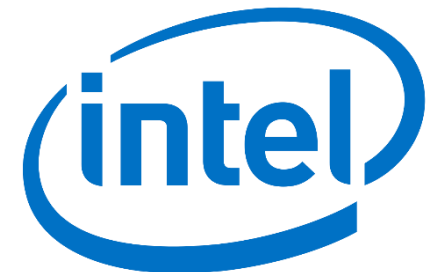


3rd Data Prefetching Championship

June 23rd, 2019

Held in conjunction with ISCA 2019

Seth Pugsley (Intel Labs)

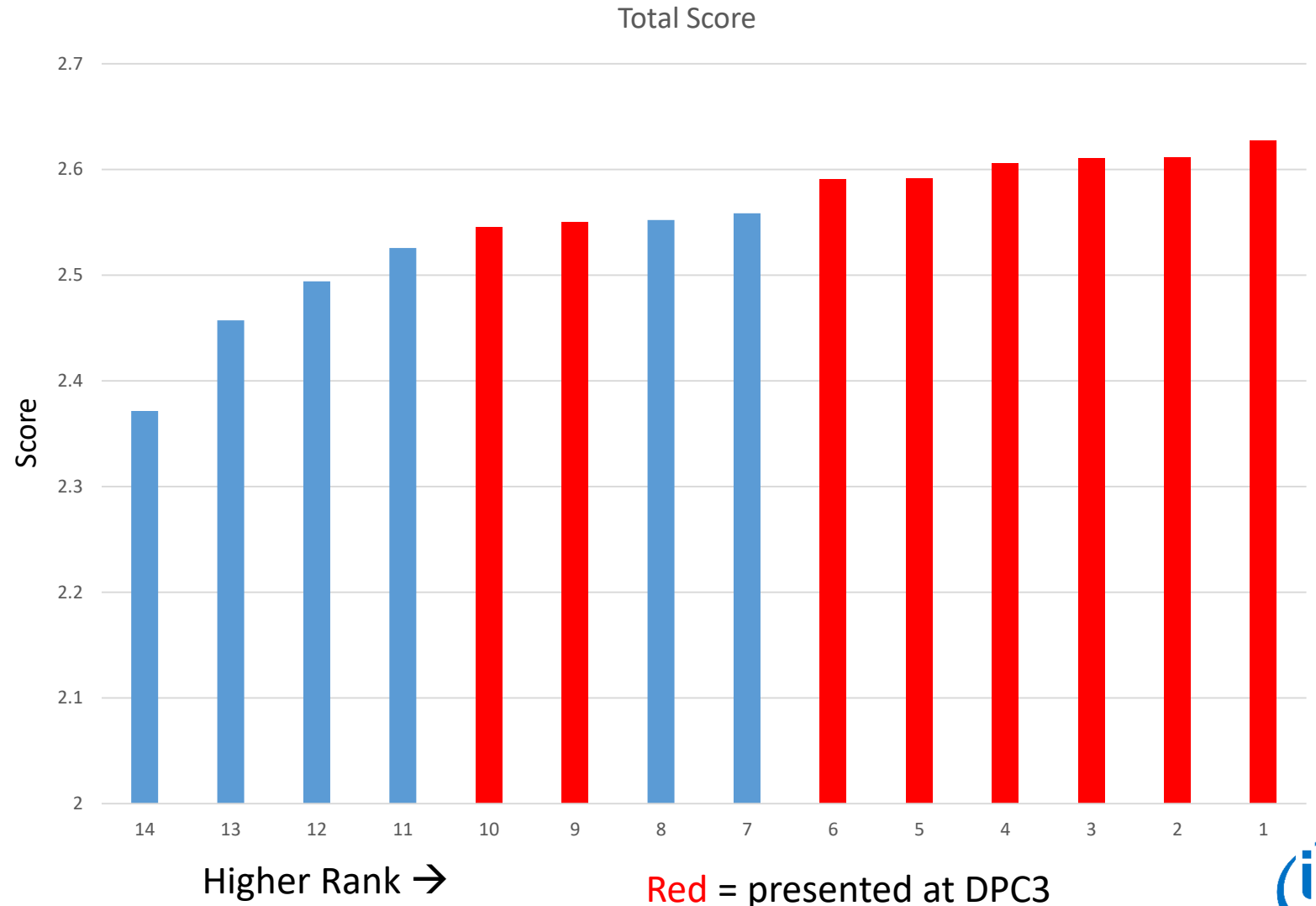


Closing and Results

- Thank you for your hard work
- 14 submissions
 - Top 6 performing prefetchers presented
- Final Score
 - (Geomean of all single core speedups) + (Geomean of all 4 core speedups)
- Prize for the overall winner

