COMPSCI 589
Lecture 13: Introduction to Apache Spark

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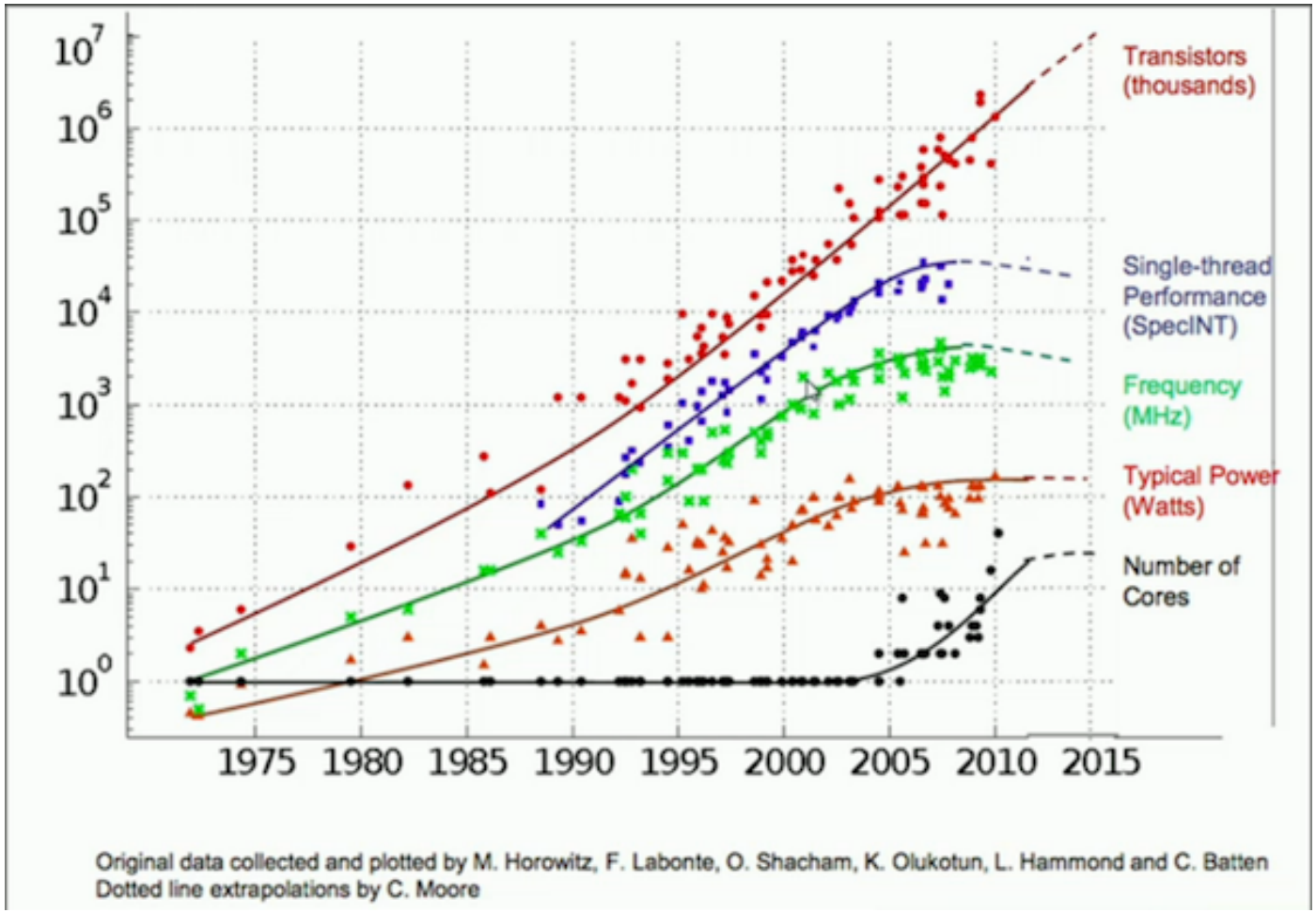
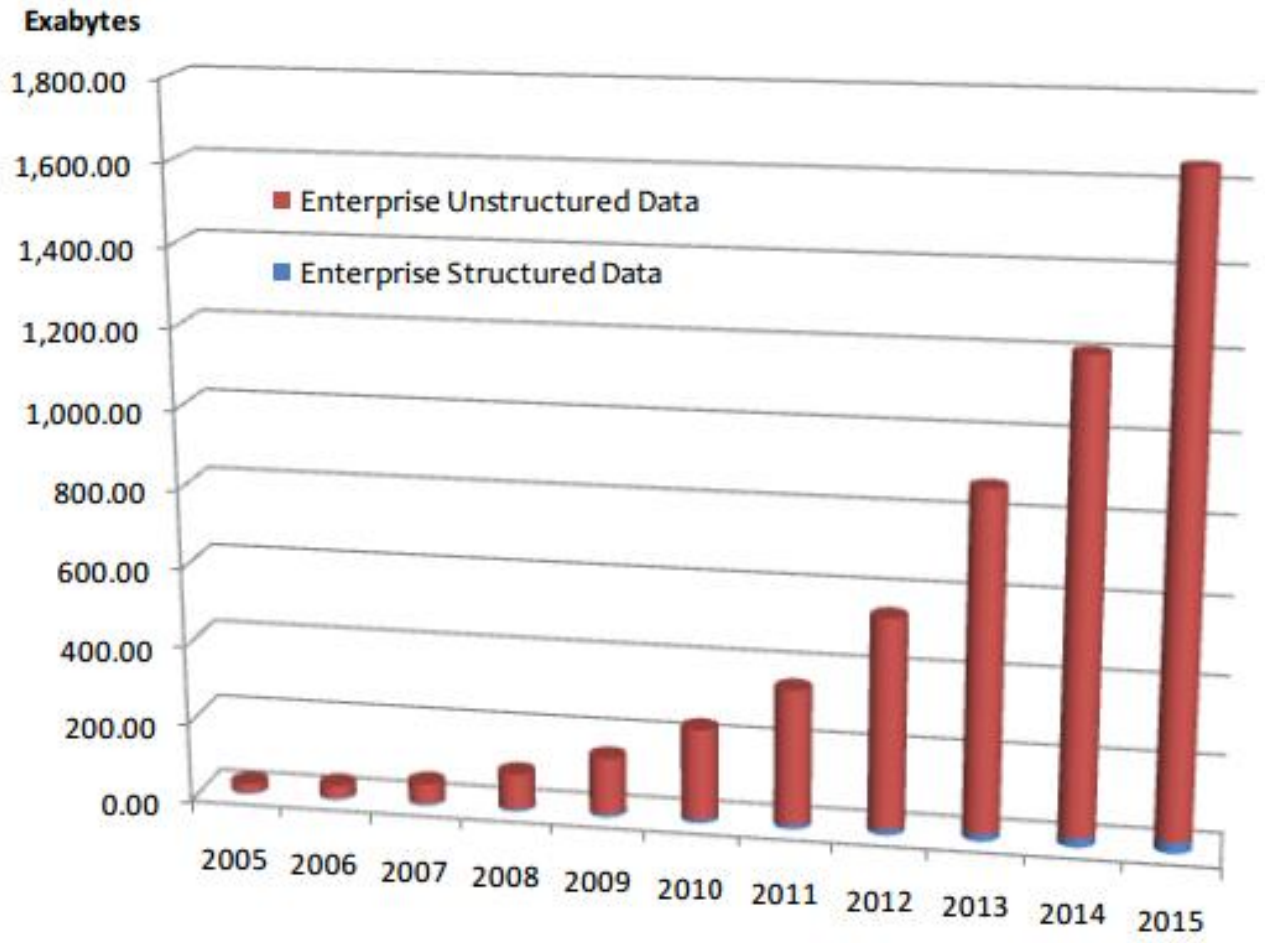
Outline

