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## Special Guest Lectures

**The Principle of Computational Least Action****Robert W. Numrich, Minnesota Supercomputing Institute**

University of Minnesota, Minneapolis

Johnston Hall 331

January 17, 2007 - 01:30 pm

**Abstract:**

We define a normed metric space for computer programs and derive from it the Principle of Computational Least Action. A program follows a trajectory determined by Newton's equation of motion in an abstract computational space and generates computational action as it evolves in phase space. A program's size is the L1-norm of its action function, and its distance from other programs is the distance derived from the action norm. The Principle of Computational Least Action states the goal of performance optimization as finding the program with the smallest size. We illustrate this principle by analyzing a simple program.

**Speaker's Bio:**

Bob Numrich is a Senior Research Associate at the Minnesota Supercomputing Institute, University of Minnesota, Minneapolis. His research interests include parallel architectures, parallel programming languages, and parallel numerical algorithms. He also studies computer performance analysis and the development of theoretical models that yield self-similarity relationships between systems. Previous to his position at the University of Minnesota, he was Principal Scientist at Cray Research where he worked on the Cray-2 and Cray-3 architectures and was a member of the core development teams for the Cray-T3D and Cray-T3E. He invented the one-sided parallel programming model that became the SHMEM Library, and he is the principal author of the Co-Array Fortran programming model.

**Refreshments will be served.****This lecture has a reception.**