Overall Score

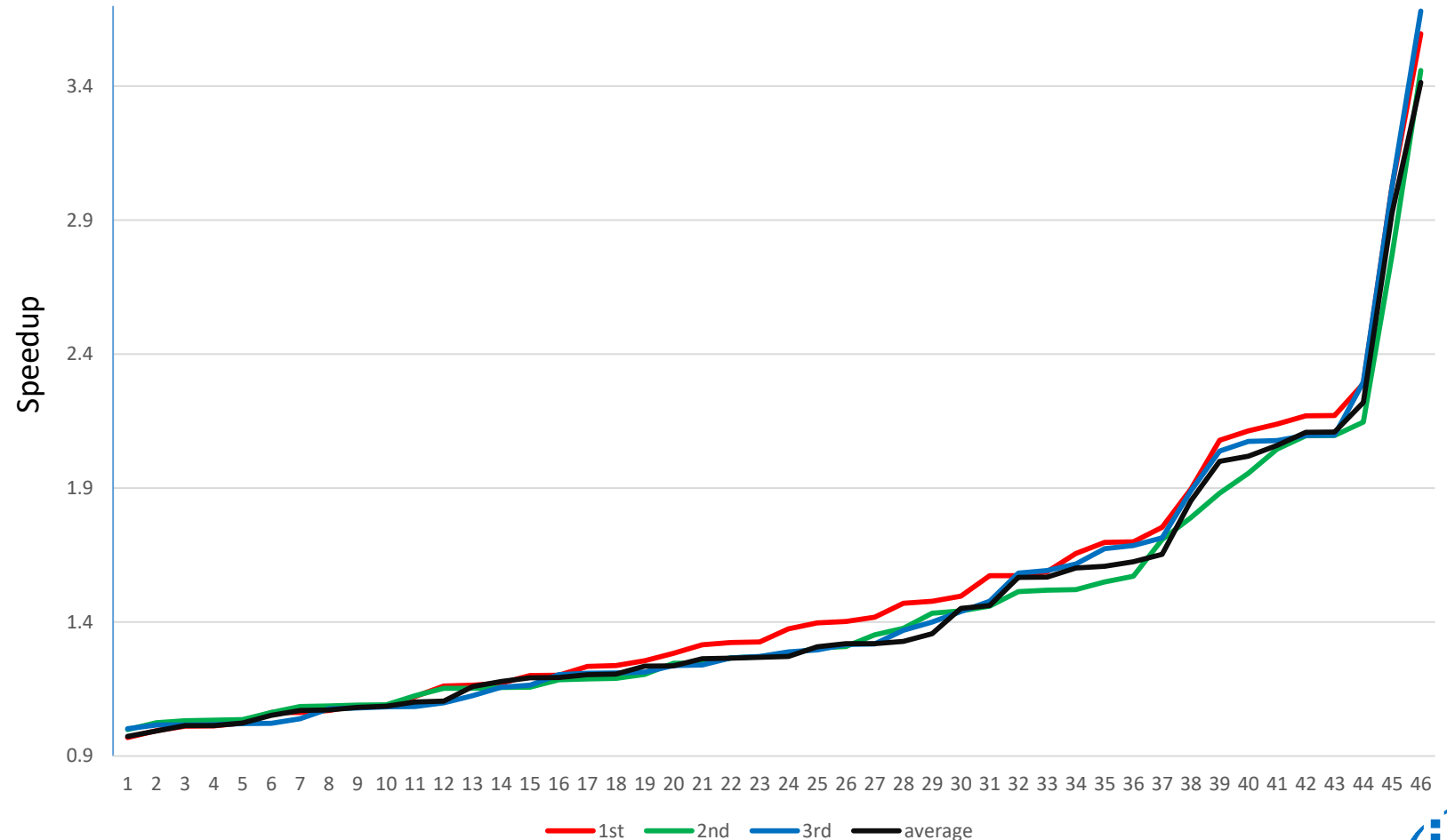
- Most submitted prefetchers very competitive
- Top of the field looks crowded
 - +0.6% between 1st and 2nd
 - +1.4% between 1st and 6th
- Strengths vary between single- and multi-core