Moore's Law



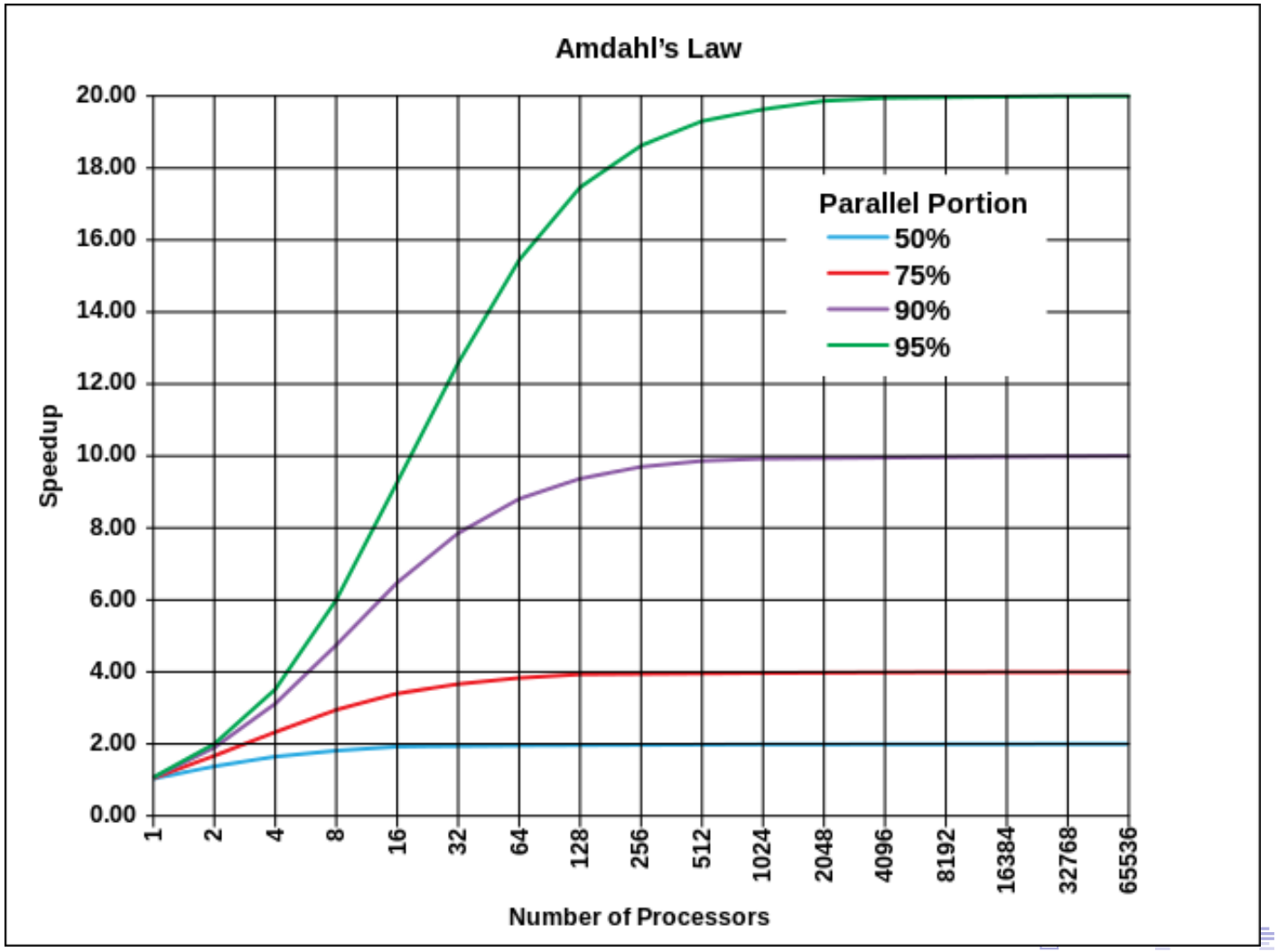
Machine Learning's free ride ended in about 2005.

Big Data



The amount of data is doubling every two years.

Amdahl's Law


Amdahl's Law
Speedup
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Parallel Portion
50%
75%
90%
95%
1
2
4
8
16
32
64
128
256
512
1024
2048
4096
8192
16384
32768
65536
Number of Processors

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  - Apply a Boolean filter to select only certain data elements (Filter)
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- It turns out that a small number of such easily parallelizable functional programming primitives are sufficient for creating data-parallel implementations of machine learning algorithms.

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- MapReduce uses a specialization of reduce for key-value pairs called *reduce-by-key*.

