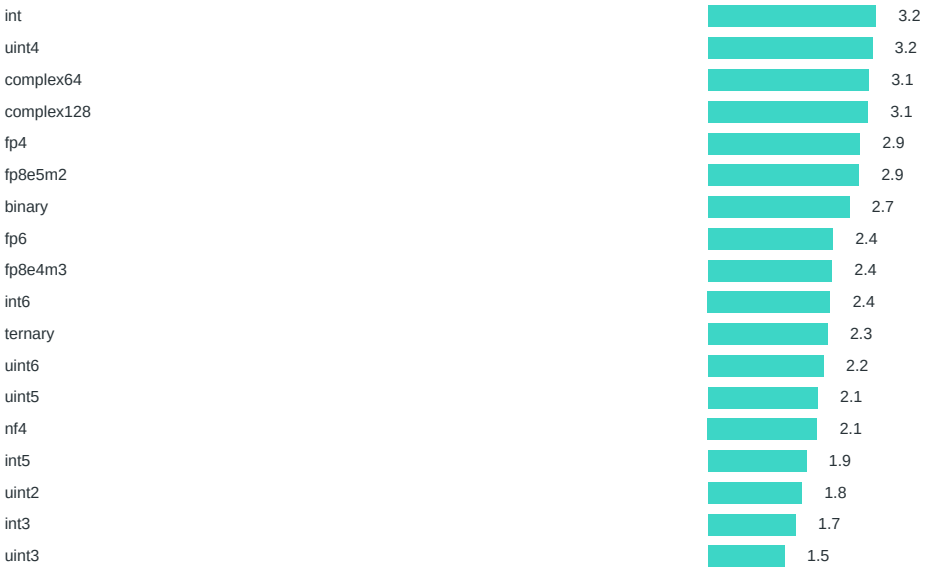

## Mean Throughput by train mode



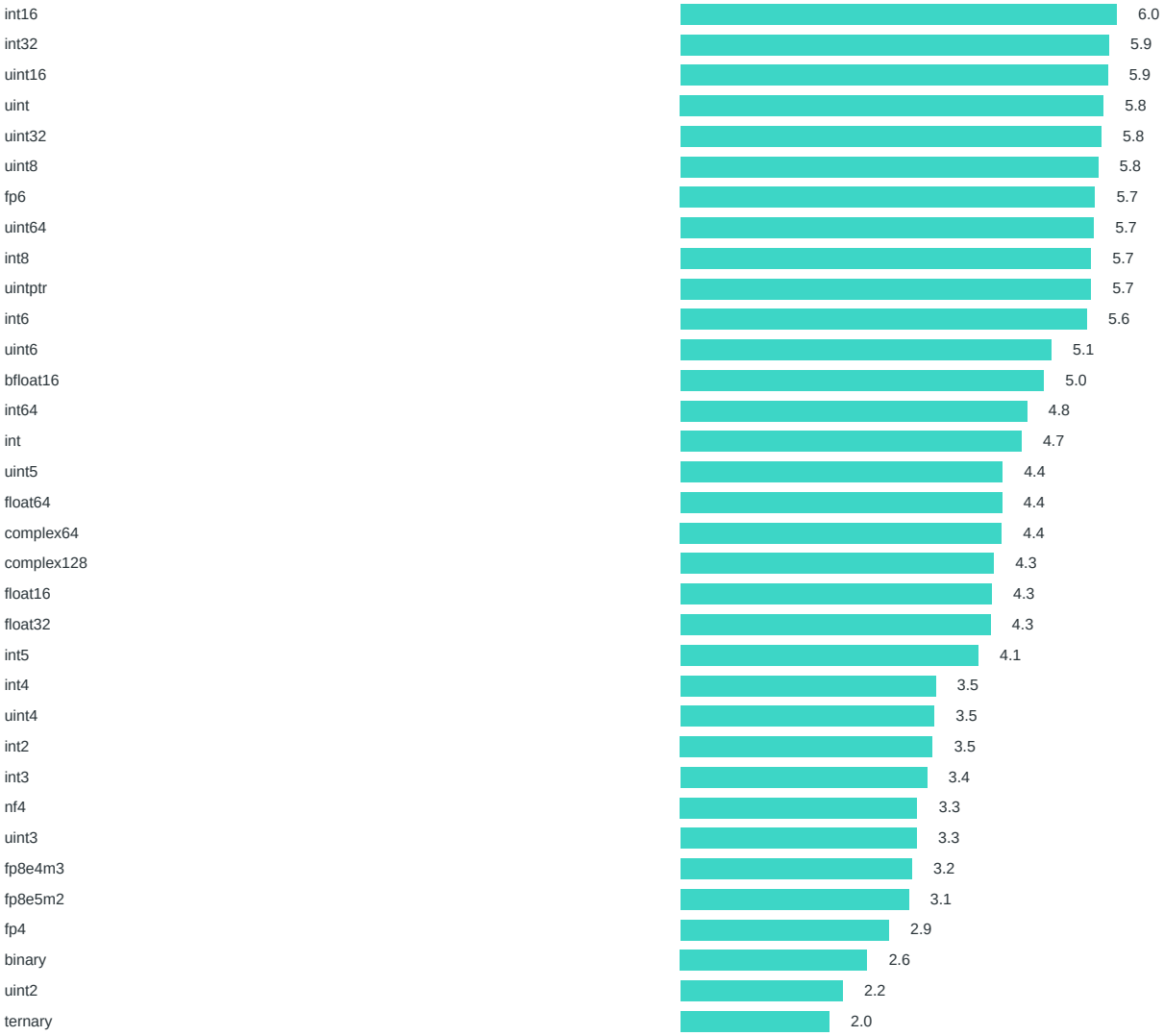

## Mean Score by dtype



## 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 | 3 | 5 | 4 | 2 | 2 | 3 | 3 | 3 |
| Mesh[T] | 3 | 1 | 2 | 1 | 1 | 3 | 2 | 1 | 0 | 1 | 1 | 2 |
| Mesh[T]Alt | 2 | 0 | 1 | 1 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 1 |
| Mesh[T]Chain | 4 | 5 | 3 | 3 | 3 | 6 | 5 | 2 | 2 | 3 | 3 | 3 |
| Mesh[T][S] | 8 | 3 | 5 | 4 | 5 | 9 | 7 | 3 | 5 | 5 | 3 | 6 |
| Mesh[T][S][FP] | 4 | 2 | 3 | 2 | 3 | 4 | 4 | 3 | 2 | 3 | 3 | 2 |
| Mesh[T][S]Sparse | 6 | 4 | 5 | 4 | 6 | 11 | 7 | 6 | 7 | 5 | 5 | 5 |
| Step[T]Alt | 2 | 0 | 1 | 1 | 2 | 3 | 3 | 1 | 1 | 0 | 0 | 1 |
| Step[T][S] | 6 | 2 | 2 | 3 | 3 | 7 | 5 | 2 | 1 | 1 | 1 | 4 |
| Step[T][S][FP] | 4 | 1 | 4 | 3 | 4 | 7 | 5 | 2 | 1 | 1 | 2 | 3 |
| Step[T][S][HP] | 4 | 1 | 3 | 3 | 4 | 7 | 3 | 2 | 1 | 1 | 1 | 2 |
| Step[T][S][HP]Async | 6 | 1 | 3 | 3 | 3 | 6 | 4 | 2 | 1 | 1 | 1 | 3 |
| Step[T][S][L] | 10 | 3 | 6 | 4 | 4 | 10 | 8 | 4 | 2 | 2 | 3 | 3 |
| Step[T][S][L]Cache | 7 | 3 | 4 | 5 | 5 | 11 | 7 | 4 | 3 | 2 | 3 | 6 |
| Step[T][S]Sparse | 5 | 1 | 3 | 3 | 4 | 6 | 5 | 2 | 1 | 1 | 2 | 3 |
| [T]Alt | 2 | 0 | 1 | 1 | 1 | 3 | 2 | 1 | 1 | 1 | 2 | 1 |
| [T][S] | 8 | 1 | 4 | 4 | 5 | 7 | 7 | 3 | 5 | 4 | 3 | 5 |
| [T][S][FP] | 3 | 2 | 2 | 2 | 3 | 5 | 4 | 3 | 4 | 3 | 3 | 2 |
| [T][S][HP] | 3 | 2 | 2 | 2 | 3 | 4 | 4 | 3 | 4 | 4 | 3 | 2 |
| [T][S][HP]Async | 4 | 2 | 2 | 2 | 2 | 4 | 3 | 3 | 3 | 3 | 3 | 2 |
| [T][S][L] | 13 | 5 | 8 | 9 | 11 | 22 | 15 | 6 | 5 | 2 | 14 | 8 |
| [T][S][L]Cache | 9 | 7 | 7 | 6 | 8 | 10 | 14 | 7 | 5 | 8 | 10 | 6 |
| [T][S]Sparse | 7 | 5 | 4 | 4 | 5 | 10 | 7 | 7 | 6 | 5 | 5 | 4 |
| sgd | 4 | 5 | 3 | 3 | 3 | 5 | 4 | 3 | 2 | 3 | 3 | 3 |
| step_sgd | 6 | 6 | 2 | 4 | 2 | 4 | 6 | 3 | 2 | 2 | 2 | 2 |
| step_tween | 4 | 1 | 2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 1 | 2 |
| step_tween_chain | 3 | 5 | 2 | 4 | 3 | 5 | 3 | 3 | 2 | 3 | 3 | 4 |
| tween | 3 | 1 | 1 | 1 | 1 | 3 | 2 | 1 | 0 | 1 | 1 | 1 |
| tween_chain | 4 | 5 | 3 | 3 | 3 | 6 | 4 | 2 | 2 | 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 | 7 | 2 | 3 | 5 | 2 | 1 | 3 | 4 | 3 | 3 | 2 |
| Mesh[T] | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 2 | 2 | 0 | 1 | 1 |
| Mesh[T]Alt | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 0 | 1 |
| Mesh[T]Chain | 4 | 6 | 2 | 3 | 6 | 2 | 2 | 3 | 8 | 3 | 3 | 2 |
| Mesh[T][S] | 11 | 1 | 1 | 10 | 2 | 1 | 4 | 6 | 16 | 1 | 2 | 9 |
| Mesh[T][S][FP] | 8 | 2 | 1 | 8 | 2 | 1 | 4 | 3 | 12 | 1 | 2 | 8 |
| Mesh[T][S]Sparse | 13 | 5 | 3 | 8 | 19 | 7 | 5 | 5 | 13 | 7 | 5 | 14 |
| Step[T]Alt | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 2 | 0 | 0 | 2 |
| Step[T][S] | 4 | 1 | 0 | 3 | 1 | 1 | 1 | 4 | 5 | 1 | 1 | 2 |
| Step[T][S][FP] | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 4 | 3 | 1 | 1 | 3 |
| Step[T][S][HP] | 4 | 1 | 1 | 3 | 1 | 1 | 1 | 3 | 5 | 0 | 1 | 3 |
| Step[T][S][HP]Async | 3 | 1 | 0 | 3 | 1 | 1 | 1 | 4 | 4 | 1 | 1 | 2 |
| Step[T][S][L] | 5 | 3 | 1 | 4 | 3 | 1 | 2 | 9 | 7 | 1 | 3 | 4 |
| Step[T][S][L]Cache | 5 | 3 | 1 | 4 | 3 | 1 | 2 | 6 | 7 | 2 | 4 | 4 |
| Step[T][S]Sparse | 4 | 1 | 1 | 3 | 2 | 1 | 2 | 4 | 4 | 1 | 1 | 2 |
| [T]Alt | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 3 | 1 | 0 | 1 |
| [T][S] | 9 | 1 | 1 | 11 | 2 | 2 | 4 | 7 | 16 | 1 | 1 | 9 |
| [T][S][FP] | 7 | 1 | 1 | 9 | 2 | 3 | 2 | 3 | 14 | 1 | 1 | 6 |
| [T][S][HP] | 7 | 2 | 1 | 8 | 3 | 2 | 3 | 3 | 11 | 1 | 2 | 8 |
| [T][S][HP]Async | 6 | 2 | 1 | 6 | 2 | 2 | 3 | 3 | 10 | 4 | 2 | 4 |
| [T][S][L] | 13 | 6 | 4 | 12 | 31 | 4 | 7 | 10 | 22 | 6 | 4 | 11 |
| [T][S][L]Cache | 11 | 5 | 2 | 14 | 19 | 4 | 5 | 7 | 28 | 6 | 8 | 12 |
| [T][S]Sparse | 11 | 23 | 9 | 10 | 21 | 7 | 6 | 5 | 21 | 3 | 5 | 13 |
| sgd | 3 | 5 | 2 | 4 | 5 | 2 | 2 | 3 | 5 | 3 | 2 | 3 |
| step_sgd | 4 | 7 | 3 | 5 | 7 | 2 | 3 | 3 | 7 | 4 | 2 | 3 |
| step_tween | 2 | 1 | 0 | 1 | 2 | 0 | 0 | 2 | 4 | 1 | 1 | 2 |
| step_tween_chain | 4 | 7 | 4 | 5 | 5 | 2 | 3 | 2 | 11 | 3 | 4 | 3 |
| tween | 2 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 2 | 0 | 1 | 2 |
| tween_chain | 3 | 6 | 3 | 3 | 6 | 2 | 2 | 3 | 6 | 2 | 3 | 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 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 2 | 6 | 2 |
| Mesh[T] | 2 | 1 | 0 | 1 | 1 | 0 | 0 | 2 | 2 | 1 |
| Mesh[T]Alt | 2 | 0 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 1 |
| Mesh[T]Chain | 3 | 2 | 2 | 4 | 3 | 2 | 2 | 3 | 6 | 3 |
| Mesh[T][S] | 9 | 2 | 1 | 11 | 2 | 2 | 4 | 10 | 14 | 8 |
| Mesh[T][S][FP] | 8 | 1 | 1 | 9 | 3 | 2 | 5 | 9 | 12 | 8 |
| Mesh[T][S]Sparse | 15 | 3 | 3 | 12 | 7 | 7 | 7 | 15 | 18 | 8 |
| Step[T]Alt | 2 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 2 | 1 |
| Step[T][S] | 3 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 3 | 2 |
| Step[T][S][FP] | 4 | 1 | 1 | 3 | 1 | 1 | 1 | 3 | 3 | 3 |
| Step[T][S][HP] | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 3 | 3 | 2 |
| Step[T][S][HP]Async | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 3 | 3 | 3 |
| Step[T][S][L] | 4 | 1 | 1 | 7 | 2 | 2 | 3 | 4 | 8 | 5 |
| Step[T][S][L]Cache | 5 | 2 | 1 | 7 | 2 | 2 | 2 | 5 | 7 | 5 |
| Step[T][S]Sparse | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 3 | 4 | 2 |
| [T]Alt | 2 | 0 | 2 | 2 | 1 | 1 | 1 | 1 | 3 | 2 |
| [T][S] | 11 | 2 | 1 | 10 | 2 | 1 | 4 | 10 | 15 | 9 |
| [T][S][FP] | 6 | 2 | 1 | 7 | 8 | 4 | 3 | 8 | 12 | 7 |
| [T][S][HP] | 8 | 1 | 1 | 8 | 4 | 3 | 3 | 8 | 13 | 7 |
| [T][S][HP]Async | 7 | 1 | 1 | 6 | 2 | 4 | 1 | 6 | 10 | 6 |
| [T][S][L] | 14 | 4 | 5 | 13 | 9 | 4 | 5 | 14 | 19 | 11 |
| [T][S][L]Cache | 16 | 5 | 3 | 17 | 11 | 3 | 4 | 12 | 22 | 13 |
| [T][S]Sparse | 14 | 3 | 2 | 12 | 7 | 8 | 6 | 13 | 13 | 13 |
| sgd | 2 | 2 | 2 | 3 | 4 | 2 | 2 | 2 | 5 | 3 |
| step_sgd | 4 | 3 | 4 | 4 | 5 | 2 | 3 | 3 | 10 | 4 |
| step_tween | 2 | 1 | 1 | 2 | 1 | 1 | 0 | 3 | 3 | 2 |
| step_tween_chain | 5 | 3 | 2 | 4 | 4 | 2 | 2 | 5 | 8 | 3 |
| tween | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 2 | 1 |
| tween_chain | 4 | 4 | 2 | 3 | 4 | 2 | 2 | 3 | 6 | 2 |