Single-Core Speedup S-Curves

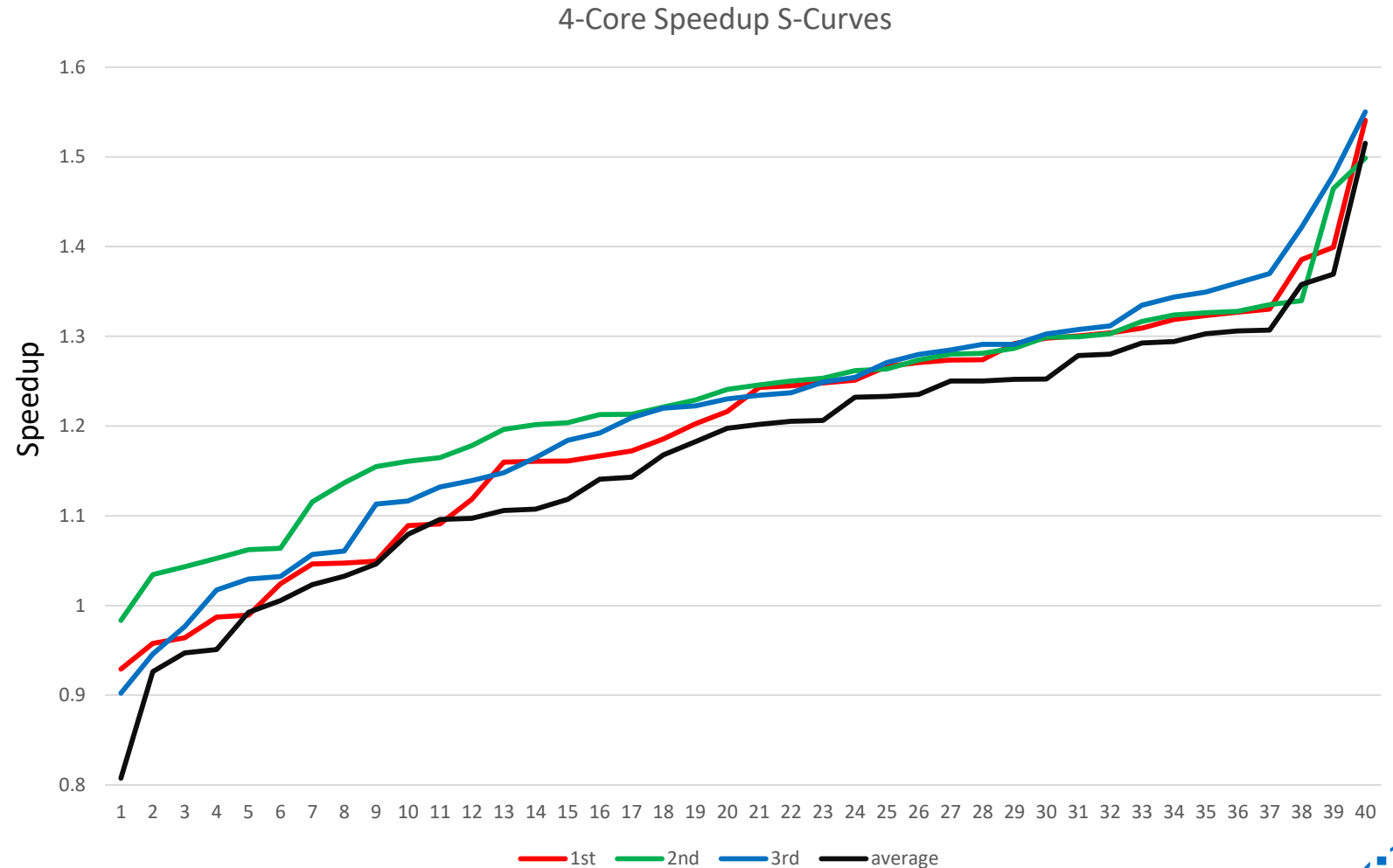
- 1st place prefetcher shows large benefits compared to 2nd and 3rd place
- 2nd place behind 3rd place for single core
- 2nd place also behind average
 - 11th place single-core
- 1st place 1.3% ahead of second best single-core prefetcher (not shown)

