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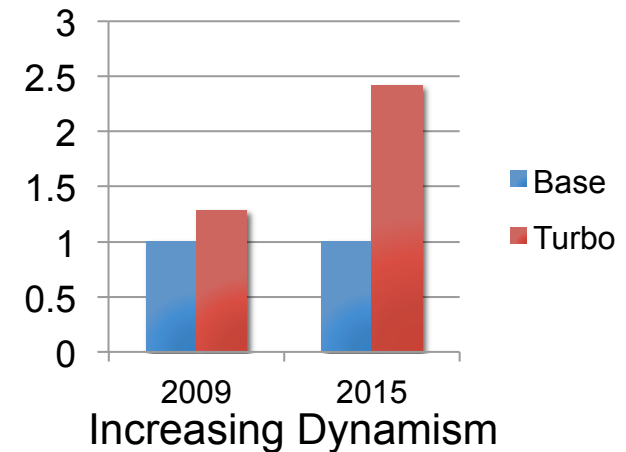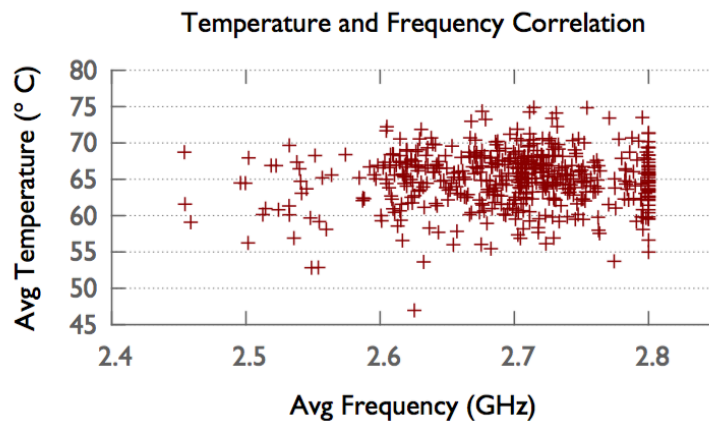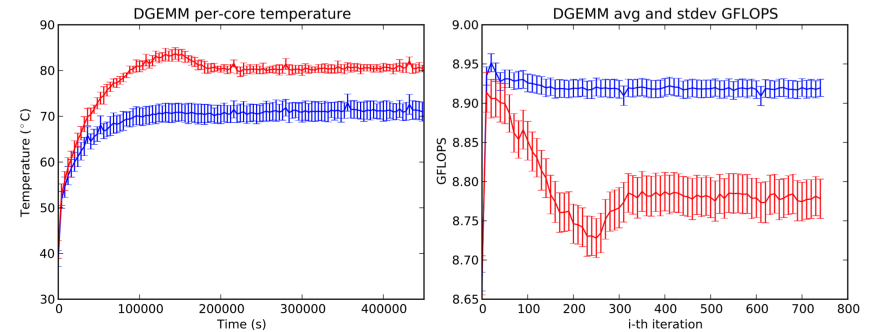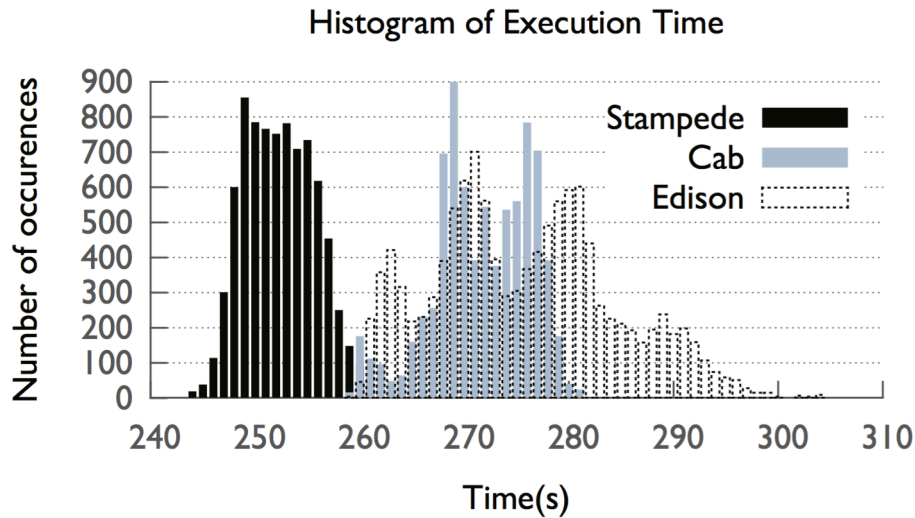Senior Fellow, University of Chicago Computation Institute

Homework Problem

Parallel Computer: Nodes: 128
Data: 1M (1048576) values

What is a good algorithm for adding the values efficiently?

Dynamic Node Performance is Increasing

- To improve performance under power constraints, chips use dynamic overclocking
- Chips have *increasing* silicon process variability impacting power constraints

Histogram of Execution Time

DGEMM per-core temperature

DGEMM avg and stdev GFLOPS

Temperature and Frequency Correlation

Increasing Dynamism

Courtesty Bilge Acun

New Programming Model:

Equal Work ≠ Equal Time

Dynamic Runtime