

Help with eigenvalue decomposition

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Hello,

I would be really grateful if someone could help me with the following problem (I apologize if the problem seems trivial).

Suppose we have a full-ranked symmetric matrix A , that can be represented as

$$A = B D B^T$$

where T denotes matrix transpose, B is a unitary matrix ($\text{inv}(B)=B^T$) and D is the diagonal matrix that contains the eigen values of A in increasing order. The elements of B are orthonormal eigenvectors of A .

Suppose we have another representation of A as

$$A = E F E^T$$

where E is again a unitary matrix, and F is a diagonal matrix with elements arranged in increasing order.

Is it correct to say that $F=D$ and $E=\text{Perm}(B)$ i.e. the columns of E are permutation of columns of B ? It would be very nice if you could point me out to references that discuss this problem?

Many thanks,
Amit.

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