

The Diagonalization Theorem

Given the power of diagonalization, one wonders next, under what conditions can a matrix A be diagonalized?

The Diagonalization Theorem states that:

An $n \times n$ matrix A is diagonalizable if and only if A has n linearly independent eigenvectors. In fact, $A = PDP^{-1}$, with D a diagonal matrix, if and only if the columns of P are n linearly independent eigenvectors of A . In this case, the diagonal entries of D are eigenvalues of A that correspond, respectively, to the eigenvectors in P .