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Nota di contenuto	HYPERSPECTRAL DATA PROCESSING: Algorithm Design and Analysis; CONTENTS; PREFACE; 1 OVERVIEW AND INTRODUCTION; 1.1 Overview; 1.2 Issues of Multispectral and Hyperspectral Imageries; 1.3 Divergence of Hyperspectral Imagery from Multispectral Imagery; 1.3.1 Misconception: Hyperspectral Imaging is a Natural Extension of Multispectral Imaging; 1.3.2 Pigeon-Hole Principle: Natural Interpretation of Hyperspectral Imaging; 1.4 Scope of This Book; 1.5 Book's Organization; 1.5.1 Part I: Preliminaries; 1.5.2 Part II: Endmember Extraction; 1.5.3 Part III: Supervised Linear Hyperspectral Mixture Analysis 1.5.4 Part IV: Unsupervised Hyperspectral Analysis 1.5.5 Part V: Hyperspectral Information Compression; 1.5.6 Part VI: Hyperspectral Signal Coding; 1.5.7 Part VII: Hyperspectral Signal Feature Characterization; 1.5.8 Applications; 1.5.8.1 Chapter 30: Applications

of Target Detection; 1.5.8.2 Chapter 31: Nonlinear Dimensionality Expansion to Multispectral Imagery; 1.5.8.3 Chapter 32: Multispectral Magnetic Resonance Imaging; 1.6 Laboratory Data to be Used in This Book; 1.6.1 Laboratory Data; 1.6.2 Cuprite Data; 1.6.3 NIST/EPA Gas-Phase Infrared Database

1.7 Real Hyperspectral Images to be Used in this Book 1.7.1 AVIRIS Data; 1.7.1.1 Cuprite Data; 1.7.1.2 Purdue's Indiana Indian Pine Test Site; 1.7.2 HYDICE Data; 1.8 Notations and Terminologies to be Used in this Book; I: PRELIMINARIES; 2 FUNDAMENTALS OF SUBSAMPLE AND MIXED SAMPLE ANALYSES; 2.1 Introduction; 2.2 Subsample Analysis; 2.2.1 Pure-Sample Target Detection; 2.2.2 Subsample Target Detection; 2.2.2.1 Adaptive Matched Detector (AMD); 2.2.2.2 Adaptive Subspace Detector (ASD); 2.2.3 Subsample Target Detection: Constrained Energy Minimization (CEM); 2.3 Mixed Sample Analysis

2.3.1 Classification with Hard Decisions 2.3.1.1 Fisher's Linear Discriminant Analysis (FLDA); 2.3.1.2 Support Vector Machines (SVM); 2.3.2 Classification with Soft Decisions; 2.3.2.1 Orthogonal Subspace Projection (OSP); 2.3.2.2 Target-Constrained Interference-Minimized Filter (TCIMF); 2.4 Kernel-Based Classification; 2.4.1 Kernel Trick Used in Kernel-Based Methods; 2.4.2 Kernel-Based Fisher's Linear Discriminant Analysis (KFLDA); 2.4.3 Kernel Support Vector Machine (K-SVM); 2.5 Conclusions; 3 THREE-DIMENSIONAL RECEIVER OPERATING CHARACTERISTICS (3D ROC) ANALYSIS; 3.1 Introduction

3.2 Neyman-Pearson Detection Problem Formulation 3.3 ROC Analysis; 3.4 3D ROC Analysis; 3.5 Real Data-Based ROC Analysis; 3.5.1 How to Generate ROC Curves from Real Data; 3.5.2 How to Generate Gaussian-Fitted ROC Curves; 3.5.3 How to Generate 3D ROC Curves; 3.5.4 How to Generate 3D ROC Curves for Multiple Signal Detection and Classification; 3.6 Examples; 3.6.1 Hyperspectral Imaging; 3.6.1.1 Hyperspectral Target Detection; 3.6.1.2 Linear Hyperspectral Mixture Analysis; 3.6.2 Magnetic Resonance (MR) Breast Imaging; 3.6.2.1 Breast Tumor Detection; 3.6.2.2 Brain Tissue Classification

3.6.3 Chemical/Biological Agent Detection

Sommario/riassunto

"This book is intended to be a sequel from the author's other title with Kluwer "Hyperspectral Imaging: Techniques for Spectral Detection and Classification". It contains five major parts. Part I is new aspects of OSP including 7 chapters, OSP revisit, generalized OSP, FPGA designs for OSP and CEM, Kalman filter-based linear unmixing, least squares fully constrained linear mixture analysis, exploitation-based hyperspectral data compression and size estimation of supixel targets, Part II is interference rejection for linear unmixing composed of three chapters, signal-composed interference-annihilated theory, interference-annihilated noise-adjusted theory and information-processed matched filter theory; Part III is nonlinear non-linear techniques for linear unmixing consisting of 3 chapters, convex cone analysis, information theoretic criterion-based project pursuit and nonlinear mixing model analysis; Part IV is spectral coding comprising of three chapters, progressive spectral coding, spectral binary coding and spectral coding for band selection; Part V is applications made up of two chapters, applications to magnetic resonance imaging and landmine detection"--