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

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

| | bfloat16 | binary | complex128 | complex64 | float16 | float32 | float64 | fp4 | fp6 | fp8e4m3 | fp8e5m2 | int |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MeshBP | 5 | 7 | 6 | 6 | 5 | 5 | 5 | 2 | 7 | 5 | 5 | 5 |
| Mesh[T] | 5 | 1 | 5 | 3 | 3 | 4 | 3 | 2 | 2 | 1 | 1 | 4 |
| Mesh[T]Alt | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 2 | 5 |
| Mesh[T]Chain | 5 | 7 | 5 | 6 | 5 | 6 | 5 | 3 | 7 | 5 | 5 | 5 |
| Mesh[T][S] | 7 | 2 | 6 | 5 | 5 | 6 | 5 | 3 | 11 | 6 | 3 | 7 |
| Mesh[T][S][FP] | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 3 |
| Mesh[T][S]Sparse | 2 | 1 | 3 | 3 | 3 | 3 | 3 | 2 | 8 | 3 | 3 | 3 |
| Step[T]Alt | 8 | 2 | 5 | 7 | 8 | 6 | 7 | 3 | 5 | 2 | 2 | 6 |
| Step[T][S] | 8 | 2 | 4 | 5 | 5 | 6 | 6 | 2 | 4 | 1 | 2 | 7 |
| Step[T][S][FP] | 4 | 1 | 8 | 5 | 6 | 6 | 7 | 3 | 5 | 2 | 3 | 6 |
| Step[T][S][HP] | 6 | 1 | 5 | 6 | 7 | 6 | 4 | 2 | 3 | 1 | 2 | 5 |
| Step[T][S][HP]Async | 8 | 1 | 6 | 5 | 4 | 5 | 5 | 3 | 3 | 2 | 2 | 6 |
| Step[T][S][L] | 7 | 2 | 6 | 5 | 3 | 5 | 5 | 3 | 3 | 2 | 3 | 4 |
| Step[T][S][L]Cache | 5 | 2 | 4 | 6 | 5 | 5 | 5 | 3 | 5 | 2 | 3 | 6 |
| Step[T][S]Sparse | 6 | 2 | 6 | 5 | 6 | 6 | 6 | 3 | 3 | 1 | 2 | 5 |
| [T]Alt | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 4 | 3 | 4 |
| [T][S] | 7 | 1 | 4 | 5 | 5 | 4 | 5 | 3 | 10 | 5 | 3 | 7 |
| [T][S][FP] | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 9 | 3 | 4 | 3 |
| [T][S][HP] | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 9 | 4 | 3 | 3 |
| [T][S][HP]Async | 3 | 1 | 2 | 3 | 2 | 3 | 3 | 3 | 7 | 3 | 3 | 3 |
| [T][S][L] | 6 | 3 | 5 | 6 | 6 | 6 | 6 | 2 | 6 | 2 | 8 | 5 |
| [T][S][L]Cache | 4 | 2 | 4 | 4 | 4 | 3 | 5 | 3 | 6 | 5 | 5 | 3 |
| [T][S]Sparse | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 2 | 3 |
| sgd | 6 | 7 | 5 | 5 | 6 | 5 | 6 | 3 | 7 | 6 | 5 | 6 |
| step_sgd | 5 | 6 | 3 | 5 | 2 | 3 | 5 | 3 | 5 | 3 | 2 | 3 |
| step_tween | 6 | 1 | 3 | 4 | 4 | 3 | 4 | 3 | 3 | 2 | 2 | 4 |
| step_tween_chain | 3 | 5 | 3 | 5 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 5 |
| tween | 5 | 2 | 4 | 4 | 3 | 3 | 4 | 2 | 2 | 2 | 1 | 3 |
| tween_chain | 6 | 7 | 5 | 5 | 5 | 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 | 5 | 8 | 7 | 6 | 6 | 7 | 4 | 5 | 4 | 7 | 4 | 4 |
| Mesh[T] | 3 | 2 | 1 | 2 | 2 | 1 | 2 | 4 | 3 | 1 | 1 | 3 |
| Mesh[T]Alt | 8 | 9 | 8 | 7 | 5 | 5 | 6 | 5 | 7 | 7 | 2 | 7 |
| Mesh[T]Chain | 7 | 7 | 7 | 5 | 6 | 5 | 6 | 5 | 8 | 7 | 5 | 4 |
| Mesh[T][S] | 11 | 1 | 2 | 11 | 1 | 3 | 9 | 7 | 10 | 1 | 2 | 10 |
| Mesh[T][S][FP] | 9 | 2 | 2 | 8 | 1 | 3 | 9 | 3 | 8 | 1 | 2 | 9 |
| Mesh[T][S]Sparse | 7 | 2 | 2 | 5 | 6 | 7 | 6 | 3 | 4 | 5 | 2 | 8 |
| Step[T]Alt | 4 | 2 | 1 | 4 | 2 | 3 | 5 | 6 | 4 | 1 | 2 | 7 |
| Step[T][S] | 7 | 1 | 1 | 5 | 1 | 2 | 4 | 6 | 4 | 2 | 1 | 4 |
| Step[T][S][FP] | 4 | 1 | 2 | 5 | 1 | 3 | 3 | 7 | 3 | 1 | 2 | 5 |
| Step[T][S][HP] | 6 | 2 | 2 | 5 | 1 | 5 | 4 | 5 | 5 | 1 | 1 | 6 |
| Step[T][S][HP]Async | 5 | 1 | 1 | 5 | 2 | 3 | 2 | 6 | 4 | 2 | 1 | 4 |
| Step[T][S][L] | 5 | 2 | 2 | 4 | 2 | 3 | 3 | 8 | 3 | 2 | 1 | 4 |
| Step[T][S][L]Cache | 5 | 2 | 1 | 4 | 2 | 2 | 3 | 5 | 3 | 2 | 2 | 4 |
| Step[T][S]Sparse | 6 | 1 | 2 | 5 | 2 | 3 | 5 | 6 | 4 | 2 | 2 | 4 |
| [T]Alt | 7 | 9 | 8 | 6 | 6 | 5 | 6 | 5 | 7 | 7 | 1 | 7 |
| [T][S] | 10 | 1 | 1 | 11 | 1 | 4 | 8 | 8 | 10 | 2 | 1 | 10 |
| [T][S][FP] | 7 | 1 | 2 | 9 | 2 | 5 | 5 | 3 | 9 | 2 | 1 | 8 |
| [T][S][HP] | 7 | 1 | 1 | 9 | 2 | 5 | 7 | 3 | 7 | 2 | 2 | 9 |
| [T][S][HP]Async | 7 | 2 | 2 | 7 | 2 | 4 | 7 | 3 | 7 | 5 | 2 | 5 |
| [T][S][L] | 8 | 2 | 4 | 7 | 10 | 5 | 9 | 6 | 7 | 4 | 2 | 7 |
| [T][S][L]Cache | 6 | 2 | 2 | 8 | 5 | 4 | 6 | 3 | 8 | 4 | 3 | 7 |
| [T][S]Sparse | 6 | 7 | 8 | 6 | 6 | 8 | 7 | 3 | 7 | 2 | 1 | 8 |
| sgd | 5 | 7 | 7 | 6 | 7 | 6 | 8 | 5 | 6 | 6 | 3 | 5 |
| step_sgd | 4 | 7 | 6 | 6 | 5 | 6 | 7 | 3 | 4 | 6 | 3 | 4 |
| step_tween | 4 | 2 | 1 | 2 | 2 | 1 | 2 | 4 | 4 | 2 | 2 | 4 |
| step_tween_chain | 5 | 7 | 7 | 6 | 4 | 4 | 7 | 3 | 7 | 5 | 5 | 4 |
| tween | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 1 | 2 | 4 |
| tween_chain | 4 | 7 | 7 | 6 | 7 | 6 | 7 | 5 | 6 | 5 | 4 | 6 |

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

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

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

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

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

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

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

| | bfloat16 | binary | complex128 | complex64 | float16 | float32 | float64 | fp4 | fp6 | fp8e4m3 | fp8e5m2 | int |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MeshBP | 20 | 18 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 |
| Mesh[T] | 18 | 15 | 18 | 18 | 19 | 18 | 18 | 18 | 18 | 19 | 18 | 19 |
| Mesh[T]Alt | 20 | 11 | 20 | 21 | 21 | 20 | 20 | 13 | 14 | 14 | 21 | 16 |
| Mesh[T]Chain | 20 | 17 | 21 | 22 | 21 | 21 | 22 | 20 | 21 | 21 | 20 | 22 |
| Mesh[T][S] | 25 | 23 | 27 | 26 | 26 | 24 | 26 | 25 | 27 | 27 | 25 | 27 |
| Mesh[T][S][FP] | 25 | 23 | 27 | 26 | 25 | 24 | 26 | 25 | 26 | 26 | 26 | 27 |
| Mesh[T][S]Sparse | 33 | 32 | 34 | 34 | 34 | 33 | 34 | 33 | 34 | 34 | 34 | 34 |
| Step[T]Alt | 14 | 11 | 15 | 15 | 14 | 15 | 15 | 13 | 14 | 15 | 14 | 15 |
| Step[T][S] | 21 | 19 | 23 | 22 | 21 | 21 | 22 | 20 | 22 | 22 | 21 | 22 |
| Step[T][S][FP] | 21 | 19 | 22 | 22 | 22 | 21 | 22 | 20 | 22 | 23 | 22 | 22 |
| Step[T][S][HP] | 20 | 18 | 22 | 21 | 22 | 21 | 22 | 20 | 21 | 21 | 21 | 22 |
| Step[T][S][HP]Async | 21 | 19 | 22 | 22 | 21 | 21 | 22 | 21 | 22 | 22 | 21 | 22 |
| Step[T][S][L] | 28 | 27 | 28 | 29 | 28 | 28 | 28 | 27 | 27 | 28 | 28 | 28 |
| Step[T][S][L]Cache | 28 | 27 | 28 | 28 | 28 | 28 | 29 | 27 | 28 | 28 | 28 | 28 |
| Step[T][S]Sparse | 21 | 19 | 23 | 22 | 22 | 21 | 22 | 21 | 22 | 23 | 22 | 22 |
| [T]Alt | 20 | 11 | 20 | 19 | 21 | 20 | 19 | 13 | 13 | 14 | 20 | 16 |
| [T][S] | 25 | 22 | 26 | 26 | 26 | 25 | 26 | 24 | 27 | 26 | 25 | 26 |
| [T][S][FP] | 25 | 23 | 26 | 26 | 26 | 24 | 26 | 24 | 26 | 26 | 25 | 26 |
| [T][S][HP] | 24 | 23 | 26 | 26 | 26 | 24 | 25 | 24 | 26 | 26 | 25 | 27 |
| [T][S][HP]Async | 24 | 23 | 26 | 27 | 25 | 24 | 25 | 25 | 27 | 26 | 25 | 26 |
| [T][S][L] | 33 | 28 | 34 | 34 | 34 | 34 | 35 | 34 | 32 | 32 | 33 | 33 |
| [T][S][L]Cache | 33 | 34 | 35 | 34 | 34 | 34 | 35 | 34 | 34 | 35 | 35 | 35 |
| [T][S]Sparse | 34 | 33 | 34 | 35 | 34 | 33 | 34 | 33 | 35 | 34 | 34 | 34 |
| sgd | 19 | 19 | 22 | 21 | 20 | 19 | 20 | 20 | 21 | 20 | 20 | 21 |
| step_sgd | 24 | 20 | 24 | 25 | 24 | 24 | 25 | 22 | 24 | 24 | 23 | 25 |
| step_tween | 20 | 17 | 21 | 21 | 21 | 20 | 21 | 19 | 21 | 21 | 21 | 21 |
| step_tween_chain | 23 | 20 | 25 | 25 | 25 | 24 | 25 | 23 | 25 | 24 | 24 | 25 |
| tween | 18 | 15 | 18 | 19 | 18 | 18 | 18 | 17 | 18 | 17 | 17 | 19 |
| tween_chain | 20 | 18 | 22 | 22 | 21 | 21 | 21 | 20 | 21 | 21 | 20 | 22 |

