

1. Record Nr.	UNINA9910830377103321
Autore	Favier Gerard
Titolo	Matrix and tensor decompositions in signal processing . Volume 2 / / Gerard Favier
Pubbl/distr/stampa	London, England : , : ISTE Ltd, , [2021] 2021
ISBN	1-119-70098-1 1-119-70099-X 1-119-70096-5
Descrizione fisica	1 online resource (386 pages)
Collana	Digital signal and image processing series. Matrices and tensors in signal processing set.
Disciplina	005.1
Soggetti	Signal processing - Digital techniques - Mathematics Computer algorithms Calculus of tensors Matrices Algorithms
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Table of Contents -- Title Page -- Copyright -- Introduction -- I.1. What are the advantages of tensor approaches? -- I.2. For what uses? -- I.3. In what fields of application? -- I.4. With what tensor decompositions? -- I.5. With what cost functions and optimization algorithms? -- I.6. Brief description of content -- 1 Matrix Decompositions -- 1.1. Introduction -- 1.2. Overview of the most common matrix decompositions -- 1.3. Eigenvalue decomposition -- 1.4. URVH decomposition -- 1.5. Singular value decomposition -- 1.6. CUR decomposition -- 2 Hadamard, Kronecker and Khatri-Rao Products -- 2.1. Introduction -- 2.2. Notation -- 2.3. Hadamard product -- 2.4. Kronecker product -- 2.5. Kronecker sum -- 2.6. Index convention -- 2.7. Commutation matrices -- 2.8. Relations between the diag operator and the Kronecker product -- 2.9. Khatri-Rao product -- 2.10. Relations between vectorization and Kronecker and Khatri-Rao products -- 2.11. Relations between the Kronecker, Khatri-

Rao and Hadamard products -- 2.12. Applications -- 3 Tensor Operations -- 3.1. Introduction -- 3.2. Notation and particular sets of tensors -- 3.3. Notion of slice -- 3.4. Mode combination -- 3.5. Partitioned tensors or block tensors -- 3.6. Diagonal tensors -- 3.7. Matricization -- 3.8. Subspaces associated with a tensor and multilinear rank -- 3.9. Vectorization -- 3.10. Transposition -- 3.11. Symmetric/partially symmetric tensors -- 3.12. Triangular tensors -- 3.13. Multiplication operations -- 3.14. Inverse and pseudo-inverse tensors -- 3.15. Tensor decompositions in the form of factorizations -- 3.16. Inner product, Frobenius norm and trace of a tensor -- 3.17. Tensor systems and homogeneous polynomials -- 3.18. Hadamard and Kronecker products of tensors -- 3.19. Tensor extension -- 3.20. Tensorization -- 3.21. Hankelization.
 4 Eigenvalues and Singular Values of a Tensor -- 4.1. Introduction -- 4.2. Eigenvalues of a tensor of order greater than two -- 4.3. Best rank-one approximation -- 4.4. Orthogonal decompositions -- 4.5. Singular values of a tensor -- 5 Tensor Decompositions -- 5.1. Introduction -- 5.2. Tensor models -- 5.3. Examples of tensor models -- Appendix Random Variables and Stochastic Processes -- A1.1. Introduction -- A1.2. Random variables -- A1.3. Discrete-time random signals -- A1.4. Application to system identification -- References -- Index -- End User License Agreement.

Sommario/riassunto

The second volume will deal with a presentation of the main matrix and tensor decompositions and their properties of uniqueness, as well as very useful tensor networks for the analysis of massive data. Parametric estimation algorithms will be presented for the identification of the main tensor decompositions. After a brief historical review of the compressed sampling methods, an overview of the main methods of retrieving matrices and tensors with missing data will be performed under the low rank hypothesis. Illustrative examples will be provided.
