

G-CSC Kolloquium

Optimal Algorithms Using Optimal Meshes

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Abstract

We discuss two problems involving adaptive meshes. The first relates to non-nested multigrid in two and three dimensions. We review what is known theoretically and describe some recent work related to optimal implementation. The second involves meshes in arbitrary dimensions. We show that there are meshes in which the number of nodes grows linearly in the dimension, and give some evidence via a quantum mechanics example that an h-P strategy can be effective to obtain good convergence behavior on these meshes. If time permits, we will describe some on-going work developing new formulations for nonlinear and nonlocal dielectric models for proteins.