## 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 | 22 | 19 | 21 | 21 | 19 | 21 | 22 | 21 | 21 | 22 | 18 | 21 |
| Mesh[T] | 19 | 16 | 18 | 19 | 16 | 19 | 19 | 19 | 18 | 18 | 15 | 19 |
| Mesh[T]Alt | 15 | 11 | 14 | 14 | 11 | 14 | 14 | 16 | 13 | 14 | 11 | 13 |
| Mesh[T]Chain | 21 | 19 | 21 | 22 | 19 | 21 | 21 | 21 | 21 | 21 | 18 | 21 |
| Mesh[T][S] | 27 | 22 | 26 | 26 | 23 | 27 | 27 | 25 | 25 | 26 | 22 | 26 |
| Mesh[T][S][FP] | 26 | 22 | 26 | 27 | 23 | 26 | 26 | 26 | 24 | 26 | 22 | 27 |
| Mesh[T][S]Sparse | 34 | 33 | 34 | 34 | 33 | 34 | 34 | 34 | 34 | 34 | 33 | 34 |
| Step[T]Alt | 15 | 12 | 15 | 15 | 13 | 15 | 15 | 15 | 13 | 15 | 11 | 15 |
| Step[T][S] | 22 | 19 | 21 | 22 | 20 | 22 | 22 | 22 | 21 | 21 | 19 | 22 |
| Step[T][S][FP] | 22 | 18 | 22 | 23 | 19 | 22 | 22 | 22 | 20 | 21 | 19 | 22 |
| Step[T][S][HP] | 22 | 18 | 20 | 21 | 19 | 21 | 21 | 21 | 20 | 21 | 17 | 20 |
| Step[T][S][HP]Async | 23 | 19 | 22 | 22 | 19 | 22 | 22 | 22 | 20 | 21 | 19 | 22 |
| Step[T][S][L] | 28 | 26 | 27 | 28 | 28 | 27 | 28 | 28 | 28 | 27 | 27 | 29 |
| Step[T][S][L]Cache | 28 | 26 | 27 | 28 | 28 | 28 | 27 | 29 | 27 | 27 | 27 | 28 |
| Step[T][S]Sparse | 22 | 19 | 22 | 22 | 19 | 22 | 23 | 22 | 20 | 22 | 19 | 22 |
| [T]Alt | 14 | 11 | 13 | 13 | 11 | 14 | 14 | 16 | 13 | 14 | 11 | 14 |
| [T][S] | 26 | 22 | 26 | 26 | 23 | 27 | 27 | 26 | 25 | 26 | 22 | 26 |
| [T][S][FP] | 26 | 22 | 26 | 27 | 23 | 27 | 27 | 26 | 25 | 26 | 22 | 26 |
| [T][S][HP] | 27 | 23 | 26 | 26 | 23 | 27 | 26 | 26 | 24 | 26 | 22 | 26 |
| [T][S][HP]Async | 26 | 22 | 26 | 26 | 23 | 26 | 26 | 26 | 24 | 25 | 22 | 26 |
| [T][S][L] | 33 | 30 | 32 | 34 | 32 | 32 | 32 | 33 | 32 | 32 | 29 | 34 |
| [T][S][L]Cache | 35 | 33 | 34 | 35 | 34 | 34 | 34 | 36 | 34 | 35 | 33 | 35 |
| [T][S]Sparse | 34 | 33 | 34 | 34 | 33 | 34 | 35 | 34 | 33 | 34 | 33 | 34 |
| sgd | 21 | 17 | 21 | 21 | 18 | 21 | 21 | 21 | 20 | 22 | 17 | 21 |
| step_sgd | 25 | 21 | 25 | 25 | 22 | 24 | 24 | 25 | 24 | 25 | 19 | 24 |
| step_tween | 22 | 19 | 21 | 21 | 19 | 21 | 20 | 21 | 21 | 20 | 17 | 21 |
| step_tween_chain | 25 | 21 | 25 | 25 | 21 | 25 | 25 | 25 | 24 | 24 | 20 | 25 |
| tween | 18 | 16 | 18 | 18 | 17 | 18 | 18 | 18 | 18 | 18 | 15 | 18 |
| tween_chain | 21 | 18 | 22 | 21 | 19 | 21 | 21 | 21 | 20 | 21 | 18 | 21 |

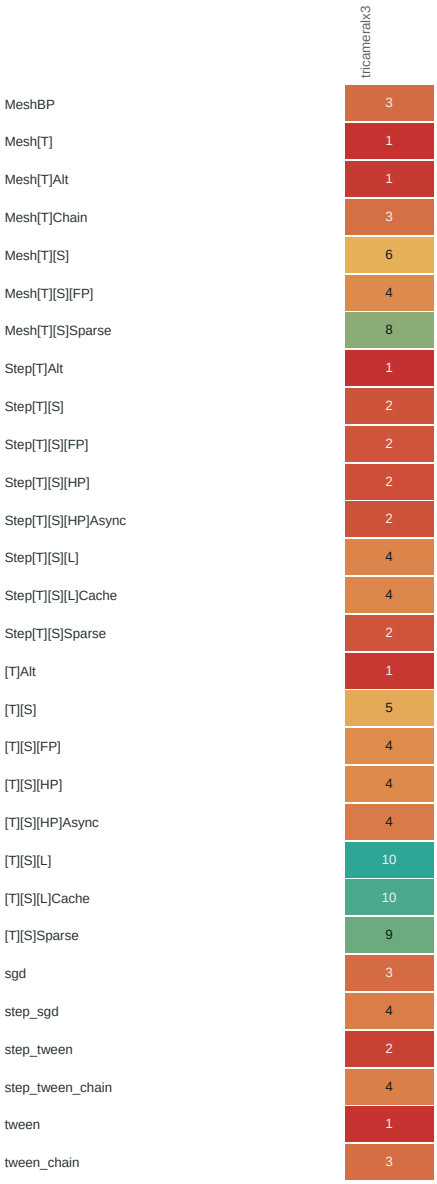
## Honesty - mean Avail, every mode x dtype  (cols 25-34)

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

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

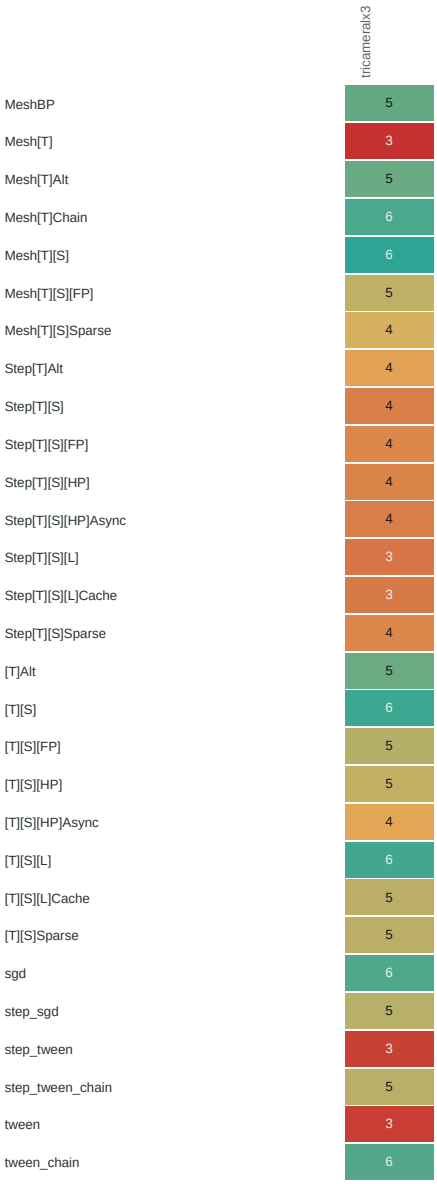
## Mean Score, every mode x arch

## Mean Score, every mode x arch




## Mean hard Acc, every mode x arch

## Mean hard Acc, every mode x arch

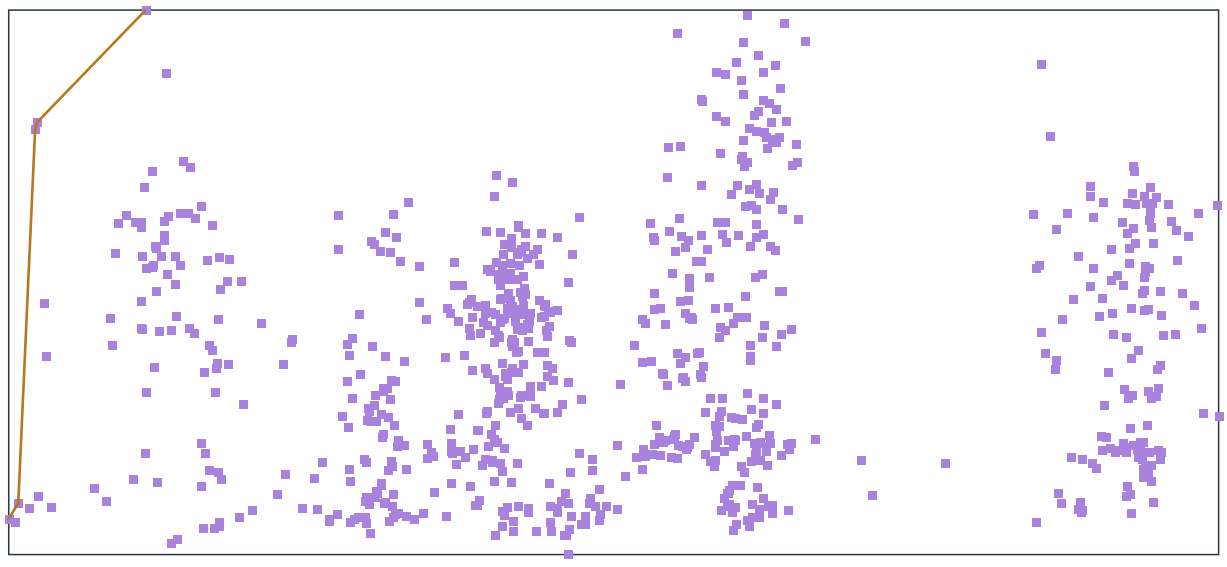



## Mean Avail, every mode x arch

## Mean Avail, every mode x arch

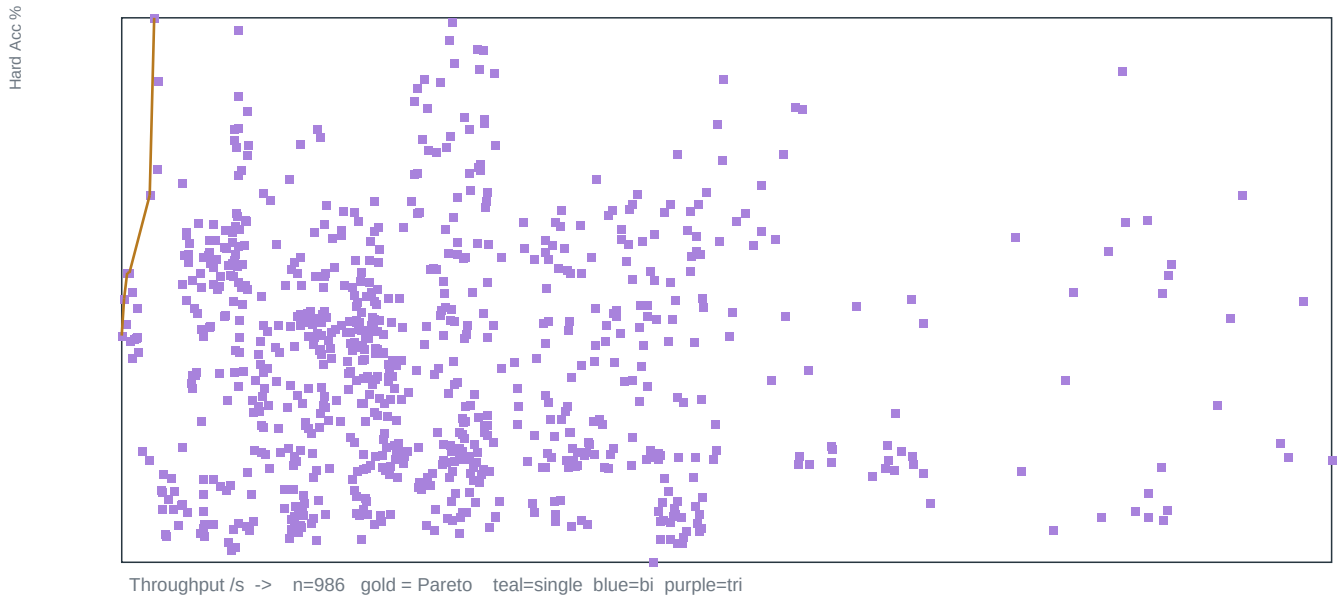
| | tricameratx3 |
|---|---|
| MeshBP | 21 |
| Mesh[T] | 18 |
| Mesh[T]Alt | 15 |
| Mesh[T]Chain | 21 |
| Mesh[T][S] | 26 |
| Mesh[T][S][FP] | 25 |
| Mesh[T][S]Sparse | 34 |
| Step[T]Alt | 14 |
| Step[T][S] | 21 |
| Step[T][S][FP] | 21 |
| Step[T][S][HP] | 21 |
| Step[T][S][HP]Async | 21 |
| Step[T][S][L] | 28 |
| Step[T][S][L]Cache | 28 |
| Step[T][S]Sparse | 22 |
| [T]Alt | 15 |
| [T][S] | 25 |
| [T][S][FP] | 25 |
| [T][S][HP] | 25 |
| [T][S][HP]Async | 25 |
| [T][S][L] | 33 |
| [T][S][L]Cache | 35 |
| [T][S]Sparse | 34 |
| sgd | 20 |
| step_sgd | 24 |
| step_tween | 20 |
| step_tween_chain | 24 |
| tween | 18 |
| tween_chain | 21 |

