HPEC 2006: Looking Forward, Looking Back…

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
Programming Difficulty Still Swept Under the Rug

1990s: SHARC DSP Boards
- 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

Now: Multicore and FPGA

Are We Repeating the Same Problems?
Programming Difficulty Affects Performance

- 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?
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