

# **Hyperspectral Data Exploitation: Theory and Applications**

## **Edited by Chein-I Chang**

### **Table of Contents**

#### **1. Chapter 1: Overview**

Chein-I Chang

Remote Sensing Signal and Image Processing Laboratory

University of Maryland, Baltimore County, Baltimore, MD, USA

#### **PRAT I: TUTORALS**

#### **2. Chapter 2: Hyperspectral Imaging Systems**

John P. Kerekes and John R. Schott

Chester F. Carlson Center for Imaging Science

Rochester Institute of Technology, Rochester, N.Y., USA

#### **3. Chapter 3: Information-Processed Matched Filters for Hyperspectral Target Detection and Classification**

Chein-I Chang

Remote Sensing Signal and Image Processing Laboratory

Department of Computer Science and Electrical Engineering

University of Maryland, Baltimore County, Baltimore, MD, USA

#### **PRAT II: THEORY**

#### **4. Chapter 4: An Optical Real-Time Adaptive Spectral Identification System (ORASIS)**

Jeffery H. Bowles and David B. Gillis

Remote Sensing Division

Naval Research Laboratory, Washington DC, USA

#### **5. Chapter 5: Stochastic Mixture Modeling**

Michael T. Eismann<sup>1</sup> and David W. J. Stein<sup>2</sup>

<sup>1</sup>AFRL's Sensors Directorate, Electro Optical Technology Division

Electro Optical Targeting Branch, Wright-Patterson AFB OH, USA

<sup>2</sup>MIT Lincoln Laboratory, Boston, MA, USA

#### **6. Chapter 6: Unmixing Hyperspectral Data: Independent and Dependent Component Analysis**

Jose M.P. Nascimento<sup>1</sup> and Jose M.B. Dias<sup>2</sup>

<sup>1</sup>Instituto Superior De Engenharia de Lisboa

<sup>2</sup>Instituto de Telecomunications, Lisbon, Portugal

**7. Chapter 7: Maximum Volume Transform For Endmember Spectra Determination**

Michael E. Winter

Hawaii Institute of Geophysics and Planetology

University of Hawaii, Honolulu, HI, USA

**8. Chapter 8: Hyperspectral Data Representation**

X. Jia<sup>1</sup> and John A. Richards<sup>2</sup>

<sup>1</sup>Australian Defense Force Academy, Australia

<sup>2</sup>The Australia National University, Australia

**9. Chapter 9: Optimal Band Selection and Utility Evaluation for Spectral Systems**

Sylvia S. Shen

The Aerospace Corporation, USA

**10. Chapter 10: Feature Reduction for Classification Purpose**

Sebastiano B. Serpico, Gabriele Moser and Andrea F. Cattoni

Department of Biophysics and Electronic Engineering

University of Genoa, Genoa, Italy

**11. Chapter 11: Semi-supervised Support Vector Machines for Classification of Hyperspectral Remote Sensing Images**

Lorenzo Bruzzone, Mingmin Chi, Mattia Marconcini

Department of Information and Communication Technology

University of Trento, Italy

**PRAT III: APPLICATIONS**

**12. Chapter 12: Decision Fusion for Hyperspectral Classification**

Jon Atli Benediktsson, Jocelyn Chanussot and Mathieu Fauvel

Department of Electrical and Computer Engineering, University of Iceland,

Iceland

**13. Chapter 13: Morphological Hyperspectral Image Classification: A Parallel Processing Perspective**

Antonio J. Plaza

Computer Science Department, University of Extremadura, Avda. de la

Universidad s/n, 10071 Caceres, SPAIN

## **14. Chapter 14: 3D Wavelet-Based Compression of Hyperspectral Imagery**

James E. Fowler and Justin T. Rucker

Department of Electrical and Computer Engineering, GeoResources Institute  
Mississippi State University, USA