Hyperspectral Data Processing: Algorithm Design and Analysis

By Chein-I Chang

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Hyperspectral Data Processing: Algorithm Design and Analysis is a culmination of the research conducted in the Remote Sensing Signal and Image Processing Laboratory (RSSIPL) at the University of Maryland, Baltimore County. Specifically, it treats hyperspectral image processing and hyperspectral signal processing as separate subjects in two different categories. Most materials covered in this book can be used in conjunction with the author's first book, *Hyperspectral Imaging: Techniques for Spectral Detection and Classification,* without much overlap.

Many results in this book are either new or have not been explored, presented, or published in the public domain. These include various aspects of endmember extraction, unsupervised linear spectral mixture analysis, hyperspectral information compression, hyperspectral signal coding and characterization, as well as applications to conceal target detection, multispectral imaging, and magnetic resonance imaging. *Hyperspectral Data Processing* contains eight major sections:

- Part I: provides fundamentals of hyperspectral data processing
- Part II: offers various algorithm designs for endmember extraction
- Part III: derives theory for supervised linear spectral mixture analysis
- Part IV: designs unsupervised methods for hyperspectral image analysis
- Part V: explores new concepts on hyperspectral information compression
- Parts VI & VII: develops techniques for hyperspectral signal coding and characterization
- Part VIII: presents applications in multispectral imaging and magnetic resonance imaging

Hyperspectral Data Processing compiles an algorithm compendium with MATLAB codes in an appendix to help readers implement many important algorithms developed in this book and write their own program codes without relying on software packages.

Hyperspectral Data Processing is a valuable reference for those who have been involved with hyperspectral imaging and its techniques, as well those who are new to the subject.

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