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Titolo	Recent applications of harmonic analysis to function spaces, differential equations, and data science : novel methods in harmonic analysis, volume 2 // edited by Isaac Pesenson, Quoc Thong Le Gia, Azita Mayeli, Hrushikesh Mhaskar, Ding-Xuan Zhou
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Descrizione fisica	1 online resource (512 pages) : illustrations
Collana	Applied and Numerical Harmonic Analysis, , 2296-5009
Disciplina	515.2433
Soggetti	Harmonic analysis Fourier analysis Numerical analysis Big data Computer mathematics Abstract Harmonic Analysis Fourier Analysis Numerical Analysis Big Data Computational Science and Engineering
Lingua di pubblicazione	Inglese
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Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Introduction -- Characterization of Gevrey Regularity by a Class of FBI Transforms -- A Novel Mathematical Approach to the Theory of Translation Invariant Linear Systems -- Asymptotic Behaviour of the Fourier Transform of a Function of Bounded Variation -- Convergence and Regularization of Sampling Series -- Harmonic Analysis in Non-Euclidean Spaces: Theory and Application -- An Harmonic Analysis of Directed Graphs from Arithmetic Functions and Primes -- Sheaf and Duality Methods for Analyzing Multi-Model Systems -- On Boundary-Value Problems for a Partial Differential Equation with Caputo and Bessel Operator -- On the Solvability of the Zaremba Problem in Infinite Sectors and the Invertibility of Associated Singular Integral Operators

-- On the Solution of the Oblique Derivative Problem by Constructive Runge-Walsh Concepts -- An Overview of Numerical Acceleration Techniques for Non-Linear Dimension Reduction -- Adaptive Density Estimation on the Circle by Nearly-Tight Frames -- Interactions between Kernels, Frames, and Persistent Homology -- Multi-Penalty Regularization for Detecting Relevant Variables -- Stable Likelihood Computation for Gaussian Random Fields.

Sommario/riassunto

The second of a two volume set on novel methods in harmonic analysis, this book draws on a number of original research and survey papers from well-known specialists detailing the latest innovations and recently discovered links between various fields. Along with many deep theoretical results, these volumes contain numerous applications to problems in signal processing, medical imaging, geodesy, statistics, and data science. The chapters within cover an impressive range of ideas from both traditional and modern harmonic analysis, such as: the Fourier transform, Shannon sampling, frames, wavelets, functions on Euclidean spaces, analysis on function spaces of Riemannian and sub-Riemannian manifolds, Fourier analysis on manifolds and Lie groups, analysis on combinatorial graphs, sheaves, co-sheaves, and persistent homologies on topological spaces. Volume II is organized around the theme of recent applications of harmonic analysis to function spaces, differential equations, and data science, covering topics such as: The classical Fourier transform, the non-linear Fourier transform (NLF transform), cardinal sampling series and translation invariant linear systems. Recent results concerning harmonic analysis on non-Euclidean spaces such as graphs and partially ordered sets. Applications of harmonic analysis to data science and statistics. Boundary-value problems for PDE's including the Runge–Walsh theorem for the oblique derivative problem of physical geodesy.