1-Core Speedup S-Curves



4-core Speedup S-Curves

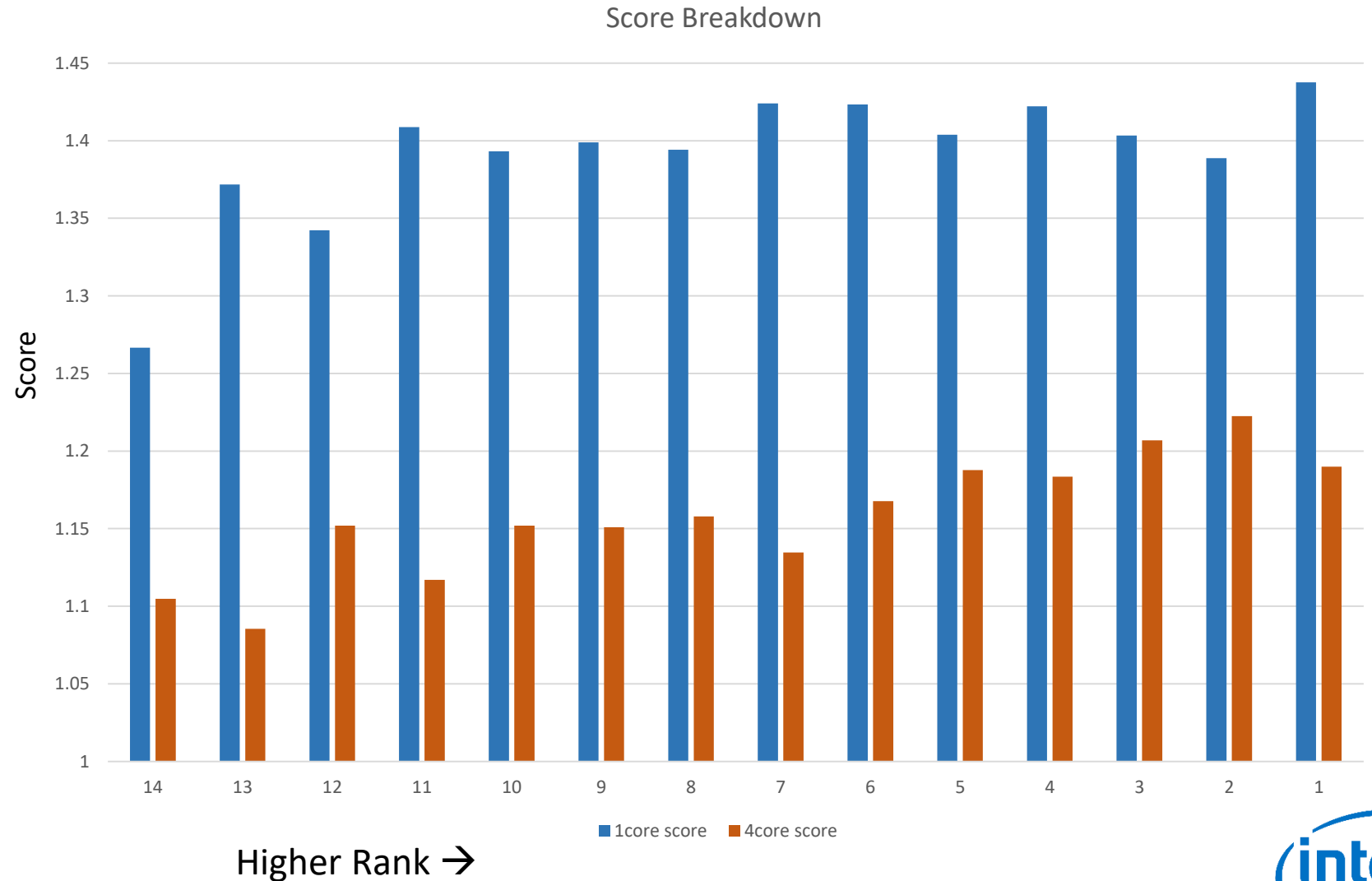
- 2nd place prefetcher wins 4-core configuration due to greatly improved worst case
- 2nd place 1.5% ahead of second best 4-core prefetcher (3rd)
- Top 3 4-core prefetchers also top 3 overall



Workloads sorted by increasing speedup per prefetcher

Score Breakdowns

- 1st place has 1st best single-core and 3rd best 4-core perf.
- 2nd place has 11th best single-core and 1st best 4-core perf.
- 3rd place has 7th best single-core and 2nd best 4-core perf.
- Strong 4-core performance made the difference



Top 3 prefetchers ...

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 - by Mehran Shakerinava, Mohammad Bakhshalipour, Pejman Lotfi-Kamran, Hamid Sarbazi-Azad

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- 2nd place: “Accurately and Maximally Prefetching Spatial Data Access Patterns with Bingo”
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Top 3 prefetchers ...

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- 2nd place: “Accurately and Maximally Prefetching Spatial Data Access Patterns with Bingo”
 - by Mohammad Bakhshalipour, Mehran Shakerinava, Pejman Lotfi-Kamran, Hamid Sarbazi-Azad
- 1st place: “Bouquet of Instruction Pointers: Instruction Pointer Classifier-based Hardware Prefetching”
 - by Samuel Pakalapati, Biswabandan Panda

Thank You!

- Congratulations to the winners!