

Numerical Linear Algebra

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1. Introduction, Gaussian Elimination
2. LU Decomposition
3. Special Matrices
4. Norms; The Condition Number
5. The Full Rank Least Squares Problem
6. QR Factorization via Givens Rotations
7. QR Factorization via Householder Reflections
8. Gram-Schmidt Orthogonalization
9. Singular Value Decomposition
10. Singular Value Decomposition (cont'd), Least Squares with Linear Constraints
11. Method of Steepest Descent
12. Lanczos Iteration
13. The Conjugate Gradient Method
14. Other Krylov Subspace Methods
15. Eigenvalues: Definitions and Properties
16. Schur Decomposition, Jordan Canonical Form
17. Perturbation Theory; Power Iterations
18. Hessenberg QR
19. Shifted QR Iteration
20. The Symmetric Eigenvalue Problem
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22. Introduction to Statistical Learning

23. Principal Component Analysis

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