Extremescale Algorithms/Scalable algorithms

Developing advanced stochastic and hybrid scalable algorithms for Linear Algebra, Optimization for data and compute intensive problems enabling algorithmic level scalability of the stack.

Summary

Extreme Computing group focus here is on designing scalable algorithms, such as advanced stochastic and hybrid methods and algorithms for Linear Algebra, Optimization, Simulation etc applied to variety of practical Data and Compute intensive problems. This research effort is focused to enable scalability at the algorithmic level of the stack. (Photo: Millennium Simulation)

Objectives

- To develop Monte Carlo, quasi-Monte Carlo and hybrid stochastic/deterministic scalable algorithms for Linear Algebra.
- To develop Monte Carlo, quasi-Monte Carlo and hybrid stochastic/deterministic scalable algorithms for optimization problems.
- To develop advanced scalable algorithms for solving problems with uncertainties such as sensitivity analysis, etc for problems in the area of Environmental Modelling, Social Media, etc.
- To develop advanced scalable algorithms for discovering global properties on data based on Network Science and optimization methods for data and compute intensive problems.
- To develop scalable Monte Carlo and hybrid Monte Carlo algorithms for crowd simulation.

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