MATLAB: University of California, Davis

Computer LAB for Linear Algebra   Dr. Daddel

MATH 22AL   LAB # 10

14   Normal matrix:

Definition An square matrix A is called **Normal** if

$$(\overline{A^T})A = A(\overline{A^T})$$

A unitary real matrix is called an orthogonal matrix.That is $AA' = A' = A = I$

Unitary matrices preserve norms, therefore, they preserve probability amplitudes.

As linear Transformation, Unitary matrices have significant importance in quantum mechanics.

Definition An square matrix A is called **Unitary** if

$$(\overline{A^H})A = A(\overline{A^H} = I)$$

Note that every Hermitian matrix A is normal.

15   Theorem

If A is square matrix with complex entries, then the following are equivalent:

a) A is unitarily diagonalizable. That is there is a Unitary matrix P such that $P^{-1}AP$ is diagonal.

b) A has an orthonormal set of n eigenvectors.

c) A is normal.