



# Fundamentals of Matrix Computations

*David S. Watkins*

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**Fundamentals of Matrix Computations** David S. Watkins

**This new, modernized edition provides a clear and thorough introduction to matrix computations, a key component of scientific computing**

Retaining the accessible and hands-on style of its predecessor, *Fundamentals of Matrix Computations*, Third Edition thoroughly details matrix computations and the accompanying theory alongside the author's useful insights. The book presents the most important algorithms of numerical linear algebra and helps readers to understand how the algorithms are developed and why they work.

Along with new and updated examples, the *Third Edition* features:

- A novel approach to Francis' QR algorithm that explains its properties without reference to the basic QR algorithm
- Application of classical Gram-Schmidt with reorthogonalization
- A revised approach to the derivation of the Golub-Reinsch SVD algorithm
- New coverage on solving product eigenvalue problems
- Expanded treatment of the Jacobi-Davidson method
- A new discussion on stopping criteria for iterative methods for solving linear equations

Throughout the book, numerous new and updated exercises—ranging from routine computations and verifications to challenging programming and proofs—are provided, allowing readers to immediately engage in applying the presented concepts. The new edition also incorporates MATLAB to solve real-world problems in electrical circuits, mass-spring systems, and simple partial differential equations, and an index of MATLAB terms assists readers with understanding the basic concepts related to the software.

*Fundamentals of Matrix Computations*, Third Edition is an excellent book for courses on matrix computations and applied numerical linear algebra at the upper-undergraduate and graduate level. The book is also a valuable resource for researchers and practitioners working in the fields of engineering and computer science who need to know how to solve problems involving matrix computations.

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