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Titolo	Tensor numerical methods in scientific computing / / Boris N. Khoromskij
Pubbl/distr/stampa	Berlin ; ; Munich ; ; Boston : , : De Gruyter, , [2018] ©2018
ISBN	3-11-039139-2 3-11-036591-X
Descrizione fisica	1 online resource (382 pages)
Collana	Radon Series on Computational and Applied Mathematics ; ; 19
Disciplina	515.63
Soggetti	Calculus of tensors
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Frontmatter -- Contents -- 1. Introduction -- 2. Theory on separable approximation of multivariate functions -- 3. Multilinear algebra and nonlinear tensor approximation -- 4. Superfast computations via quantized tensor approximation -- 5. Tensor approach to multidimensional integrodifferential equations -- Bibliography -- Index
Sommario/riassunto	The most difficult computational problems nowadays are those of higher dimensions. This research monograph offers an introduction to tensor numerical methods designed for the solution of the multidimensional problems in scientific computing. These methods are based on the rank-structured approximation of multivariate functions and operators by using the appropriate tensor formats. The old and new rank-structured tensor formats are investigated. We discuss in detail the novel quantized tensor approximation method (QTT) which provides function-operator calculus in higher dimensions in logarithmic complexity rendering super-fast convolution, FFT and wavelet transforms. This book suggests the constructive recipes and computational schemes for a number of real life problems described by the multidimensional partial differential equations. We present the theory and algorithms for the sinc-based separable approximation of the analytic radial basis functions including Green's and Helmholtz kernels. The efficient tensor-based techniques for computational problems in electronic structure calculations and for the grid-based

	evaluation of long-range interaction potentials in multi-particle systems are considered. We also discuss the QTT numerical approach in many-particle dynamics, tensor techniques for stochastic/parametric PDEs as well as for the solution and homogenization of the elliptic equations with highly-oscillating coefficients. Contents Theory on separable approximation of multivariate functions Multilinear algebra and nonlinear tensor approximation Superfast computations via quantized tensor approximation Tensor approach to multidimensional integrodifferential equations

2.

Record Nr.	UNINA9910830304003321
Autore	Bosq Denis <1939->
Titolo	Inference and prediction in large dimensions [[electronic resource] /] / Denis Bosq, Delphine Blanke
Pubbl/distr/stampa	Chichester, England ; ; Hoboken, NJ, : John Wiley/Dunod, c2007
ISBN	1-282-12309-2 9786612123092 0-470-72403-X 0-470-72402-1
Descrizione fisica	1 online resource (338 p.)
Collana	Wiley series in probability and statistics
Altri autori (Persone)	BlankeDelphine
Disciplina	519.5/44 519.54
Soggetti	Estimation theory Nonparametric statistics Stochastic processes Prediction theory
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"This work is in the Wiley-Dunod Series co-published between Dunod and John Wiley & Sons, Ltd."
Nota di bibliografia	Includes bibliographical references (p. [299]-307) and index.
Nota di contenuto	Inference and Prediction in Large Dimensions; Contents; List of abbreviations; Introduction; Part I Statistical Prediction Theory; 1 Statistical prediction; 1.1 Filtering; 1.2 Some examples; 1.3 The prediction model; 1.4 P-sufficient statistics; 1.5 Optimal predictors; 1.6

Efficient predictors; 1.7 Loss functions and empirical predictors; 1.7.1 Loss function; 1.7.2 Location parameters; 1.7.3 Bayesian predictors; 1.7.4 Linear predictors; 1.8 Multidimensional prediction; Notes; 2 Asymptotic prediction; 2.1 Introduction; 2.2 The basic problem; 2.3 Parametric prediction for stochastic processes
2.4 Predicting some common processes2.5 Equivalent risks; 2.6 Prediction for small time lags; 2.7 Prediction for large time lags; Notes; Part II Inference by Projection; 3 Estimation by adaptive projection; 3.1 Introduction; 3.2 A class of functional parameters; 3.3 Oracle; 3.4 Parametric rate; 3.5 Nonparametric rates; 3.6 Rate in uniform norm; 3.7 Adaptive projection; 3.7.1 Behaviour of truncation index; 3.7.2 Superoptimal rate; 3.7.3 The general case; 3.7.4 Discussion and implementation; 3.8 Adaptive estimation in continuous time; Notes; 4 Functional tests of fit
4.1 Generalized chi-square tests4.2 Tests based on linear estimators; 4.2.1 Consistency of the test; 4.2.2 Application; 4.3 Efficiency of functional tests of fit; 4.3.1 Adjacent hypotheses; 4.3.2 Bahadur efficiency; 4.4 Tests based on the uniform norm; 4.5 Extensions. Testing regression; 4.6 Functional tests for stochastic processes; Notes; 5 Prediction by projection; 5.1 A class of nonparametric predictors; 5.2 Guilbart spaces; 5.3 Predicting the conditional distribution; 5.4 Predicting the conditional distribution function; Notes; Part III Inference by Kernels
6 Kernel method in discrete time6.1 Presentation of the method; 6.2 Kernel estimation in the i.i.d. case; 6.3 Density estimation in the dependent case; 6.3.1 Mean-square error and asymptotic normality; 6.3.2 Almost sure convergence; 6.4 Regression estimation in the dependent case; 6.4.1 Framework and notations; 6.4.2 Pointwise convergence; 6.4.3 Uniform convergence; 6.5 Nonparametric prediction by kernel; 6.5.1 Prediction for a stationary Markov process of order k; 6.5.2 Prediction for general processes; Notes; 7 Kernelmethodin continuous time
7.1 Optimal and superoptimal rates for density estimation7.1.1 The optimal framework; 7.1.2 The superoptimal case; 7.2 From optimal to superoptimal rates; 7.2.1 Intermediate rates; 7.2.2 Classes of processes and examples; 7.2.3 Mean-square convergence; 7.2.4 Almost sure convergence; 7.2.5 An adaptive approach; 7.3 Regression estimation; 7.3.1 Pointwise almost sure convergence; 7.3.2 Uniform almost sure convergence; 7.4 Nonparametric prediction by kernel; Notes; 8 Kernel method from sampled data; 8.1 Density estimation; 8.1.1 High rate sampling; 8.1.2 Adequate sampling schemes
8.2 Regression estimation

Sommario/riassunto

This book offers a predominantly theoretical coverage of statistical prediction, with some potential applications discussed, when data and/or parameters belong to a large or infinite dimensional space. It develops the theory of statistical prediction, non-parametric estimation by adaptive projection - with applications to tests of fit and prediction, and theory of linear processes in function spaces with applications to prediction of continuous time processes. This work is in the Wiley-Dunod Series co-published between Dunod (www.dunod.com) and John Wil