## Pillars - Availability vs hard Acc

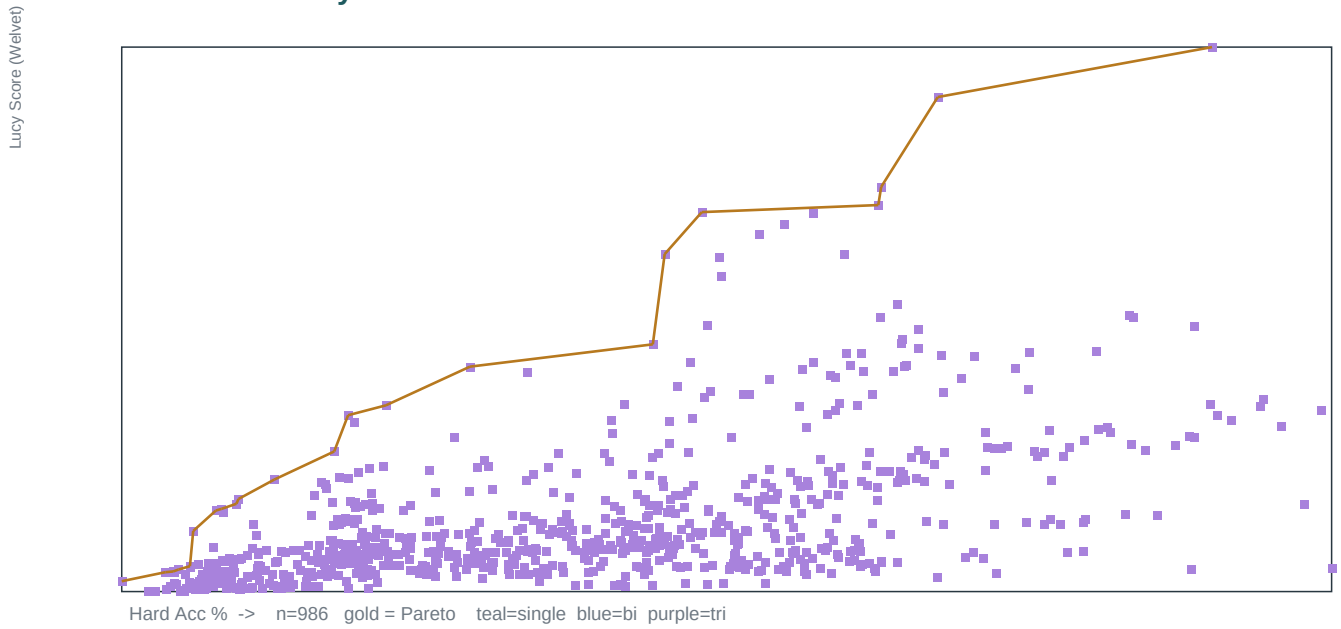



Availability % -> n=986 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

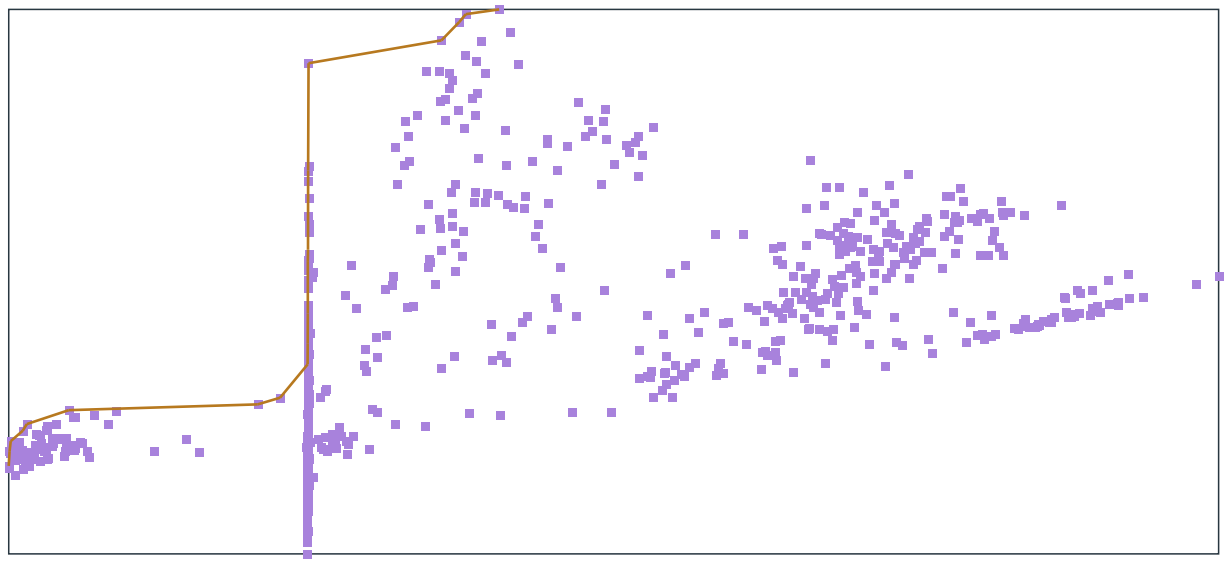
## Pillars - Throughput vs hard Acc




## Pareto - hard Acc vs Lucy Score

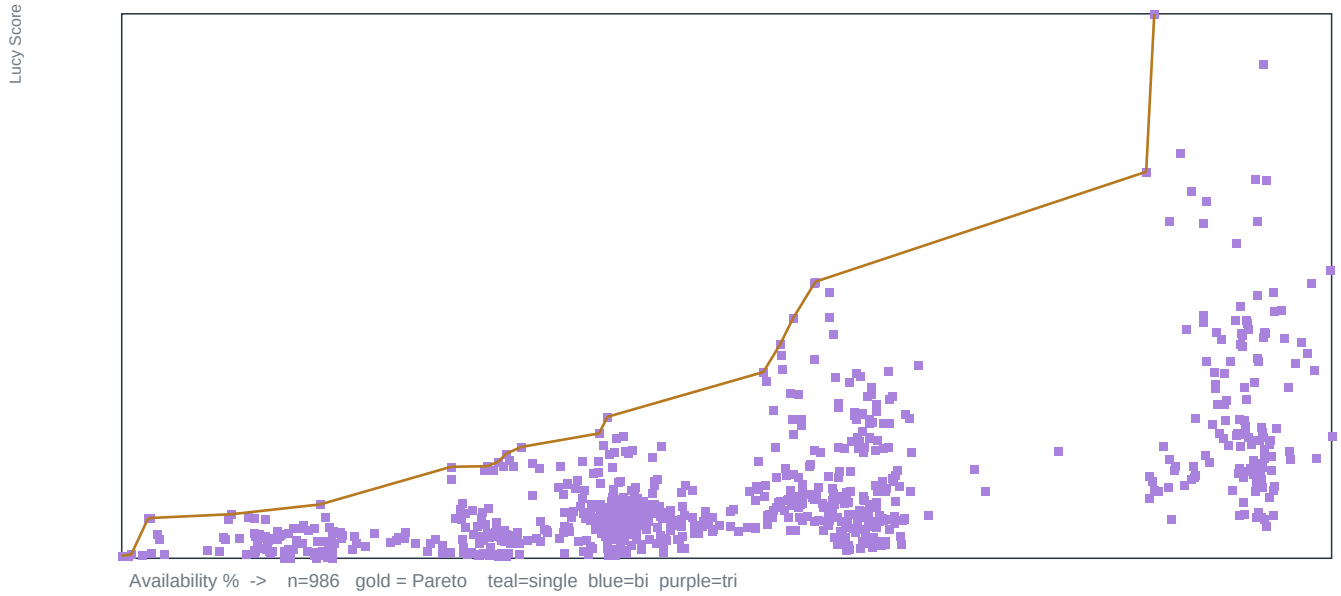



## SoftAcc (serve-confidence) vs hard Acc

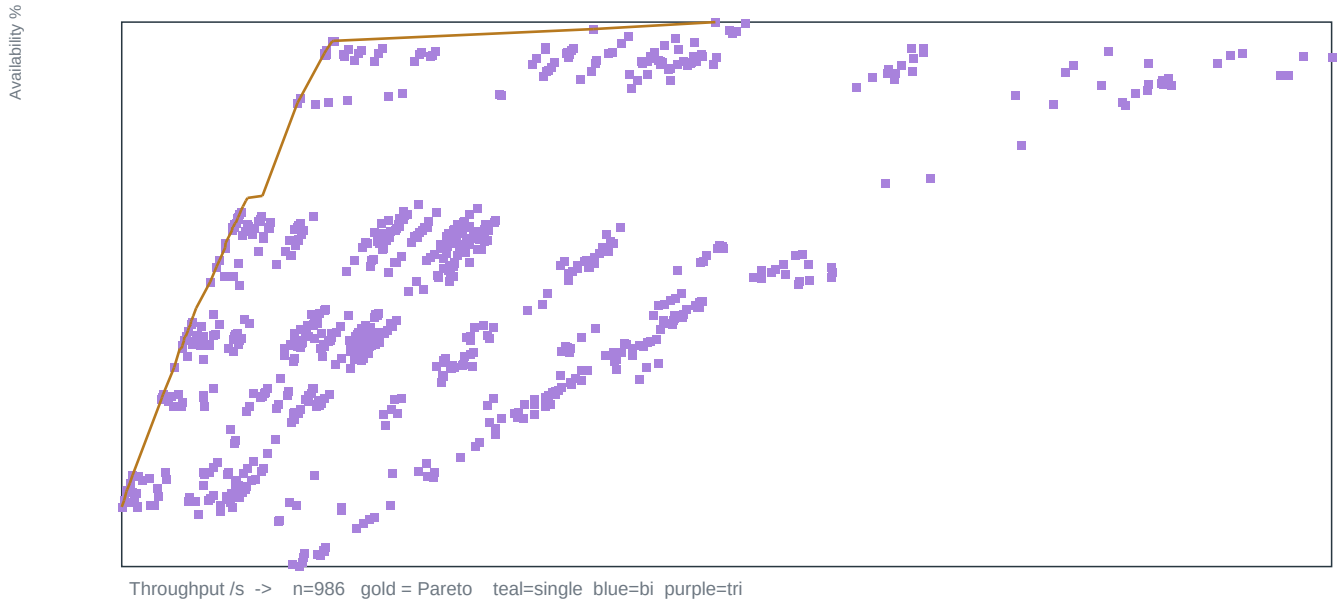



SoftAcc % -> n=986 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

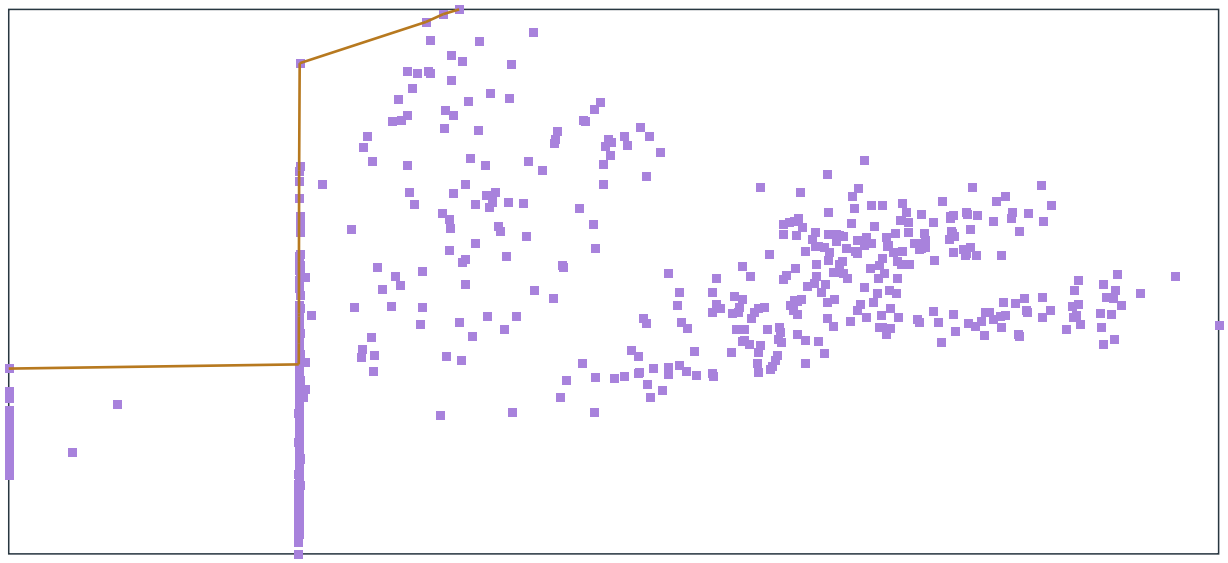
## Avail vs Lucy Score (duty clock)




## Pillars - Throughput vs Availability




## AdaptPct vs hard Acc



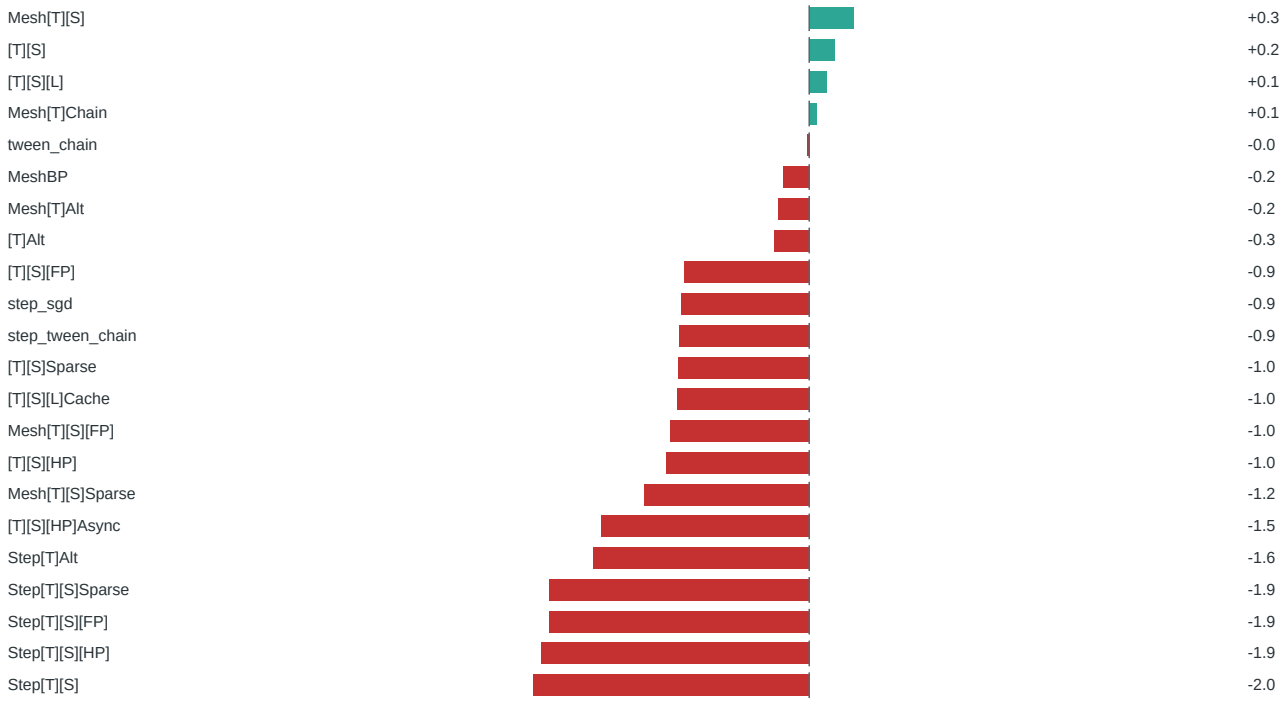

AdaptPct % -> n=986 gold = Pareto teal=single blue=bi purple=tri
Hard Acc %

## vs sgd - matched dtype x format x arch

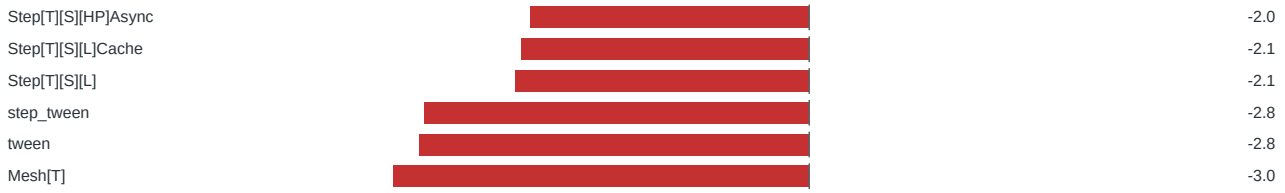
AccDelta is the honest column. ScoreDelta is usually Availability (duty clock), not a better chain rule. Acc win = AccDelta > 0.5. Score win = ScoreDelta > 1. Baseline is discovered from the board, not a frozen StepBP list.

