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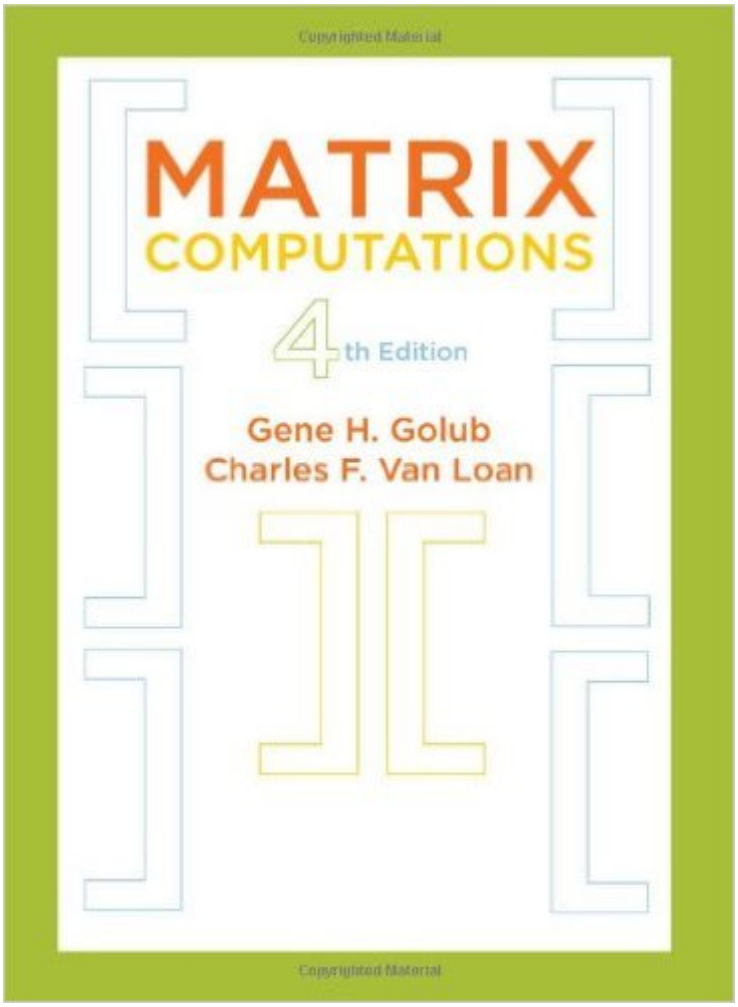
Matrix Computations (Johns Hopkins Studies In The Mathematical Sciences)



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Synopsis

The fourth edition of Gene H. Golub and Charles F. Van Loan’s classic is an essential reference for computational scientists and engineers in addition to researchers in the numerical linear algebra community. Anyone whose work requires the solution to a matrix problem and an appreciation of its mathematical properties will find this book to be an indispensible tool. This revision is a cover-to-cover expansion and renovation of the third edition. It now includes an introduction to tensor computations and brand new sections on â ¢ fast transformsâ ¢ parallel LUâ ¢ discrete Poisson solversâ ¢ pseudospectraâ ¢ structured linear equation problemsâ ¢ structured eigenvalue problemsâ ¢ large-scale SVD methodsâ ¢ polynomial eigenvalue problems Matrix Computations is packed with challenging problems, insightful derivations, and pointers to the literatureâ •everything needed to become a matrix-savvy developer of numerical methods and software.

Book Information

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Customer Reviews

Golub/Van Loan is not written in a very compelling style (very formal), but it is a great reference to understand how and why numerical matrix computation work. I’ve used it extensively for developing my own Singular Value Decomposition (SVD) routine, as well as routines for general eigenvalue problems. It’s not great to use as a textbook for novices, but it is essential for use as a reference and as a teaching tool when doing anything related to numerical matrix computations. A good companion to this book is Trefethen/Bau ’Numerical Linear Algebra’.

This is now the best and most up-to-date textbook for numerical linear algebra at the graduate level, which I have been teaching for seven years. In the past, I always liked its third edition as a reference book, but hesitated to use it as a textbook, because it was difficult for students to study. The fourth edition reads much clearer, and I also like the new organization of the chapters very much. The fourth edition is much more friendly for self-study by matured students. I highly recommend it to students and practitioners who already have some basic understanding of linear algebra and would like to learn more about numerical algorithms in linear algebra for computational sciences.A word of caution: This book is not meant to be an introduction to linear algebra for self-study or at the undergraduate level. There are good books specifically for that purpose, such as Linear Algebra and Its Applications by Gilbert Strang.

This book is a true gem. It contains a huge amount of useful and up to date (2012) content from leading publications related to matrix computations. This book is a must for a researcher or an algorithm developer dealing with scientific computing. Not only it is highly detailed and can be used as a "cookbook" for algorithms, but *mostly* because it discusses theoretical aspects from both pure mathematical points of view and applied point of view (computational cost, accuracy, floating points, condition number, etc.) and brings useful insights that help the reader to understand what he really needs.

The classical book on matrix analysis. 4-th edition includes all the classical stuff and a lot of new topics; the illustrations are now provided as snipplets of MATLAB code. Must have for all people working in linear algebra, matrix and numerical analysis.

The book has errors. I do not mean typos, but errors in programs and algorithms. I used two previous editions and order the newest hoping that it would be more error-free. What is disappointing, this book is a great source of reference and some codes and methods are really hard to find anywhere else, and are never explained as systematically. The style is not the easiest to digest, but once you passed enough numerical analysis classes, you mostly need a reference, and how attractive is this: everything in one book? I appreciate switching from fortran to matlab.

This is an amazing resource for understanding the numerical problems associated with implementations of matrix algorithms. I use it regularly for writing source code for solving problems that require the concepts discussed in the book.

Amazing book. You can find absolutely anything you want in it.But heads-up: it’s not a good book if you don’t know anything about what you are going to read. It should be a "support", but not the first book you read in this field.

It is exactly what it says on the cover. A great piece of work. I have owned the 2nd & 3rd editions too, and this is a very helpful extension of the previous works.

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