Spectral Logic and Its Applications for the Design of Digital Devices
Mark G. Karpovsky, Radomir S. Stankovic, Jaakko T. Astola

**DESCRIPTION**

Spectral techniques facilitate the design and testing of today's increasingly complex digital devices.

There is heightened interest in spectral techniques for the design of digital devices dictated by ever increasing demands on technology that often cannot be met by classical approaches. Spectral methods provide a uniform and consistent theoretic environment for recent achievements in this area, which appear divergent in many other approaches. Spectral Logic and Its Applications for the Design of Digital Devices gives readers a foundation for further exploration of abstract harmonic analysis over finite groups in the analysis, design, and testing of digital devices. After an introduction, this book provides the essential mathematical background for discussing spectral methods. It then delves into spectral logic and its applications, covering:

* Walsh, Haar, arithmetic transform, Reed-Muller transform for binary-valued functions and Vilenkin-Chrestenson transform, generalized Haar, and other related transforms for multiple-valued functions

* Polynomial expressions and decision diagram representations for switching and multiple-value functions

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Spectral analysis of Boolean functions

Spectral synthesis and optimization of combinational and sequential devices

Spectral methods in analysis and synthesis of reliable devices

Spectral techniques for testing computer hardware

This is the authoritative reference for computer science and engineering professionals and researchers with an interest in spectral methods of representing discrete functions and related applications in the design and testing of digital devices. It is also an excellent text for graduate students in courses covering spectral logic and its applications.

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**ABOUT THE AUTHOR**

**Mark G. Karpovsky, PhD** is Professor of Computer Engineering at the College of Engineering and Director of Reliable Computing Laboratory, both at Boston University. Dr. Karpovsky authored the classic reference *Finite Orthogonal Series in the Design of Digital Devices* (Wiley). He has published more than 150 research papers and several books on the design of reliable computer and communications networks.

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