| mode | n | AccD | Acc win% | SoftD | AvailD | ThruD | ScoreD | Score win% |
|---|---|---|---|---|---|---|---|---|
| Mesh[T][S] | 34 | +0.3 | 47 | -1.9 | +5.2 | +87 | +2.4 | 62 |
| [T][S] | 34 | +0.2 | 41 | -2.0 | +5.0 | +86 | +2.2 | 56 |
| [T][S][L] | 34 | +0.1 | 47 | -0.9 | +12.3 | +259 | +7.1 | 91 |
| Mesh[T]Chain | 34 | +0.1 | 29 | +0.0 | +0.3 | -0 | +0.2 | 6 |
| tween_chain | 34 | -0.0 | 12 | -0.0 | +0.3 | +1 | +0.1 | 9 |
| MeshBP | 34 | -0.2 | 15 | -0.0 | +0.4 | +2 | +0.0 | 6 |
| Mesh[T]Alt | 34 | -0.2 | 41 | -1.0 | -5.4 | -90 | -1.7 | 0 |
| [T]Alt | 34 | -0.3 | 41 | -1.0 | -5.7 | -93 | -1.8 | 0 |
| [T][S][FP] | 34 | -0.9 | 35 | -2.6 | +5.0 | +91 | +1.2 | 38 |
| step_sgd | 34 | -0.9 | 12 | -1.1 | +3.5 | +68 | +0.7 | 50 |
| step_tween_chain | 34 | -0.9 | 21 | -1.3 | +3.7 | +68 | +0.7 | 32 |
| [T][S]Sparse | 34 | -1.0 | 32 | -2.6 | +13.5 | +296 | +5.5 | 91 |
| [T][S][L]Cache | 34 | -1.0 | 26 | -1.8 | +14.2 | +310 | +6.3 | 88 |
| Mesh[T][S][FP] | 34 | -1.0 | 32 | -2.5 | +5.1 | +90 | +1.1 | 32 |
| [T][S][HP] | 34 | -1.0 | 32 | -2.5 | +5.0 | +91 | +1.1 | 35 |
| Mesh[T][S]Sparse | 34 | -1.2 | 26 | -2.7 | +13.5 | +292 | +4.7 | 85 |
| [T][S][HP]Async | 34 | -1.5 | 26 | -2.2 | +5.0 | +89 | +0.6 | 32 |
| Step[T]Alt | 34 | -1.6 | 24 | -2.7 | -6.0 | -106 | -2.1 | 0 |
| Step[T][S]Sparse | 34 | -1.9 | 12 | -2.7 | +1.2 | +11 | -0.8 | 6 |
| Step[T][S][FP] | 34 | -1.9 | 18 | -2.7 | +1.0 | +8 | -0.8 | 12 |
| Step[T][S][HP] | 34 | -1.9 | 18 | -2.7 | +0.3 | -4 | -1.0 | 9 |
| Step[T][S] | 34 | -2.0 | 15 | -2.7 | +1.0 | +12 | -0.9 | 12 |
| Step[T][S][HP]Async | 34 | -2.0 | 9 | -2.7 | +1.0 | +9 | -0.9 | 3 |
| Step[T][S][L]Cache | 34 | -2.1 | 3 | -2.7 | +7.4 | +140 | +0.9 | 50 |
| Step[T][S][L] | 34 | -2.1 | 9 | -2.7 | +7.4 | +140 | +0.9 | 44 |
| step_tween | 34 | -2.8 | 0 | -2.7 | +0.1 | -3 | -1.5 | 0 |
| tween | 34 | -2.8 | 0 | -2.7 | -2.6 | -49 | -2.0 | 0 |
| Mesh[T] | 34 | -3.0 | 0 | -2.7 | -2.3 | -46 | -2.0 | 0 |

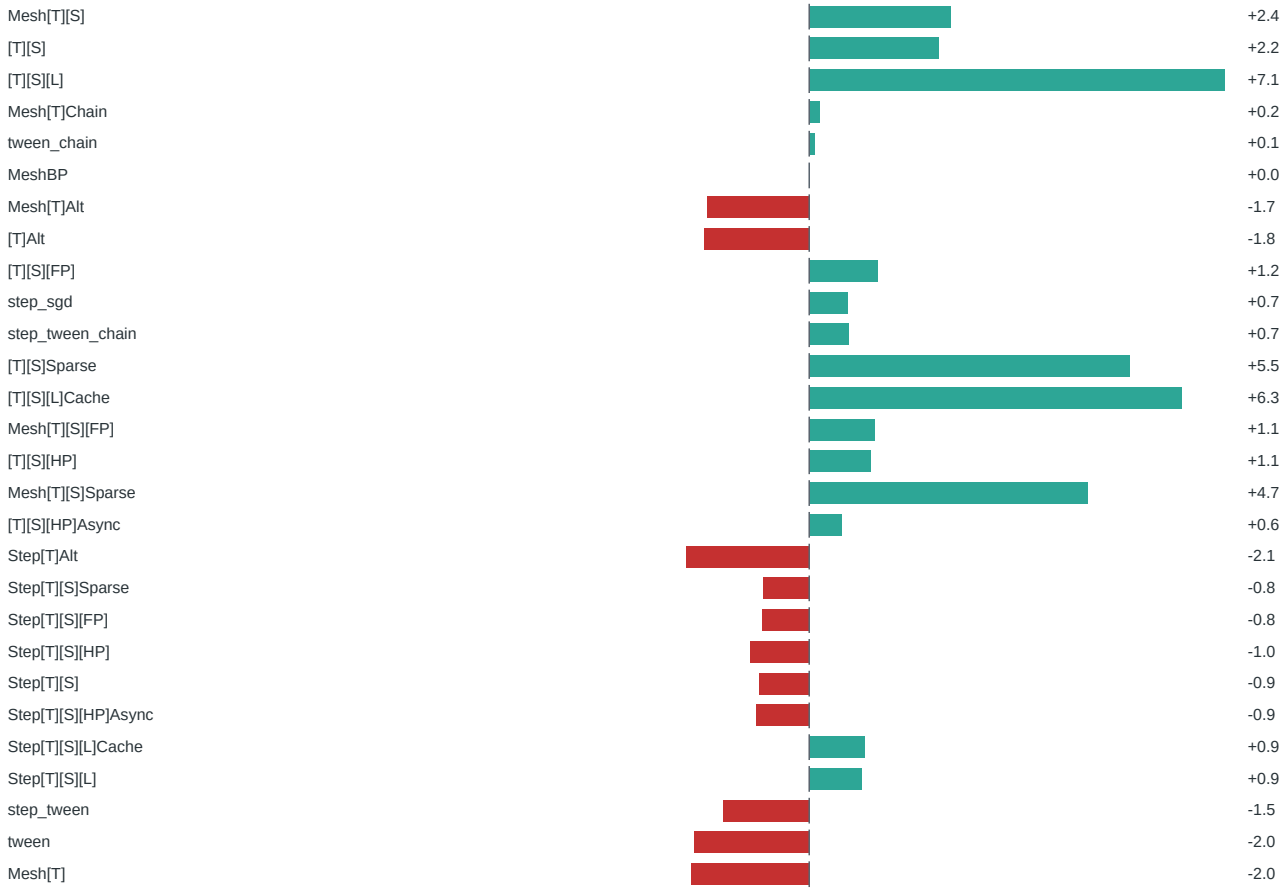
## mean AccD vs sgd



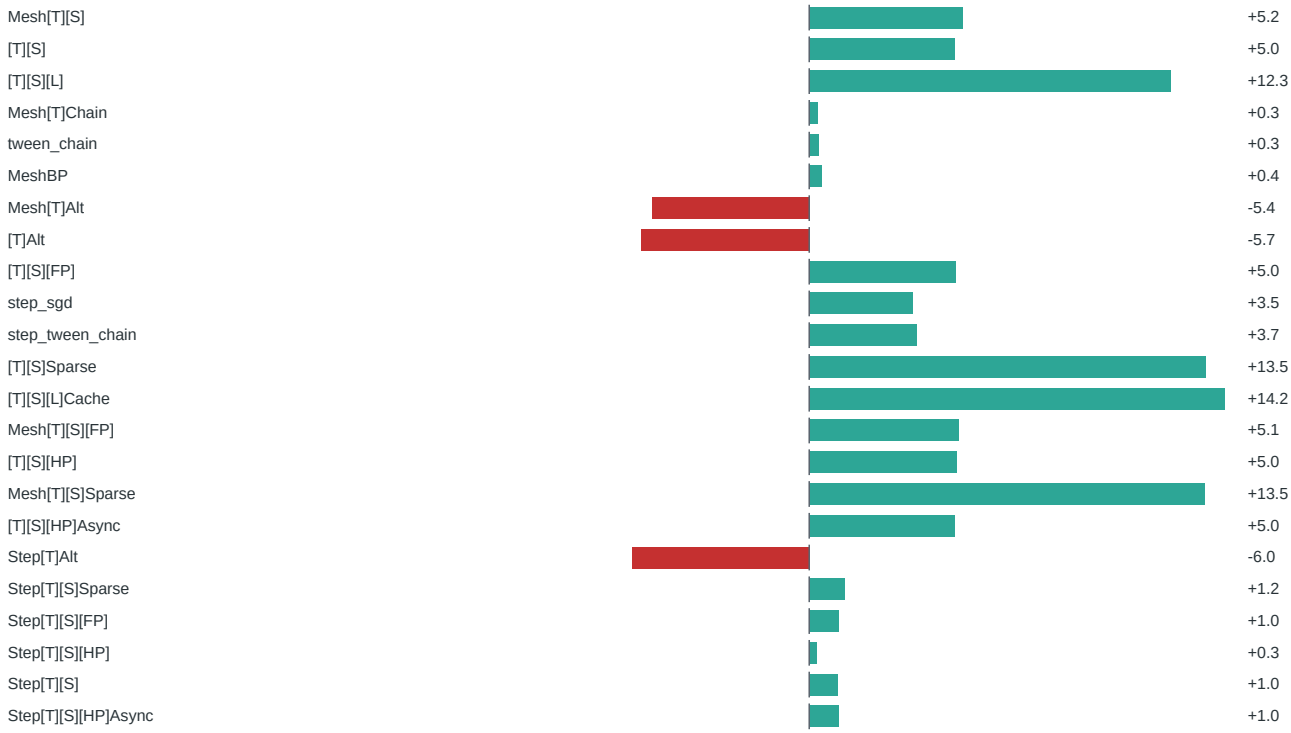
## mean AccD vs sgd




## mean ScoreD vs sgd (duty clock)




## mean AvailD vs sgd



## mean AvailD vs sgd




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

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

## AccD vs sgd, every mode x dtype  (cols 13-24)

## AccD vs sgd, every mode x dtype  (cols 13-24)

| | int16 | int2 | int3 | int32 | int4 | int5 | int6 | int64 | int8 | nf4 | ternary | uint |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MeshBP | +0 | +0 | +0 | +0 | -0 | +0 | -4 | -0 | -1 | +1 | +1 | -1 |
| Mesh[T] | -2 | -6 | -5 | -4 | -5 | -5 | -6 | -1 | -3 | -4 | -2 | -2 |
| Mesh[T]Alt | +3 | +2 | +2 | +1 | -2 | -1 | -2 | -1 | +1 | +1 | -2 | +2 |
| Mesh[T]Chain | +2 | +0 | +0 | -1 | -0 | -1 | -2 | -0 | +2 | +1 | +1 | -1 |
| Mesh[T][S] | +6 | -6 | -5 | +5 | -6 | -4 | +1 | +2 | +4 | -4 | -2 | +5 |
| Mesh[T][S][FP] | +4 | -6 | -5 | +2 | -5 | -4 | +1 | -3 | +3 | -4 | -2 | +4 |
| Mesh[T][S]Sparse | +2 | -6 | -4 | -1 | -1 | +1 | -2 | -3 | -2 | -1 | -2 | +3 |
| Step[T]Alt | -1 | -5 | -5 | -1 | -5 | -4 | -3 | +1 | -2 | -4 | -2 | +2 |
| Step[T][S] | +2 | -6 | -5 | -1 | -5 | -4 | -4 | +1 | -1 | -4 | -2 | -1 |
| Step[T][S][FP] | -1 | -6 | -5 | -1 | -6 | -4 | -5 | +1 | -2 | -4 | -2 | +0 |
| Step[T][S][HP] | +2 | -6 | -5 | -1 | -5 | -2 | -4 | -0 | -1 | -5 | -2 | +1 |
| Step[T][S][HP]Async | +0 | -6 | -5 | -1 | -5 | -3 | -6 | +0 | -2 | -3 | -2 | -1 |
| Step[T][S][L] | +0 | -6 | -4 | -2 | -5 | -4 | -5 | +2 | -2 | -4 | -2 | -1 |
| Step[T][S][L]Cache | +0 | -6 | -5 | -2 | -5 | -4 | -5 | -1 | -2 | -4 | -1 | -1 |
| Step[T][S]Sparse | +1 | -6 | -5 | -1 | -5 | -4 | -3 | +0 | -1 | -4 | -2 | -1 |
| [T]Alt | +2 | +2 | +1 | +0 | -1 | -1 | -2 | -0 | +2 | +1 | -2 | +2 |
| [T][S] | +6 | -6 | -5 | +5 | -5 | -3 | +0 | +2 | +4 | -4 | -2 | +5 |
| [T][S][FP] | +3 | -6 | -5 | +4 | -5 | -1 | -3 | -2 | +3 | -4 | -2 | +3 |
| [T][S][HP] | +2 | -6 | -5 | +3 | -5 | -2 | -1 | -3 | +2 | -4 | -2 | +4 |
| [T][S][HP]Async | +2 | -5 | -5 | +1 | -5 | -3 | -1 | -3 | +1 | -1 | -2 | +0 |
| [T][S][L] | +3 | -5 | -2 | +1 | +4 | -1 | +1 | +0 | +2 | -1 | -2 | +2 |
| [T][S][L]Cache | +1 | -6 | -4 | +2 | -1 | -3 | -3 | -2 | +2 | -2 | -1 | +2 |
| [T][S]Sparse | +2 | +0 | +2 | -0 | -0 | +1 | -1 | -3 | +1 | -4 | -2 | +3 |
| step_sgd | -0 | -0 | -0 | -0 | -1 | -1 | -2 | -2 | -1 | +0 | -1 | -1 |
| step_tween | -1 | -6 | -5 | -4 | -5 | -5 | -6 | -1 | -2 | -4 | -2 | -1 |
| step_tween_chain | +1 | -1 | +0 | +1 | -3 | -2 | -1 | -3 | +2 | -0 | +1 | -1 |
| tween | +0 | -6 | -5 | -4 | -5 | -5 | -6 | -2 | -2 | -4 | -1 | -1 |
| tween_chain | -0 | -0 | +0 | -0 | +0 | -0 | -1 | -1 | +0 | -0 | +0 | +1 |

