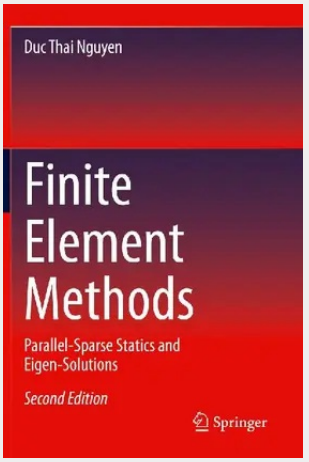
Nguyen

Finite Element Methods

Parallel-Sparse Statics and Eigen-Solutions



This new edition includes three new chapters, 7 through 9, that have very broad, practical applications in engineering and science. In addition, the author's latest research results incorporated into the new textbook demonstrates better performance than the popular METIS software for partitioning graphs, partitioning finite element meshes, and producing fill-reducing orderings for sparse matrices. The new Chapter 8, and its pre-requisite, Chapter 7, present a state-of-the-art algorithm for computing the shortest paths for real-life (large-scale) transportation networks with minimum computational time. This approach has not yet appeared in any existing textbooks and it could open the doors for other transportation engineering applications. Chapter 9 vastly expands the scope of the previous edition by including sensitivity (gradient) computation and MATLAB's built-in function "fmincon" for obtaining the optimum (or best) solution for general engineering problems.

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