

eigenvalue

Authors

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Abstract

An eigenvalue of a square matrix $\mathbf{A}$ is a number λ for which some nonzero vector $\mathbf{x}$ satisfies $\mathbf{Ax} = \lambda\mathbf{x}$. Such a vector is referred to as an eigenvector of $\mathbf{A}$. Multiplying an eigenvector by the matrix scales it by the eigenvalue without changing its direction. The eigenvalues of a diagonalizable matrix constitute the diagonal factor of its eigenvalue decomposition (EVD).

Definition

A number $\lambda \in \mathbb{R}$ is called an eigenvalue of a square matrix $\mathbf{A} \in \mathbb{R}^{d \times d}$ if there exists a nonzero vector $\mathbf{x} \in \mathbb{R}^d \setminus \{\mathbf{0}\}$ such that $\mathbf{Ax} = \lambda\mathbf{x}$ (see Fig. 1).

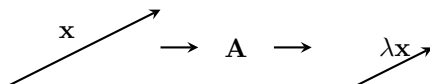


Figure 1: Eigenvector corresponding to the eigenvalue λ .

Cross References

matrix, eigenvector

References

- 1.