Localizing Ritz Values for Eigenvalue Computations

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Outline

Introduction

- Computing eigenvalues of large matrices
- Ritz values, exact shifts, algorithm failure
- Ritz values and pseudospectra
- The inverse field of values (iFOV) problem

Normal Matrices [Carden and Hansen, to appear]

- Complete solution of iFOV for $n = 3$ via Ceva's Theorem

Nonnormal Matrices [Carden and E., 2012]

- A computational example: Jordan block
- Localization by real part and magnitude (toward 'interlacing')
- Examples

Convergence of Eigenvalue Algorithms

- Location of exact shifts
- Monotonic convergence to a desired eigenvector