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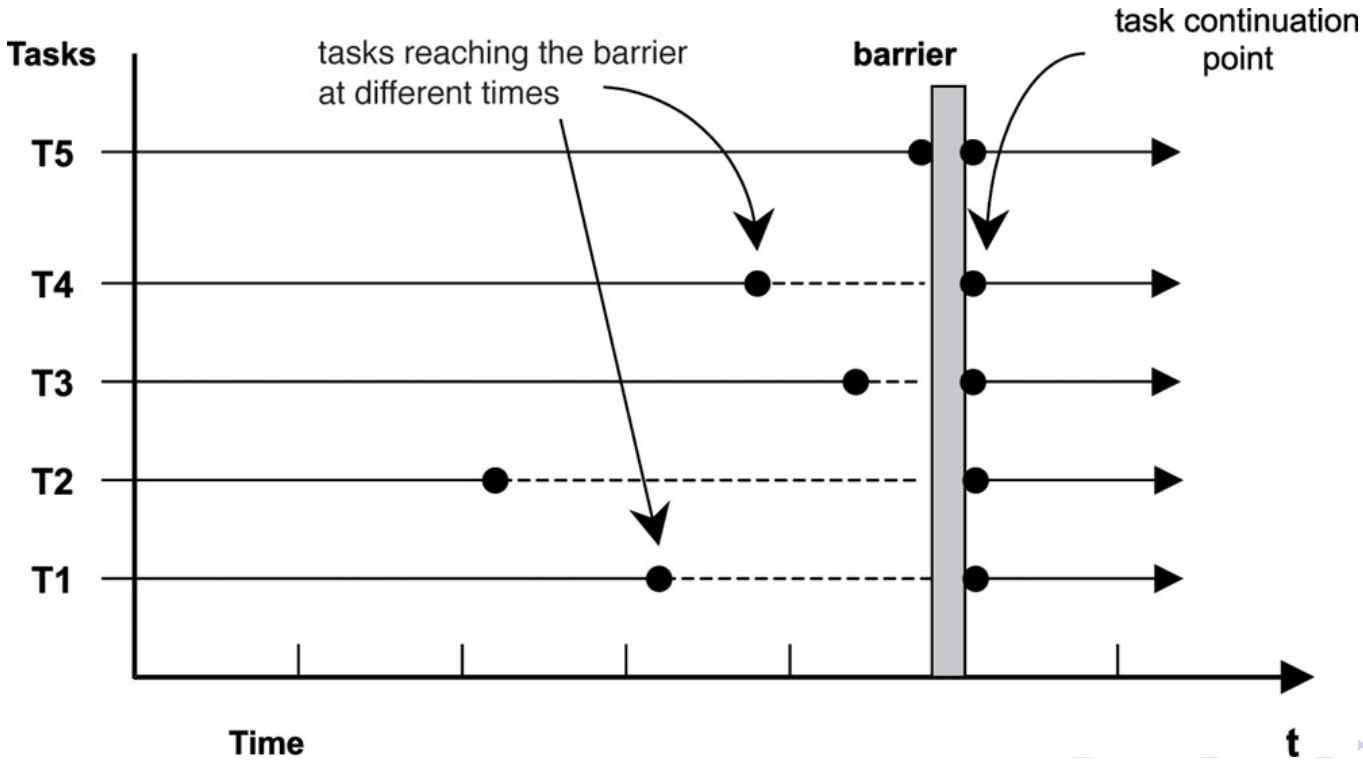

Apache Spark

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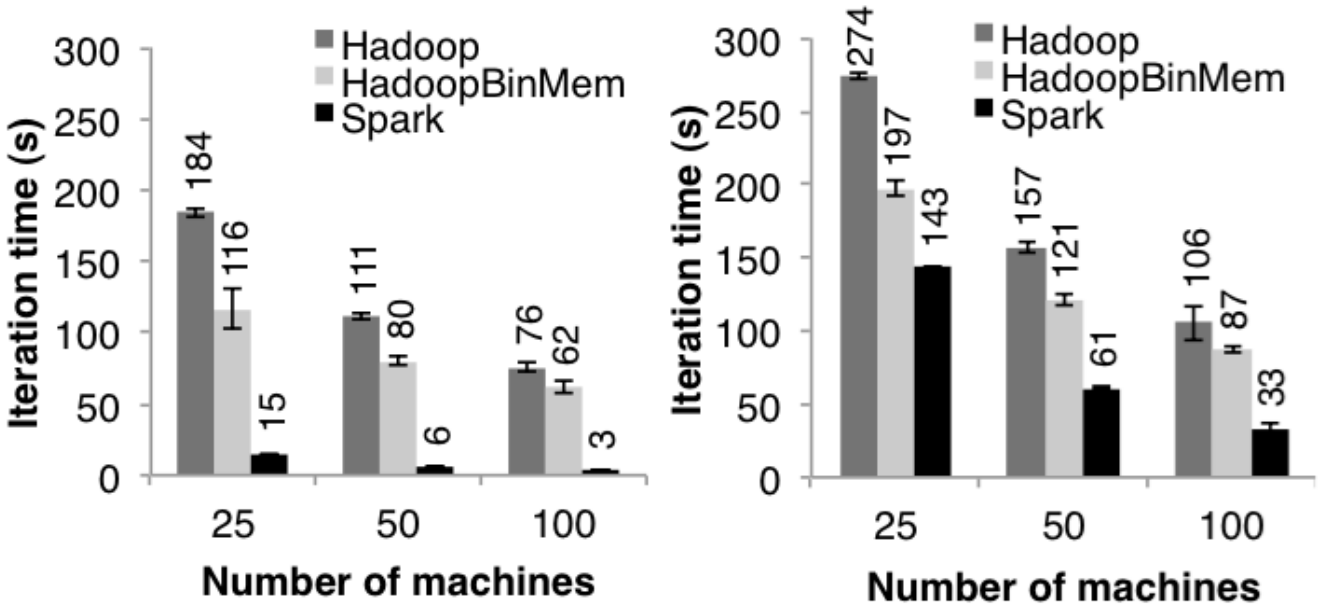

Apache Spark

Examples