Computational Research in Boston and Beyond Seminar

Setting a Course for Post-Moore Software Performance

Friday, December 5, 2025

12:00 PM - 1:00 PM

Zoom: https://mit.zoom.us/j/91933017072

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Abstract

Software performance engineering (SPE) is the science and art of making code run fast or otherwise limiting its consumption of resources, such as power, memory footprint, network utilization, file IO's, response time, etc. SPE encompasses parallel computing, but it also includes other techniques, such as caching, vectorization, algorithms, bit tricks, loop unrolling, compiler-switch selection, tailoring code to the architecture, exploiting sparsity, changing data representation, metaprogramming, etc. Historically, gains in performance from miniaturization, codified in Moore's Law, relieved programmers from the burden of making software run fast and learning SPE techniques. I will explain why the end of Moore's Law has made SPE a critical technical skill. Since SPE is neither extensively researched nor widely taught in the universities, however, it risks devolving into an unstructured collection of ad hoc tricks. Now is the time to establish SPE as a science-based discipline, alongside traditional areas of computer science.