Challenges in Combinatorial Scientific Computing

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Abstract:
Computation on large combinatorial structures -- graphs, strings, partial orders, etc. -- has become fundamental in many areas of data analysis and scientific modeling. The field of high-performance combinatorial computing, however, is in its infancy. By way of contrast, in numerical supercomputing we possess standard algorithmic primitives, high-performance software libraries, powerful rapid-prototyping tools, and a deep understanding of effective mappings of problems to high-performance computer architectures.

This talk will describe several challenges for the field of combinatorial scientific computing in algorithms, tools, architectures, and mathematics. I will draw examples from several applications, and I will highlight our group's work on high-performance implementation of algebraic primitives for computation on large graphs.

Monday December 8th 2008
4:30 PM
Building 4, Room 231

Refreshments at 4:00 PM in Building 2, Room 349
(Applied Math Common Room)