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Sommario/riassunto

Discover applications of Fourier analysis on finite non-Abelian groups The majority of publications in spectral techniques consider Fourier transform on Abelian groups. However, non-Abelian groups provide notable advantages in efficient implementations of spectral methods. Fourier Analysis on Finite Groups with Applications in Signal Processing and System Design examines aspects of Fourier analysis on finite non-Abelian groups and discusses different methods used to determine compact representations for discrete functions providing for their efficient realizations and related applications. Switching functions are included as an example of discrete functions in engineering practice. Additionally, consideration is given to the polynomial expressions and decision diagrams defined in terms of Fourier transform on finite non-Abelian groups. A solid foundation of this complex topic is provided by beginning with a review of signals and their mathematical models and

Fourier analysis. Next, the book examines recent achievements and discoveries in: . Matrix interpretation of the fast Fourier transform. Optimization of decision diagrams. Functional expressions on quaternion groups. Gibbs derivatives on finite groups. Linear systems on finite non-Abelian groups. Hilbert transform on finite groups Among the highlights is an in-depth coverage of applications of abstract harmonic analysis on finite non-Abelian groups in compact representations of discrete functions and related tasks in signal processing and system design, including logic design. All chapters are self-contained, each with a list of references to facilitate the development of specialized courses or self-study. With nearly 100 illustrative figures and fifty tables, this is an excellent textbook for graduate-level students and researchers in signal processing, logic design, and system theory-as well as the more general topics of computer science and applied mathematics.