

<<矩阵计算>>

图书基本信息

书名：<<矩阵计算>>

13位ISBN编号：9787115346100

10位ISBN编号：7115346100

出版时间：2014-3

出版时间：人民邮电出版社

作者：[美] Gene H. Golub,[美] Charles F. Van Loan

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：<http://www.tushu007.com>

<<矩阵计算>>

内容概要

本书是数值计算领域的名著，系统介绍了矩阵计算的基本理论和方法。

内容包括：矩阵乘法、矩阵分析、线性方程组、正交化和最小二乘法、特征值问题、Lanczos方法、矩阵函数及专题讨论等。

书中的许多算法都有现成的软件包实现，每节后附有习题，并有注释和大量参考文献。

新版增加约四分之一内容，反映了近年来矩阵计算领域的飞速发展。

本书可作为高等院校数学系高年级本科生和研究生教材，亦可作为计算数学和工程技术人员参考书。

<<矩阵计算>>

作者简介

Gene H. Golub

(1932 - 2007) 美国科学院、工程院和艺术科学院院士，世界著名数值分析专家，现代矩阵计算奠基人，矩阵分解算法的主要贡献者。
生前曾任斯坦福大学教授。

Charles F. Van Loan

著名数值分析专家，美国康奈尔大学教授，曾任该校计算机科学系主任。
他于1973年在密歇根大学获得博士学位，师从Cleve Moler。

<<矩阵计算>>

书籍目录

1	Matrix Multiplication	1
1.1	Basic Algorithms and Notation	2
1.2	Structure and Efficiency	14
1.3	Block Matrices and Algorithms	22
1.4	Fast Matrix-Vector Products	33
1.5	Vectorization and Locality	43
1.6	Parallel Matrix Multiplication	49
2	Matrix Analysis	63
2.1	Basic Ideas from Linear Algebra	64
2.2	Vector Norms	68
2.3	Matrix Norms	71
2.4	The Singular Value Decomposition	76
2.5	Subspace Metrics	81
2.6	The Sensitivity of Square Systems	87
2.7	Finite Precision Matrix Computations	93
3	General Linear Systems	105
3.1	Triangular Systems	106
3.2	The LU Factorization	111
3.3	Roundoff Error in Gaussian Elimination	122
3.4	Pivoting	125
3.5	Improving and Estimating Accuracy	137
3.6	Parallel LU	144
4	Special Linear Systems	153
4.1	Diagonal Dominance and Symmetry	154
4.2	Positive Definite Systems	159
4.3	Banded Systems	176
4.4	Symmetric Indefinite Systems	186
4.5	Block Tridiagonal Systems	196
4.6	Vandermonde Systems	203
4.7	Classical Methods for Toeplitz Systems	208
4.8	Circulant and Discrete Poisson Systems	219
5	Orthogonalization and Least Squares	233
5.1	Householder and Givens Transformations	234
5.2	The QR Factorization	246
5.3	The Full-Rank Least Squares Problem	260
5.4	Other Orthogonal Factorizations	274
5.5	The Rank-Deficient Least Squares Problem	288
5.6	Square and Underdetermined Systems	298
6	Modified Least Squares Problems and Methods	303
6.1	Weighting and Regularization	304
6.2	Constrained Least Squares	313
6.3	Total Least Squares	320
6.4	Subspace Computations with the SVD	327
6.5	Updating Matrix Factorizations	334
7	Unsymmetric Eigenvalue Problems	347

<<矩阵计算>>

7.1	Properties and Decompositions	348
7.2	Perturbation Theory	357
7.3	Power Iterations	365
7.4	The Hessenberg and Real Schur Forms	376
7.5	The Practical QR Algorithm	385
7.6	Invariant Subspace Computations	394
7.7	The Generalized Eigenvalue Problem	405
7.8	Hamiltonian and Product Eigenvalue Problems	420
7.9	Pseudospectra	426
8	Symmetric Eigenvalue Problems	439
8.1	Properties and Decompositions	440
8.2	Power Iterations	450
8.3	The Symmetric QR Algorithm	458
8.4	More Methods for Tridiagonal Problems	467
8.5	Jacobi Methods	476
8.6	Computing the SVD	486
8.7	Generalized Eigenvalue Problems with Symmetry	497
9	Functions of Matrices	513
9.1	Eigenvalue Methods	514
9.2	Approximation Methods	522
9.3	The Matrix Exponential	530
9.4	The Sign, Square Root, and Log of a Matrix	536
10	Large Sparse Eigenvalue Problems	545
10.1	The Symmetric Lanczos Process	546
10.2	Lanczos, Quadrature, and Approximation	556
10.3	Practical Lanczos Procedures	562
10.4	Large Sparse SVD Frameworks	571
10.5	Krylov Methods for Unsymmetric Problems	579
10.6	Jacobi-Davidson and Related Methods	589
11	Large Sparse Linear System Problems	597
11.1	Direct Methods	598
11.2	The Classical Iterations	611
11.3	The Conjugate Gradient Method	625
11.4	Other Krylov Methods	639
11.5	Preconditioning	650
11.6	The Multigrid Framework	670
12	Special Topics	681
12.1	Linear Systems with Displacement Structure	681
12.2	Structured-Rank Problems	691
12.3	Kronecker Product Computations	707
12.4	Tensor Unfoldings and Contractions	719
12.5	Tensor Decompositions and Iterations	731
Index		747

<<矩阵计算>>

版权说明

本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问:<http://www.tushu007.com>