

1. Record Nr.	UNINA9910886080603321
Autore	Taguchi Y-h
Titolo	Unsupervised Feature Extraction Applied to Bioinformatics : A PCA Based and TD Based Approach // by Y-h. Taguchi
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2024
ISBN	3-031-60982-4
Edizione	[2nd ed. 2024.]
Descrizione fisica	1 online resource (542 pages)
Collana	Unsupervised and Semi-Supervised Learning, , 2522-8498
Disciplina	621.382
Soggetti	Telecommunication Bioinformatics Signal processing Pattern recognition systems Data mining Communications Engineering, Networks Computational and Systems Biology Signal, Speech and Image Processing Automated Pattern Recognition Data Mining and Knowledge Discovery
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction to linear algebra -- Matrix factorization -- Tensor decompositions -- PCA based unsupervised FE -- TD based unsupervised FE -- Application of PCA based unsupervised FE to bioinformatics -- Application of TD based unsupervised FE to bioinformatics -- Theoretical investigation of TD and PCA based unsupervised FE.
Sommario/riassunto	This updated book proposes applications of tensor decomposition to unsupervised feature extraction and feature selection. The author posits that although supervised methods including deep learning have become popular, unsupervised methods have their own advantages. He argues that this is the case because unsupervised methods are easy to learn since tensor decomposition is a conventional linear methodology. This book starts from very basic linear algebra and reaches the cutting

edge methodologies applied to difficult situations when there are many features (variables) while only small number of samples are available. The author includes advanced descriptions about tensor decomposition including Tucker decomposition using high order singular value decomposition as well as higher order orthogonal iteration, and train tensor decomposition. The author concludes by showing unsupervised methods and their application to a wide range of topics. Allows readers to analyze data sets with small samples and many features; Provides a fast algorithm, based upon linear algebra, to analyze big data; Includes several applications to multi-view data analyses, with a focus on bioinformatics.

---