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

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

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

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

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

| | bfloat16 | binary | complex128 | complex64 | float16 | float32 | float64 | fp4 | fp6 | fp8e4m3 | fp8e5m2 | int |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MeshBP | +0 | -0 | -0 | +0 | -0 | +0 | -0 | -0 | -0 | +0 | +0 | -0 |
| Mesh[T] | -1 | -5 | -1 | -1 | -2 | -2 | -3 | -1 | -2 | -2 | -2 | -1 |
| Mesh[T]Alt | -2 | -5 | -1 | -1 | -2 | -2 | -2 | -1 | -1 | -2 | -1 | -2 |
| Mesh[T]Chain | -0 | -1 | -0 | +0 | -0 | +1 | +0 | -0 | -0 | -0 | -0 | -0 |
| Mesh[T][S] | +4 | -3 | +2 | +1 | +2 | +3 | +2 | +1 | +3 | +2 | -0 | +3 |
| Mesh[T][S][FP] | +0 | -3 | -0 | -0 | -0 | -1 | -1 | +1 | +0 | +0 | -0 | -1 |
| Mesh[T][S]Sparse | +2 | -2 | +2 | +2 | +3 | +5 | +2 | +3 | +5 | +2 | +3 | +2 |
| Step[T]Alt | -1 | -5 | -2 | -1 | -1 | -2 | -2 | -2 | -1 | -2 | -2 | -1 |
| Step[T][S] | +3 | -4 | -1 | +0 | -0 | +2 | +0 | -1 | -1 | -2 | -2 | +1 |
| Step[T][S][FP] | -0 | -4 | +1 | -0 | +1 | +2 | +1 | -0 | -1 | -2 | -1 | +0 |
| Step[T][S][HP] | +1 | -4 | +0 | +0 | +1 | +1 | -1 | -1 | -1 | -2 | -1 | -1 |
| Step[T][S][HP]Async | +2 | -4 | +1 | +0 | -1 | +0 | -0 | -0 | -1 | -2 | -1 | +0 |
| Step[T][S][L] | +6 | -2 | +3 | +2 | +1 | +5 | +3 | +1 | -0 | -1 | +1 | +1 |
| Step[T][S][L]Cache | +3 | -2 | +1 | +3 | +2 | +5 | +3 | +2 | +1 | -1 | +0 | +3 |
| Step[T][S]Sparse | +1 | -4 | +0 | +0 | +0 | +1 | +0 | -0 | -1 | -2 | -1 | -0 |
| [T]Alt | -2 | -5 | -2 | -1 | -2 | -2 | -3 | -1 | -1 | -2 | -1 | -2 |
| [T][S] | +4 | -5 | +1 | +1 | +2 | +2 | +2 | +0 | +3 | +1 | -0 | +2 |
| [T][S][FP] | -0 | -3 | -0 | -0 | +0 | -0 | -1 | +0 | +2 | +0 | +0 | -0 |
| [T][S][HP] | -0 | -3 | -1 | -0 | +0 | -1 | -0 | +1 | +2 | +1 | +0 | -0 |
| [T][S][HP]Async | -0 | -4 | -1 | -0 | -1 | -1 | -1 | +1 | +2 | +0 | +0 | -1 |
| [T][S][L] | +9 | -0 | +5 | +6 | +8 | +16 | +11 | +4 | +3 | -0 | +11 | +5 |
| [T][S][L]Cache | +5 | +1 | +4 | +3 | +4 | +5 | +10 | +4 | +3 | +5 | +7 | +3 |
| [T][S]Sparse | +3 | -1 | +1 | +2 | +2 | +5 | +3 | +5 | +4 | +2 | +2 | +1 |
| step_sgd | +2 | +0 | -1 | +1 | -1 | -1 | +1 | +0 | -0 | -0 | -1 | -1 |
| step_tween | +0 | -5 | -1 | -1 | -1 | -2 | -1 | -1 | -1 | -2 | -2 | -1 |
| step_tween_chain | -1 | -0 | -0 | +1 | -1 | -1 | -1 | +0 | +0 | -0 | -0 | +1 |
| tween | -1 | -4 | -1 | -1 | -2 | -3 | -2 | -1 | -2 | -2 | -2 | -2 |
| tween_chain | +0 | -0 | +0 | +0 | -0 | +1 | -0 | -1 | -0 | -0 | +0 | -0 |

## ScoreD vs sgd, every mode x dtype  (cols 13-24)

## ScoreD vs sgd, every mode x dtype  (cols 13-24)

| | int16 | int2 | int3 | int32 | int4 | int5 | int6 | int64 | int8 | nf4 | ternary | uint |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MeshBP | +0 | +1 | +0 | -0 | +0 | +0 | -1 | +0 | -1 | +0 | +1 | -1 |
| Mesh[T] | -2 | -4 | -2 | -3 | -4 | -2 | -2 | -1 | -3 | -2 | -2 | -1 |
| Mesh[T]Alt | -1 | -3 | -1 | -2 | -4 | -1 | -1 | -1 | -3 | -2 | -2 | -1 |
| Mesh[T]Chain | +1 | +1 | -0 | -0 | +0 | -0 | -1 | +0 | +3 | +0 | +1 | -1 |
| Mesh[T][S] | +8 | -4 | -1 | +6 | -4 | -0 | +2 | +3 | +10 | -2 | -1 | +6 |
| Mesh[T][S][FP] | +5 | -3 | -1 | +5 | -4 | -0 | +2 | -0 | +7 | -2 | -0 | +5 |
| Mesh[T][S]Sparse | +10 | -0 | +0 | +4 | +14 | +5 | +3 | +2 | +8 | +4 | +2 | +11 |
| Step[T]Alt | -2 | -5 | -2 | -2 | -5 | -1 | -2 | -1 | -4 | -3 | -2 | -1 |
| Step[T][S] | +2 | -4 | -2 | -1 | -4 | -1 | -1 | +1 | -1 | -2 | -1 | -0 |
| Step[T][S][FP] | -0 | -4 | -2 | -0 | -4 | -1 | -1 | +1 | -2 | -2 | -1 | +0 |
| Step[T][S][HP] | +1 | -4 | -2 | -0 | -4 | -1 | -1 | -0 | -1 | -2 | -1 | +0 |
| Step[T][S][HP]Async | +1 | -4 | -2 | -1 | -4 | -1 | -1 | +1 | -2 | -2 | -2 | -0 |
| Step[T][S][L] | +3 | -3 | -1 | +0 | -2 | -0 | -1 | +5 | +2 | -2 | +0 | +1 |
| Step[T][S][L]Cache | +3 | -2 | -2 | +1 | -2 | -1 | -1 | +3 | +2 | -1 | +1 | +1 |
| Step[T][S]Sparse | +1 | -4 | -2 | -1 | -4 | -1 | -0 | +1 | -1 | -2 | -1 | -1 |
| [T]Alt | -1 | -3 | -1 | -2 | -4 | -1 | -2 | -1 | -3 | -2 | -2 | -1 |
| [T][S] | +6 | -4 | -2 | +7 | -4 | -0 | +2 | +4 | +10 | -2 | -1 | +6 |
| [T][S][FP] | +4 | -4 | -1 | +6 | -3 | +1 | +0 | +0 | +8 | -1 | -1 | +4 |
| [T][S][HP] | +4 | -4 | -2 | +5 | -3 | +1 | +1 | -0 | +5 | -1 | -1 | +5 |
| [T][S][HP]Async | +4 | -3 | -1 | +3 | -3 | -0 | +1 | -0 | +5 | +1 | -0 | +2 |
| [T][S][L] | +10 | +1 | +2 | +9 | +26 | +2 | +4 | +7 | +17 | +3 | +2 | +8 |
| [T][S][L]Cache | +9 | +0 | -0 | +11 | +14 | +2 | +3 | +4 | +23 | +3 | +6 | +10 |
| [T][S]Sparse | +9 | +18 | +7 | +6 | +15 | +5 | +4 | +2 | +16 | -0 | +2 | +10 |
| step_sgd | +1 | +2 | +1 | +1 | +1 | +0 | +0 | -0 | +1 | +1 | -0 | +1 |
| step_tween | -0 | -4 | -2 | -2 | -4 | -2 | -2 | -1 | -1 | -2 | -1 | -0 |
| step_tween_chain | +2 | +2 | +1 | +2 | -1 | -0 | +1 | -1 | +5 | +1 | +2 | +1 |
| tween | -1 | -5 | -2 | -3 | -4 | -2 | -2 | -2 | -3 | -2 | -1 | -1 |
| tween_chain | -0 | +0 | +0 | -0 | +0 | -0 | -0 | -0 | +0 | -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 | +1 | +2 | +0 | -0 | -0 | -0 | -0 | -0 | +1 | -0 |
| Mesh[T] | -1 | -1 | -2 | -2 | -3 | -2 | -1 | -1 | -3 | -1 |
| Mesh[T]Alt | -1 | -2 | -1 | -1 | -2 | -2 | -1 | -1 | -3 | -1 |
| Mesh[T]Chain | +1 | +1 | -0 | +0 | -0 | -0 | +0 | +0 | +1 | +0 |
| Mesh[T][S] | +7 | +0 | -1 | +8 | -2 | -0 | +3 | +7 | +9 | +6 |
| Mesh[T][S][FP] | +6 | -0 | -2 | +6 | -1 | -1 | +3 | +7 | +7 | +6 |
| Mesh[T][S]Sparse | +13 | +1 | +0 | +9 | +4 | +5 | +5 | +12 | +13 | +6 |
| Step[T]Alt | -1 | -1 | -2 | -2 | -3 | -2 | -1 | -1 | -3 | -2 |
| Step[T][S] | +0 | -1 | -2 | -1 | -3 | -1 | -1 | -0 | -2 | -1 |
| Step[T][S][FP] | +1 | -1 | -2 | +0 | -2 | -1 | -1 | +0 | -2 | -0 |
| Step[T][S][HP] | -0 | -1 | -2 | -1 | -3 | -2 | -1 | +0 | -2 | -1 |
| Step[T][S][HP]Async | +1 | -1 | -2 | -0 | -3 | -1 | -1 | +1 | -2 | +0 |
| Step[T][S][L] | +2 | -0 | -1 | +4 | -2 | -1 | +1 | +2 | +3 | +2 |
| Step[T][S][L]Cache | +2 | +0 | -1 | +4 | -2 | -0 | -0 | +3 | +2 | +3 |
| Step[T][S]Sparse | +1 | -1 | -2 | -0 | -3 | -1 | -0 | +1 | -1 | -0 |
| [T]Alt | -1 | -1 | -1 | -1 | -2 | -2 | -1 | -1 | -3 | -1 |
| [T][S] | +8 | -0 | -1 | +7 | -2 | -1 | +3 | +8 | +10 | +6 |
| [T][S][FP] | +4 | -0 | -1 | +4 | +4 | +2 | +1 | +6 | +6 | +5 |
| [T][S][HP] | +6 | -1 | -1 | +5 | -0 | +0 | +1 | +6 | +8 | +4 |
| [T][S][HP]Async | +4 | -0 | -1 | +3 | -1 | +2 | -0 | +4 | +5 | +4 |
| [T][S][L] | +11 | +3 | +3 | +10 | +6 | +2 | +3 | +12 | +14 | +9 |
| [T][S][L]Cache | +13 | +3 | +1 | +13 | +7 | +0 | +2 | +9 | +17 | +10 |
| [T][S]Sparse | +11 | +2 | -0 | +8 | +4 | +5 | +4 | +11 | +8 | +10 |
| step_sgd | +2 | +1 | +1 | +1 | +2 | -0 | +1 | +1 | +4 | +1 |
| step_tween | -1 | -0 | -2 | -1 | -3 | -2 | -1 | +1 | -2 | -1 |
| step_tween_chain | +3 | +2 | -0 | +1 | +0 | -1 | +0 | +2 | +3 | +1 |
| tween | -1 | -1 | -2 | -1 | -3 | -2 | -1 | -1 | -3 | -1 |
| tween_chain | +1 | +2 | -0 | -0 | -0 | -0 | -0 | +0 | +1 | -1 |

