“Disruptive” Applications of GPGPU Technology

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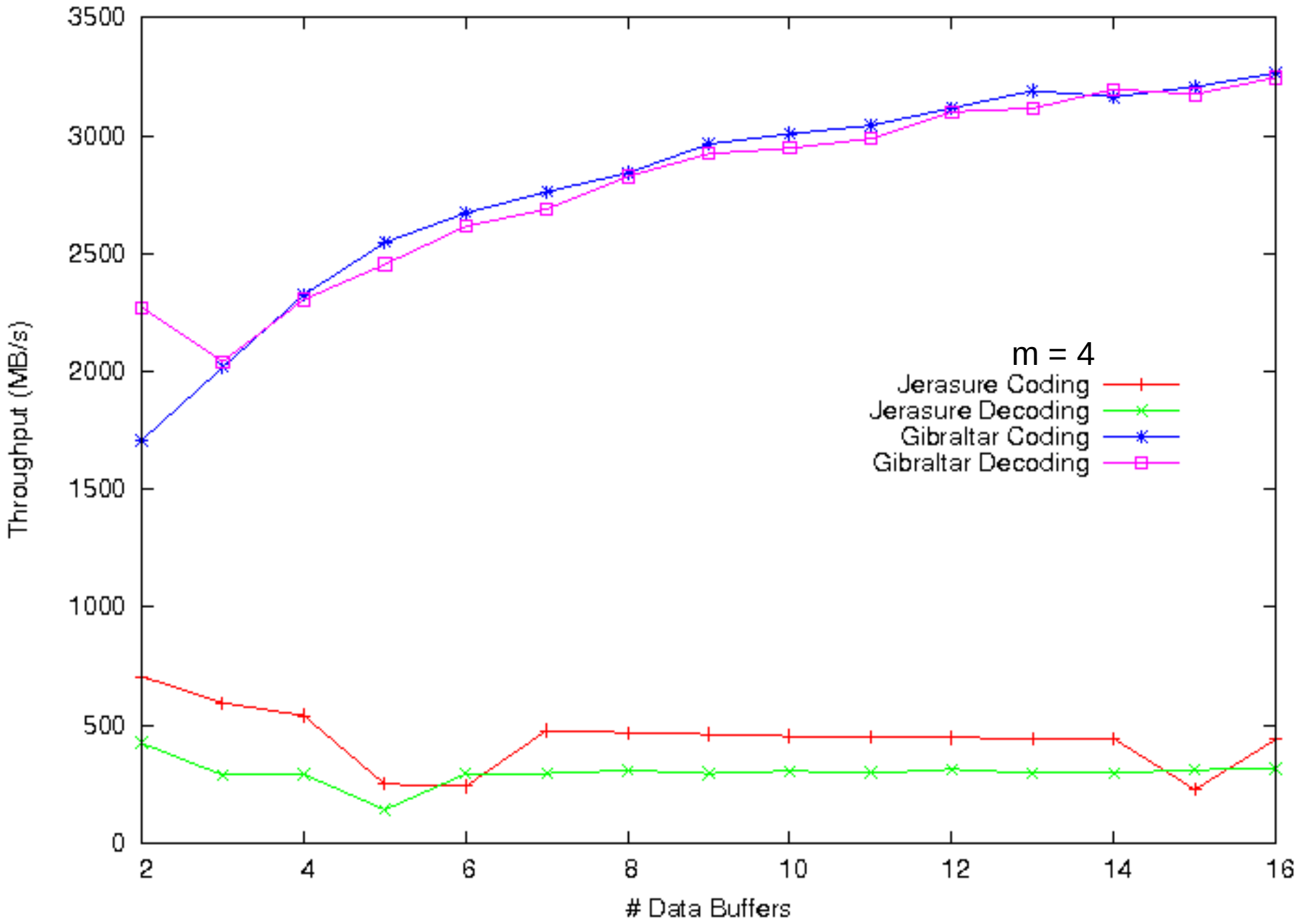
GPGPUs as a Disruptive Technology

- Disruptive: A technology capable of creating a new area of development
- Arguably, GPGPUs are already disruptive
  - Deskside “supercomputers”
  - Wide-scale cycle sharing (protein folding)
  - Game-based physics
- GPUs still haven’t broken into large HPC installations (production supercomputers.) Why not, and why should they?

Non-Traditional GPGPU Applications

- Reed-Solomon coding
  - No floating-point arithmetic
  - Application of abstract algebra
- Huffman coding
  - Heavy branching behavior
  - Complex, variable-length output and data structures
- Despite being non-ideal, GPUs can accelerate these workloads by up to ten-fold.


3500
3000
2500
2000
1500
1000
500
0
Throughput (MB/s)
2
4
6
8
10
12
14
16
# Data Buffers
m = 4
Jerasure Coding
Jerasure Decoding
Gibraltar Coding
Gibraltar Decoding