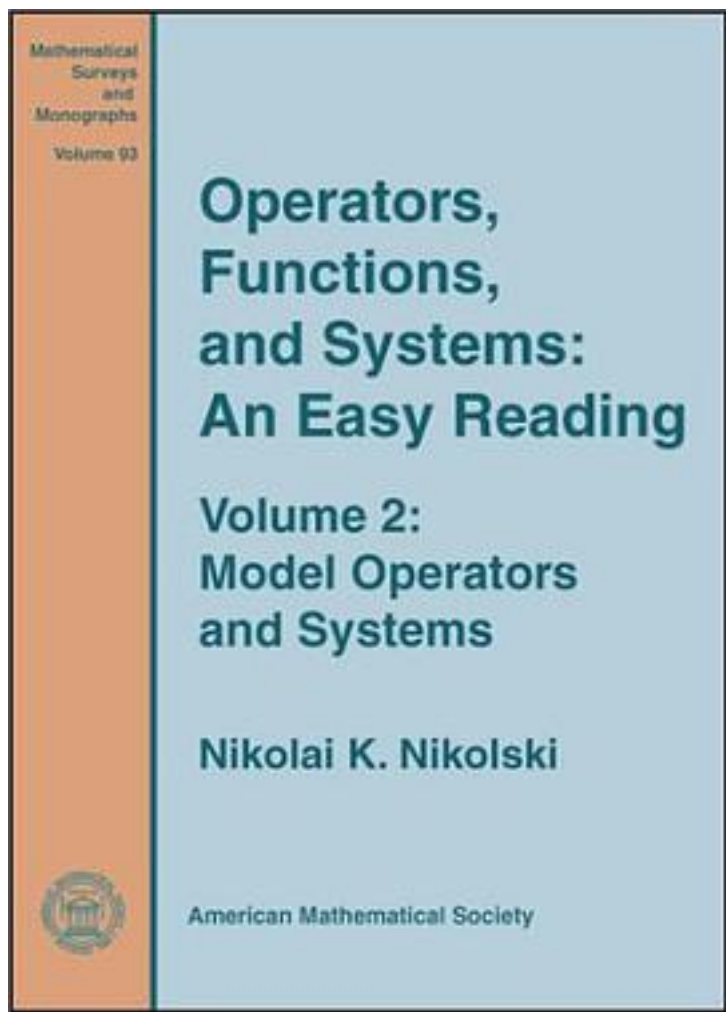


Operators, Functions, and Systems



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This unique work combines together in two volumes four formally distinct topics of

modern analysis and its applications:

A. Hardy classes of holomorphic functions

B. Spectral theory of Hankel and Toeplitz operators

C. Function models for linear operators and free interpolations, and

D. Infinite-dimensional system theory and signal processing

Volume I Hardy, Hankel, and Toeplitz contains parts A and B; this volume, Volume II, contains Parts C and D.

Hardy classes of holomorphic functions: This topic is known to be the most powerful tool of complex analysis for a variety of applications, starting with Fourier series, through the Riemann zeta-function, all the way to Wiener's theory of signal processing.

Spectral theory of Hankel and Toeplitz operators: These now become the supporting pillars for a large part of harmonic and complex analysis and for many of their applications. In this book, moment problems, Nevanlinna-Pick and Carathéodory interpolation, and best rational approximations are considered to illustrate the power of Hankel and Toeplitz operators.

Function models for linear operators and free interpolation: This is a universal topic and, indeed, is the most influential operator theory technique in the post-spectral-theorem era. In this book, its capacity is tested by solving generalized Carleson-type interpolation problems.

Infinite-dimensional system theory and signal processing: This topic is the touchstone of the three previously developed techniques. The presence of this applied topic in a pure mathematic environment reflects important changes in the mathematical landscape of the last 20 years, in that the role of the main consumer and customer of harmonic, complex, and operator analysis has more and more passed from differential equations, scattering theory, and probability, to control theory and signal processing.

These volumes are geared toward a wide audience of readers, from graduate students to professional mathematicians. They develop an elementary approach while retaining an expert level that can be applied in advanced analysis and selected applications.

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