The Impact of Programming Difficulty on Hardware Obsolescence
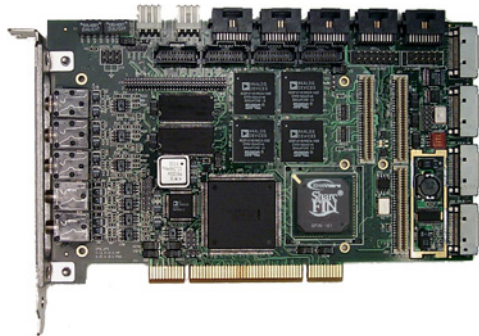
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New Hardware Offers More Operations in Less Area

1990s: SHARC DSP Boards

Now: Multicore and FPGA

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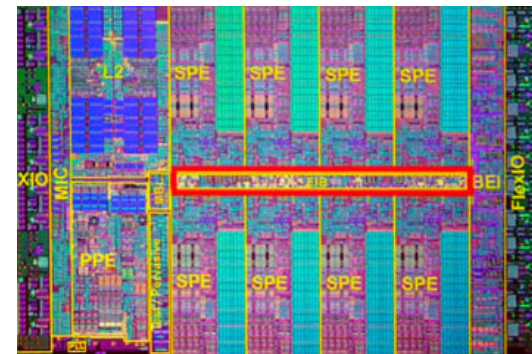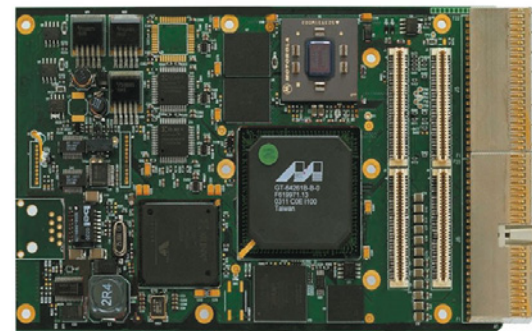
Programming Difficulty Still Swept Under the Rug

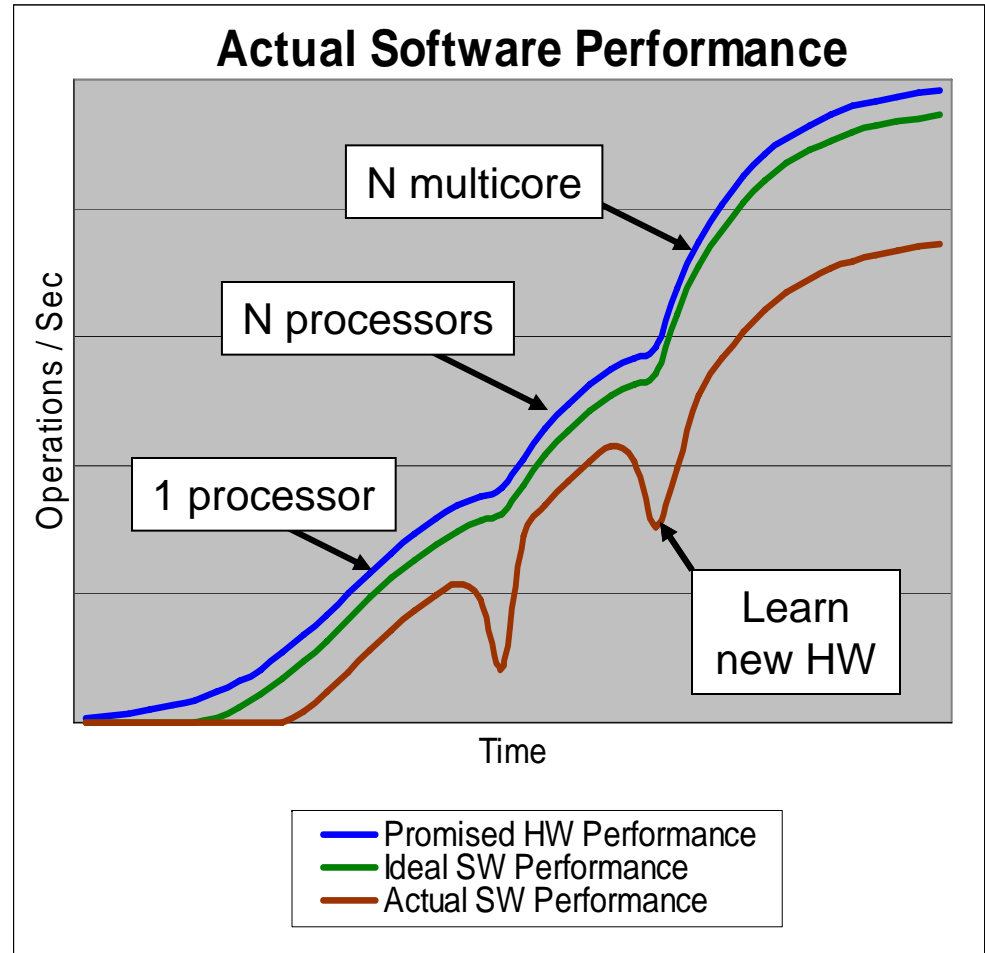| 1990s: SHARC DSP Boards	Now: Multicore and FPGA
• Middleware hides DSP complexities but does not tap its full power • Difficult to program DSP at a low level • Long schedules • High costs • Difficult to maintain	Are We Repeating the Same Problems?

Programming Difficulty Affects Performance

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- Each new HW technology requires relearning how to program and recoding of algorithms

- Will the promise of new hardware be fully realized if software development lags behind?

Actual Software Performance

N multicore

N processors

1 processor

Learn new HW

Operations / Sec

Time

— Promised HW Performance
— Ideal SW Performance
— Actual SW Performance

Gedae: A Model Driven Solution to SW Development

- Specification of entire application
  - From high level (mode control) to low level (vector ops)
  - From data input (A-to-D) to display (GUIs)

- Highly portable language
  - Functionality developed separately from target-specific implementation

- Quality autocoding
  - Outputs real time applications

- Implements the complete software product
  - Multiprocessor, heterogeneous

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