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

## AvailD vs sgd, every mode x dtype  (cols 13-24)

## AvailD vs sgd, every mode x dtype  (cols 13-24)

| | int16 | int2 | int3 | int32 | int4 | int5 | int6 | int64 | int8 | nf4 | ternary | uint |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MeshBP | +1 | +1 | -0 | -0 | +1 | +0 | +1 | +1 | +1 | -0 | +0 | -0 |
| Mesh[T] | -2 | -1 | -3 | -2 | -2 | -2 | -2 | -2 | -2 | -4 | -3 | -2 |
| Mesh[T]Alt | -7 | -6 | -7 | -7 | -7 | -7 | -7 | -4 | -7 | -8 | -7 | -8 |
| Mesh[T]Chain | +0 | +1 | -0 | +0 | +1 | +0 | +0 | +1 | +1 | -1 | +0 | -0 |
| Mesh[T][S] | +6 | +5 | +5 | +5 | +4 | +6 | +6 | +5 | +5 | +5 | +4 | +5 |
| Mesh[T][S][FP] | +5 | +5 | +5 | +6 | +5 | +5 | +6 | +5 | +5 | +4 | +5 | +6 |
| Mesh[T][S]Sparse | +13 | +15 | +13 | +13 | +15 | +14 | +14 | +13 | +14 | +12 | +15 | +13 |
| Step[T]Alt | -6 | -5 | -6 | -6 | -6 | -6 | -6 | -6 | -6 | -7 | -6 | -6 |
| Step[T][S] | +1 | +2 | -0 | +0 | +2 | +1 | +1 | +2 | +1 | -1 | +2 | +1 |
| Step[T][S][FP] | +1 | +1 | +1 | +1 | +1 | +1 | +1 | +2 | +1 | -0 | +1 | +1 |
| Step[T][S][HP] | +0 | +1 | -1 | +0 | +0 | -0 | +0 | +0 | +0 | -1 | -0 | -1 |
| Step[T][S][HP]Async | +1 | +1 | +1 | +1 | +1 | +1 | +1 | +2 | +1 | -0 | +1 | +1 |
| Step[T][S][L] | +7 | +9 | +6 | +6 | +10 | +6 | +7 | +7 | +8 | +5 | +9 | +8 |
| Step[T][S][L]Cache | +7 | +8 | +6 | +7 | +9 | +7 | +7 | +8 | +8 | +5 | +10 | +7 |
| Step[T][S]Sparse | +1 | +1 | +1 | +0 | +1 | +2 | +2 | +2 | +1 | +0 | +1 | +1 |
| [T]Alt | -7 | -6 | -8 | -8 | -7 | -7 | -7 | -5 | -7 | -8 | -7 | -7 |
| [T][S] | +4 | +4 | +5 | +5 | +4 | +6 | +6 | +5 | +5 | +4 | +5 | +5 |
| [T][S][FP] | +5 | +4 | +5 | +5 | +5 | +6 | +6 | +6 | +5 | +4 | +5 | +5 |
| [T][S][HP] | +5 | +5 | +4 | +5 | +5 | +6 | +5 | +5 | +5 | +4 | +5 | +5 |
| [T][S][HP]Async | +5 | +4 | +5 | +5 | +5 | +5 | +6 | +6 | +4 | +4 | +5 | +5 |
| [T][S][L] | +12 | +13 | +11 | +13 | +14 | +11 | +12 | +13 | +12 | +11 | +11 | +12 |
| [T][S][L]Cache | +14 | +15 | +13 | +13 | +16 | +14 | +14 | +15 | +15 | +13 | +15 | +14 |
| [T][S]Sparse | +13 | +15 | +13 | +13 | +15 | +13 | +14 | +13 | +13 | +12 | +15 | +13 |
| step_sgd | +4 | +3 | +4 | +4 | +4 | +3 | +4 | +4 | +4 | +3 | +2 | +3 |
| step_tween | +1 | +1 | -1 | -0 | +0 | +0 | -1 | +1 | +1 | -1 | -1 | +0 |
| step_tween_chain | +4 | +3 | +3 | +4 | +3 | +4 | +5 | +4 | +4 | +3 | +2 | +4 |
| tween | -3 | -2 | -3 | -4 | -2 | -3 | -2 | -2 | -2 | -4 | -3 | -3 |
| tween_chain | -0 | +1 | +1 | +0 | +0 | +0 | +0 | +0 | +0 | -1 | +0 | -0 |

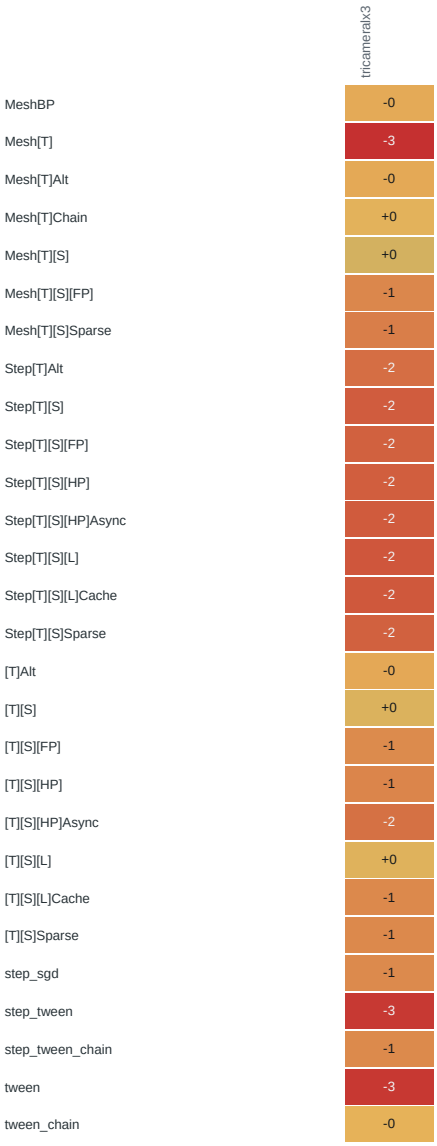
## AvailD vs sgd, every mode x dtype  (cols 25-34)

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

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

## AccD vs sgd, every mode x arch

## AccD vs sgd, every mode x arch




## Family collapse - Step* vs non-Step

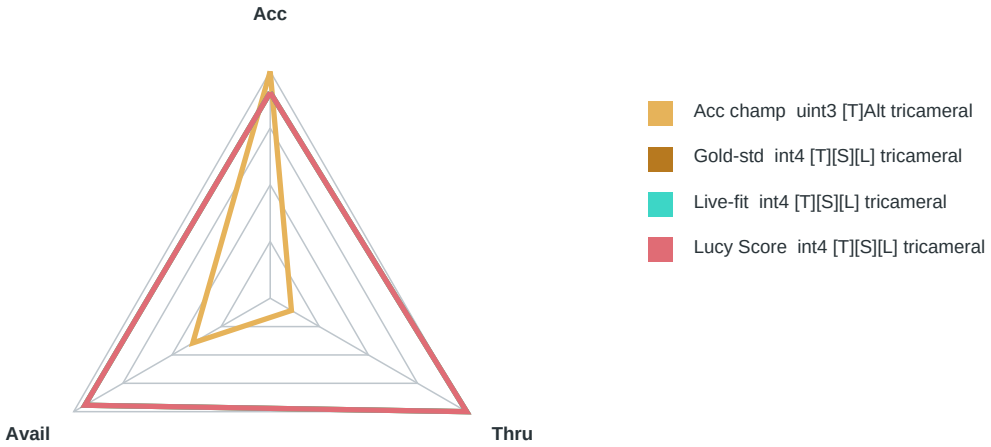
Step* is a 1D pipe (one sample enters layer 0 per tick; output is the sample that entered depth ticks ago). Non-Step of the same family is a full-chain update. AccD is a real scheduler split, not leftover warm-up forwards.

| step | plain | n | mean \|AccD\| |
|---|---|---|---|
| Step[T]Alt | [T]Alt | 34 | 3.02 |
| Step[T][S] | [T][S] | 34 | 2.62 |
| Step[T][S][FP] | [T][S][FP] | 34 | 2.47 |
| Step[T][S][HP] | [T][S][HP] | 34 | 2.21 |
| Step[T][S][HP]Async | [T][S][HP]Async | 34 | 2.08 |
| Step[T][S][L] | [T][S][L] | 34 | 2.49 |
| Step[T][S][L]Cache | [T][S][L]Cache | 34 | 1.83 |
| Step[T][S]Sparse | [T][S]Sparse | 34 | 2.34 |
| step_sgd | sgd | 34 | 1.23 |
| step_tween | tween | 34 | 0.50 |
| step_tween_chain | tween_chain | 34 | 1.34 |

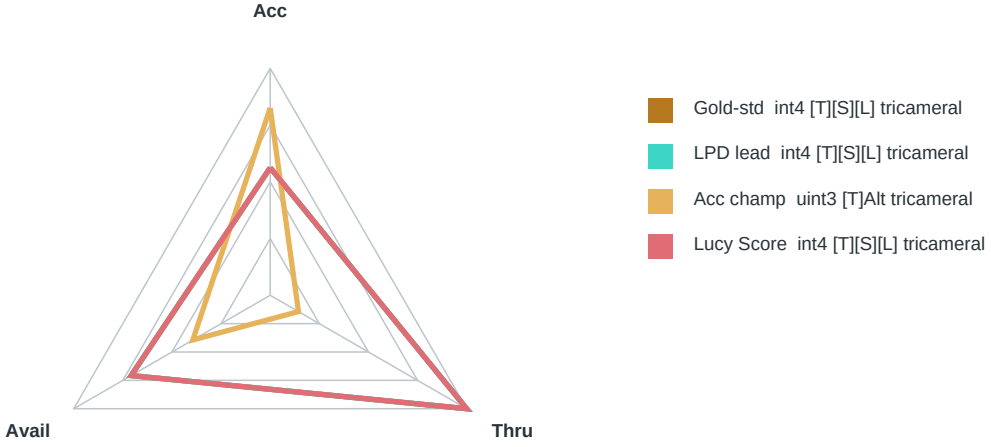
## Consciousness - Acc, Throughput, Availability

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 uint3|none|[T]Alt|tricameral|simd  Acc 11.4  Thru 101  Avail 13.4%  32.3 KiB  (RAM reference)
Lucy Score champ (T x Avail x Acc) int4|none|[T][S][L]|tricameral|simd  Score 31.1  Acc 10.4  Soft 2  43.0 KiB
Live-fit champ (best Q) int4|none|[T][S][L]|tricameral|simd  Acc 10.4  Thru 936  Avail 32.1%  43.0 KiB
Gold-std (2+ pillars, Acc keep >= 80%, then smallest then fastest): int4|none|[T][S][L]|tricameral|simd  mode [T][S][L]  Acc 10.4  Thru 936  43.0 KiB
Board fastest float32|none|[T][S][L]Cache|tricameral|simd  Thru 1117 (traps may own this)  Best availability int64|none|[T][S][L]Cache|tricameral|simd  35.8%
Learner Thru peak 936  learner Avail peak 34.0%

## 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 |
|---|---|---|---|---|---|
| [T][S][L] | 1 | 10.4 | 43.0 | 936 | int4 [T][S][L] tricameral |

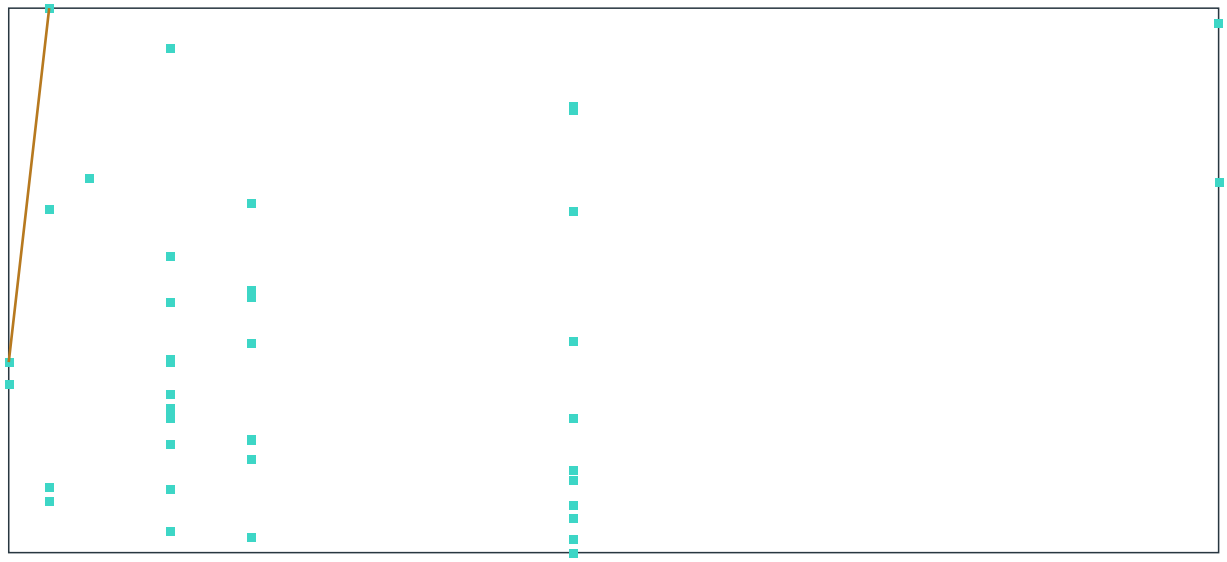
## Lucy density (LPD) - Q x shrink vs Acc-champ RAM; 0 if Acc keep < 70%

| Band | Cell | Acc% | Thru% | Avail% | Q% | RAM% | xSmall | LPD | Acc | Thru | KiB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| keep | int4 [T][S][L] tricameral | 91 | 100 | 94 | 95 | 133 | 0.8 | 0.71 | 10.4 | 936 | 43.0 |
| - | int3 [T][S]Sparse tricameral | 73 | 35 | 100 | 63 | 100 | 1.0 | 0.63 | 8.3 | 326 | 32.3 |
| acc | int2 Mesh[T]Alt tricameral | 81 | 26 | 33 | 41 | 67 | 1.5 | 0.61 | 9.2 | 242 | 21.5 |
| - | int2 [T]Alt tricameral | 79 | 26 | 33 | 41 | 67 | 1.5 | 0.61 | 9.1 | 244 | 21.5 |
| acc | uint3 [T]Alt tricameral | 100 | 11 | 39 | 35 | 100 | 1.0 | 0.35 | 11.4 | 101 | 32.3 |
| acc | uint3 Mesh[T]Alt tricameral | 89 | 11 | 41 | 34 | 100 | 1.0 | 0.34 | 10.2 | 104 | 32.3 |
| - | int3 Mesh[T]Alt tricameral | 74 | 11 | 42 | 32 | 100 | 1.0 | 0.32 | 8.4 | 104 | 32.3 |
| acc | int8 [T][S] tricameral | 84 | 71 | 74 | 76 | 266 | 0.4 | 0.28 | 9.6 | 661 | 86.1 |
| acc | int8 Mesh[T][S] tricameral | 85 | 70 | 73 | 76 | 266 | 0.4 | 0.28 | 9.7 | 655 | 86.1 |
| - | int6 [T][S][L] tricameral | 78 | 24 | 95 | 56 | 200 | 0.5 | 0.28 | 8.9 | 227 | 64.6 |
| acc | uint8 [T][S] tricameral | 89 | 63 | 74 | 75 | 266 | 0.4 | 0.28 | 10.2 | 592 | 86.1 |
| acc | uint8 Mesh[T][S] tricameral | 82 | 63 | 74 | 73 | 266 | 0.4 | 0.27 | 9.3 | 587 | 86.1 |
| - | int8 [T][S][FP] tricameral | 76 | 69 | 72 | 72 | 266 | 0.4 | 0.27 | 8.7 | 644 | 86.1 |
| - | uint8 [T][S][HP] tricameral | 75 | 63 | 75 | 71 | 266 | 0.4 | 0.27 | 8.6 | 591 | 86.1 |
| - | int8 Mesh[T][S][FP] tricameral | 71 | 67 | 71 | 70 | 266 | 0.4 | 0.26 | 8.1 | 625 | 86.1 |
| acc | fp6 Mesh[T][S] tricameral | 98 | 19 | 79 | 52 | 200 | 0.5 | 0.26 | 11.2 | 173 | 64.6 |
| - | uint8 Mesh[T][S][FP] tricameral | 76 | 59 | 71 | 69 | 266 | 0.4 | 0.26 | 8.7 | 553 | 86.1 |
| acc | uint6 Mesh[T][S][FP] tricameral | 84 | 19 | 78 | 50 | 200 | 0.5 | 0.25 | 9.6 | 182 | 64.6 |
| acc | fp6 [T][S] tricameral | 86 | 19 | 78 | 50 | 200 | 0.5 | 0.25 | 9.9 | 173 | 64.6 |
| acc | int6 Mesh[T][S] tricameral | 81 | 19 | 79 | 49 | 200 | 0.5 | 0.25 | 9.2 | 174 | 64.6 |

