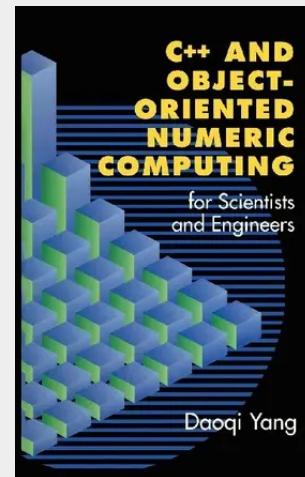


C++ and Object-Oriented Numeric Computing for Scientists and Engineers

This book is intended to be an easy, concise, but rather complete, introduction to the ISO/ANSI C++ programming language with special emphasis on object-oriented numeric computation for students and professionals in science and engineering. The description of the language is platform independent. Thus it applies to different operating systems such as UNIX, Linux, MacOS, Windows, and DOS, as long as a standard C++ compiler is equipped. The prerequisite of this book is elementary knowledge of calculus and linear algebra. However, this prerequisite is hardly necessary if this book is going to be used as a textbook for teaching C++ and all the sections on numeric methods are skipped. Programming experience in another language such as FORTRAN, C, Ada, Pascal, Maple, or Matlab will certainly help, but is not presumed. All C++ features are introduced in an easy way through concepts such as functions, complex numbers, vectors, matrices, and integrals, which are familiar to every student and professional in science and engineering. In the final chapter, advanced features that are not found in FORTRAN, C, Ada, or Matlab, are illustrated in the context of iterative algorithms for linear systems such as the preconditioned conjugate gradient (CG) method and generalized minimum residual (GMRES) method. Knowledge of CG, GMRES, and preconditioning techniques is not presumed and they are explained in detail at the algorithmic level.

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