Title: Parallel Distance 2 Graph Coloring for Algebraic Multigrid Preconditioners

Algebraic multigrid (AMG) methods are used extensively as preconditioners and solvers for problems in thermal fluids and electromagnetics. AMG operates by creating a sequence of increasingly coarse matrices in order to accelerate the solution of a fine resolution linear system. The coarsening phase in the Trilinos multigrid library (MueLu) uses a graph that encodes the structure of the matrix to construct node aggregates, each of which contains a root node and its neighbors. A distance-2 graph coloring can be used to generate these aggregates by selecting the nodes sharing the same color as the root nodes. This allows the aggregates to be formed in parallel as the distance-2 coloring guarantees that no aggregates can overlap. We present a new thread-parallel distance-2 coloring heuristic and show how it is used in the coarsening operation within MueLu.