

Graph Partitioning for Nested Dissection: A Historical Perspective

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Alan George's seminal paper on nested dissection reduced the problem of finding low-fill orderings to one of finding good vertex separators in graphs. At first glance, this may not seem like much progress since it exchanges one NP-hard problem for another. But for many important classes of graphs, good separators are known to exist and efficient algorithms can find them. Nested dissection led to important new ideas in separator heuristics. And the sparse linear algebra community has been able to benefit from graph partitioning insights coming from unrelated research areas - particularly circuit placement and parallel computing. This talk will survey this rich history of algorithmic innovation and discuss directions for future research.