Multicore and Empirical Research

Walter F. Tichy
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AMD Opteron 12 cores
~1.8 Bill. T. on 2x3.46cm²

Sun Niagara3 16 cores
~1 Bill. T. on 3.7cm²

Intel SCC
48 cores
~1.3 Bill. T. on 5.6 cm²

Intel
2 cores
~167 Mio. T. on 1.1cm²

Intel
8 cores
~2.3 Bill. T. on 6.8cm²

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16 cores
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Intel
4 cores
~582 Mio. T. on 2.86cm²

Victor Pankratius
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Software?
Research Topics

- Multicore is ripe for method/tool development
- With Empirical evaluation in the loop
  - Re-engineering sequential applications (real ones)
  - Case studies on how parallelization works
  - Tools to clean up sequential programs for parallelization
  - Autotuning
  - New language constructs (with empirical eval.)
  - Memory models
  - Parallel testing and testing in parallel
  - Finding synchronization bugs and race conditions
- Don’t even know the right questions to ask