Book Reviews

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BOOK REVIEWS

Thirty years after the 1983 first edition of this book, and sixteen years after the third, a fourth edition of *Golub and Van Loan*, as the book is usually called, has appeared. Although unfortunately Gene Golub passed away in 2007, Charles Van Loan continued work on this project, and the result is a beautiful high-quality hardcover with again more content, more pages, and more to learn at the ever-developing field of *Numerical Linear Algebra*.

As the book is well known, also among people who have less to do with Numerical Linear Algebra than its research community, I will not spend time describing the focus and content that has remained the same; instead, I would particularly like to mention a number of new topics that have established themselves into the standard material over the more recent history, such as pseudospectra, Hamiltonian and product eigenvalue problems, the matrix sign, square root and logarithm, the Jacobi-Davidson method, large and sparse Singular Value Decomposition frameworks, MultiGrid, preconditioning, Kronecker products, and tensor contractions and decompositions. In spite of the fact that the master bibliography has been removed and can now be found online, the book still has more pages than the third edition.

Another remarkable difference with the new edition is that small numerical examples have been removed from the text. This may at first sight seem a strange decision, but they are replaced by Matlab codes that can be run by the reader in order to create the examples by him- or herself. This also allows for creating similar experiments and the hope is that this increases insight.

All in all, my conclusion is that I am very happy with this new edition. In sixteen years, there have been many developments in the field, and many of them can now also be found and/or studied in *Golub and Van Loan*. The only disadvantage of the new edition that I can think of is that it weighs almost 1.8 kilograms. Fortunately, it also exists as e-book.

Jan Brandts