
A systematic, unified treatment of orthogonal transform methods for signal processing, data analysis, and communications, this book guides the reader from mathematical theory to problem solving in practice. It examines each transform method in depth, emphasizing the common mathematical principles and essential properties of each method in terms of signal decorrelation and energy compaction. The different forms of Fourier transform, as well as the Laplace, Z-, Walsh-Hadamard, slant, Haar, Karhunen-Loéve, and wavelet transforms, are all covered, with discussion of how these transform methods can be applied to real-world problems. Numerous practical examples and end-of-chapter problems, supported by online Matlab and C code and an instructor-only solutions manual, make this an ideal resource for students and practitioners alike.

**Ruye Wang** is a Professor in the Engineering Department at Harvey Mudd College. Previously a Principal Investigator at the Jet Propulsion Laboratory, NASA, his research interests include image processing, computer vision, machine learning, and remote sensing.