Abstract

We develop a fast and high quality multilevel algorithm that directly partitions hypergraphs into k balanced blocks – without the detour over recursive bipartitioning. In particular, our algorithm efficiently implements the powerful FM local search heuristics for the complicated k-way case. This is important for objective functions which depend on the number of blocks connected by a hyperedge. We also remove several further bottlenecks in processing large hyperedges, develop a faster contraction algorithm, and a new adaptive stopping rule for local search. To further reduce the size of hyperedges, we develop a *pin-sparsifier* based on the min-hashing technique that clusters vertices with similar neighborhood. Extensive experiments indicate that our KaHyPar-partitioner compares favorably with the best previous systems. KaHyPar is faster than hMetis *and* computes better solutions. KaHyPar's results are considerably better than the (faster) PaToH partitioner.