

Lecture 22

HW5 + HW6 posted due in 2 week due in 4 weeks

Question to think about: Arnoldi or Identity Matrix?

- Are the tests to determine if the $\underline{b}$ used in Arnoldi with limited accuracy? So we need to test ill-conditioned?

Why about Cholesky basis vs Arnoldi?

Is HW7 going to be graded? No HW7

How do you pick $\underline{b}$ s.t. V doesn't degenerate to zero?

How to find a better basis approx of A^{-1} ?

Arnoldi vs. Power Subspace why does Arnoldi help?

Are there disadvantages to Krylov methods?

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$$K_k(I, \underline{b}) = \text{Span}(\underline{b}, I\underline{b}, I^2\underline{b}, \dots, I^{k-1}\underline{b})$$

$$= \text{Span}(\underline{b})$$

$$A \underline{V}_k = U H_{k+1}$$

$$I \frac{\underline{b}}{\|\underline{b}\|} = \begin{bmatrix} \underline{b}/\|\underline{b}\| & \underline{v}_2 \end{bmatrix} \begin{bmatrix} H_{11} \\ H_{21} \end{bmatrix}$$

$$(I + \epsilon \epsilon^T)$$

$$A = Q_Y R_Y R_E^T Q_E^T$$

$$Y = Q_Y R_Y$$

$$E = R_E R_E^T$$

$$A = Q_Y R_Y R_E^T Q_E^T$$

$$y = 1 \times k$$

$$E = m \times k$$

$$k < m$$

$$A = Q_Y R_Y R_E^T Q_E^T$$

$$SVD(A)$$

$$R_Y R_E^T$$

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