
Execution and Programming Models: Extreme-Scale and Beyond DFM '19 Panel

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Q1: Program Execution Model (PXM) vs. Programming Model (PM)

- Programming Model = high level concepts
- Program Execution Model = what allows these concept to be implemented
- A good system must intimately match the two; otherwise heavy compiler intervention will be required
- Example 1: Fortran (PM) and von Neumann model (PXM)
- Example 2: SISAL (PM) and data-flow execution (PXM)
- → We need to find the appropriate pair for future high-performance, large-scale parallel, heterogeneous systems

Q2: System-level API and Fine-Grain Parallelism

- Heterogeneous systems pose a new challenge
- Need to integrate multiple metrics:
 - Performance is still first
 - Power and energy could be major issues in many environments

Q3: Programmability of dataflow models

- Data-flow *vs.* control-flow debate
- Both are needed
- Finding the right balance (may be at multiple levels) is the problem