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

| Band | Cell | Acc% | Thru% | Avail% | Q% | LPD | Thru | Avail |
|---|---|---|---|---|---|---|---|---|
| keep | int4 [T][S][L] tricameral | 91 | 100 | 94 | 95 | 0.71 | 936 | 32.1 |
| acc | int8 [T][S] tricameral | 84 | 71 | 74 | 76 | 0.28 | 661 | 25.0 |
| acc | int8 Mesh[T][S] tricameral | 85 | 70 | 73 | 76 | 0.28 | 655 | 25.0 |
| acc | uint8 [T][S] tricameral | 89 | 63 | 74 | 75 | 0.28 | 592 | 25.3 |
| acc | uint8 Mesh[T][S] tricameral | 82 | 63 | 74 | 73 | 0.27 | 587 | 25.3 |
| - | int8 [T][S][FP] tricameral | 76 | 69 | 72 | 72 | 0.27 | 644 | 24.6 |
| - | uint Mesh[T][S]Sparse tricameral | 72 | 52 | 100 | 72 | 0.03 | 483 | 34.0 |
| - | uint8 [T][S][HP] tricameral | 75 | 63 | 75 | 71 | 0.27 | 591 | 25.4 |
| - | int8 Mesh[T][S][FP] tricameral | 71 | 67 | 71 | 70 | 0.26 | 625 | 24.3 |
| - | uint8 Mesh[T][S][FP] tricameral | 76 | 59 | 71 | 69 | 0.26 | 553 | 24.3 |

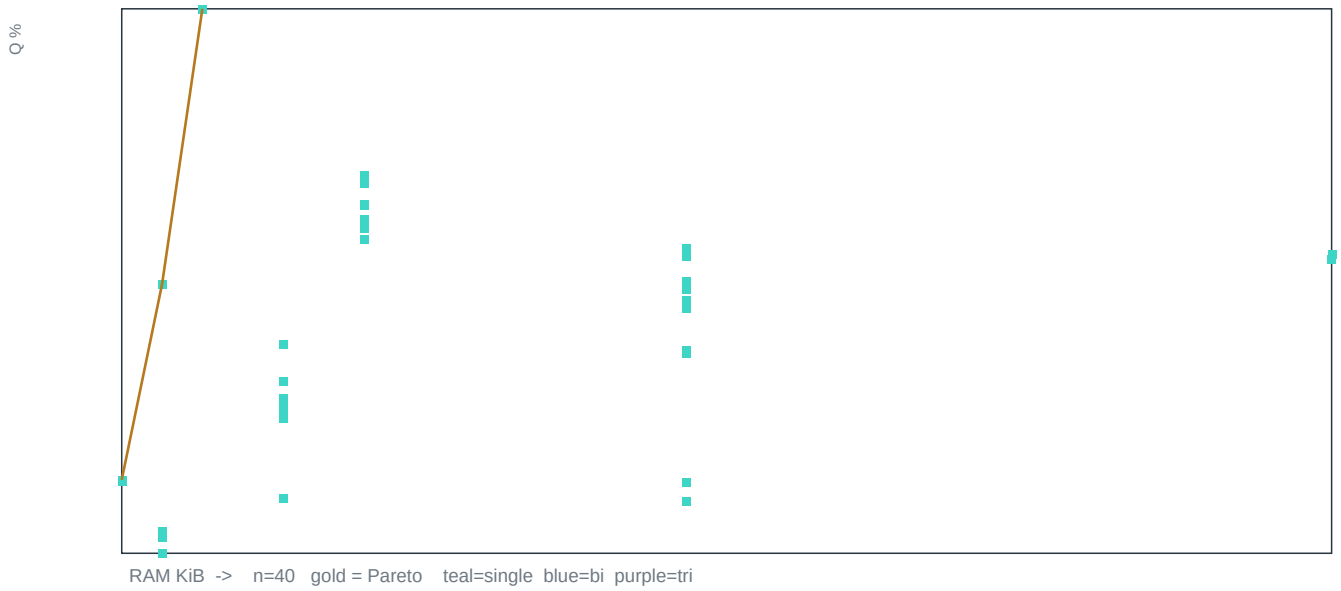
## Acc keep % vs RAM KiB (gold = high Acc, low RAM vs Acc champ)



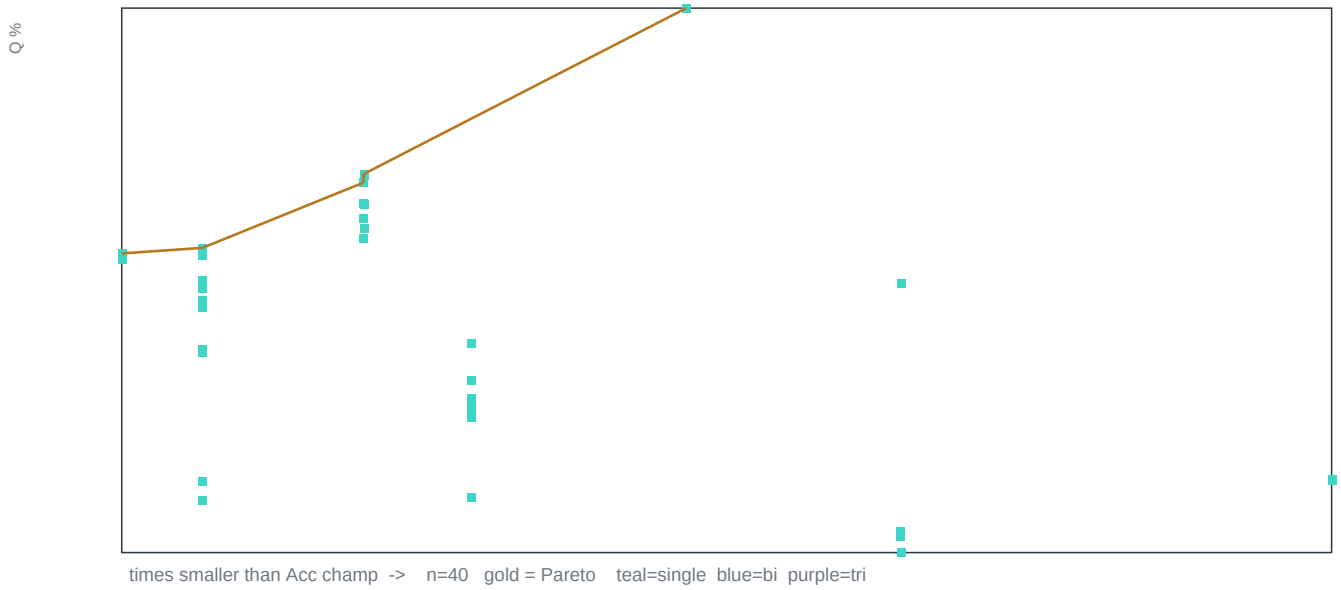
RAM KiB  ->  n=40  gold = Pareto  teal=single  blue=bi  purple=tri

Acc keep % vs Acc champ

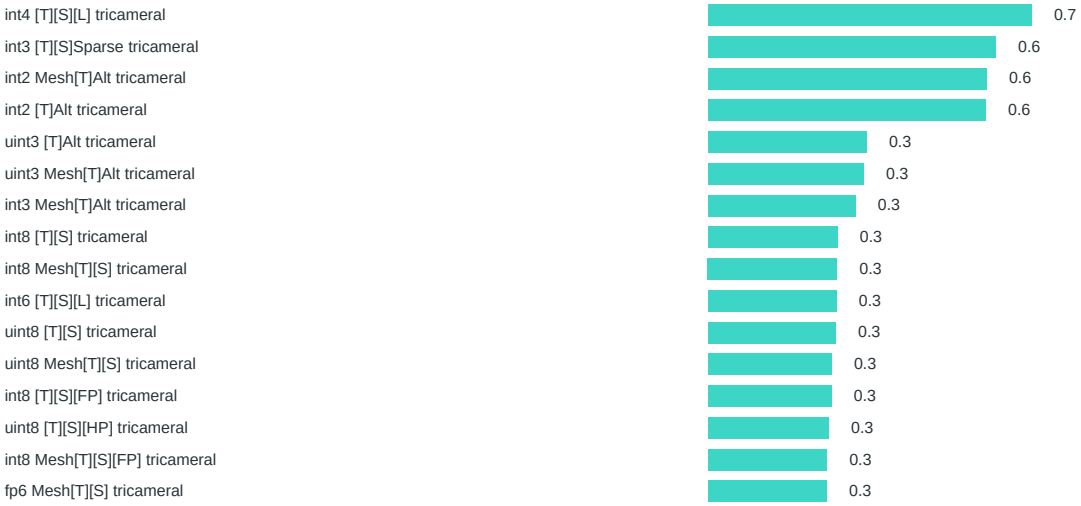
## Q% vs RAM KiB (gold = high consciousness, low RAM)



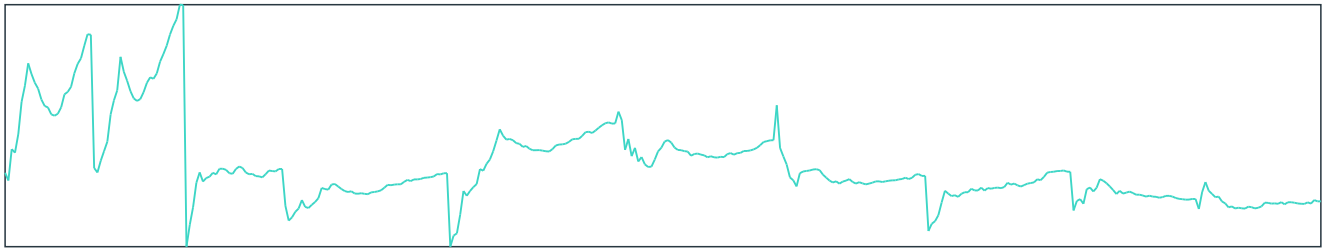

## Q% vs shrink vs Acc champ (gold = upper right)




## Top Lucy density (LPD)

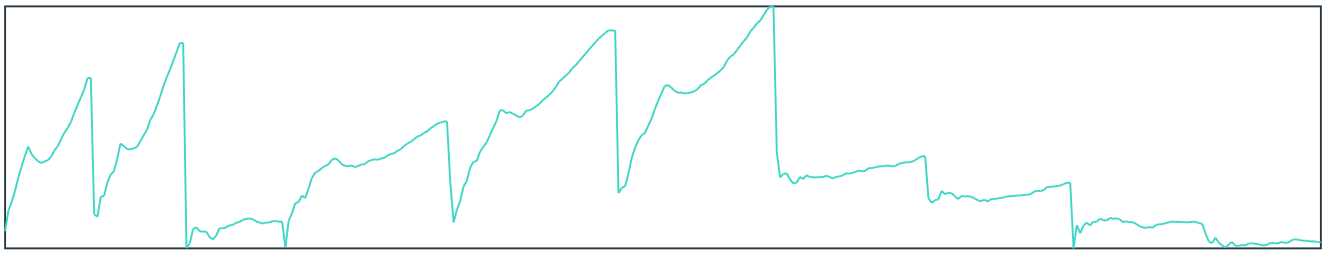


## Live pulse (Score)



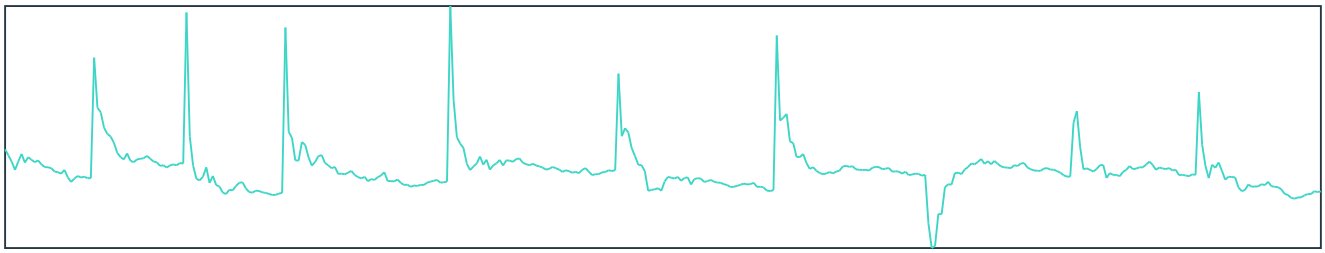
n=400 min=0.00 max=3.21

## Live pulse (SoftAcc)



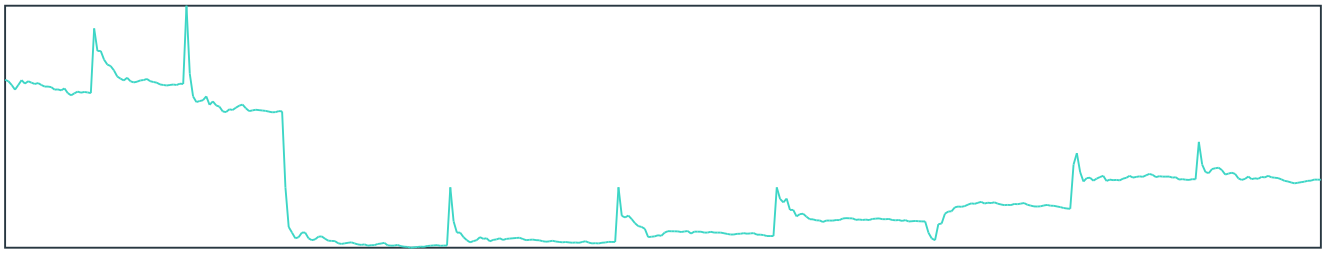
n=400 min=1.54 max=1.54

## Live pulse (Availability)



n=400 min=20.06 max=27.75

## Live pulse (Throughput)



n=400 min=133.33 max=303.83

## 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 |