

Preface

Hyperspectral imaging has become one of most promising and emerging techniques in remote sensing. It has made great advance in recent years due to introduction of new techniques from versatile disciplines, particularly statistical signal processing from engineering aspects. Such clear evidence can be witnessed by hundreds of articles published in journals and conference proceedings every year as well as many annual conferences held in various venues. The rapid growth in this subject has made many researchers difficult to keep up with new developments and advances in its technology. Despite that many books have been published in the area of remote sensing image processing, most have been focused on multispectral image processing rather than hyperspectral signal/image processing. Until recently, only a few appeared as book forms in this particular field. One example is my first book, *Hyperspectral Imaging: Spectral Techniques for Detection and Classification* published in 2003 by Kluwer/Plenum Academic Publishers (now is part of Springer-Verlag Publishers) which was primarily written for subpixel detection and mixed pixel classification that were designed and developed in my laboratory. Unfortunately, many other topics are also of interest, but were not covered in this particular book. In order to address this need, I have made significant effort to invite experts in hyperspectral imaging from academia and industries to write chapters in their expertise and share their research works with readers. This book is essentially a result of their contributions. A total of 13 chapters (Chapter 2-Chapter 14) are included in this book and cover a wide spectrum of topics in hyperspectral data exploitation ranging from imaging systems, data modeling, data representation, band selection and partition, classification to data compression. Each chapter has been contributed by an expert in his/her specialty or experts in their specialties. Also included is Chapter 1: Overview written by me which provides readers with a discussion on design philosophy in developing hyperspectral imaging techniques from a hyperspectral imagery point of view as well as brief reviews of each of the 13 chapters including coherent connections among different chapters. Therefore, this chapter can serve as a guide to direct readers to particular topics in which they are interested.

The ultimate goal of this book is to offer readers with a peek of the cutting-edge research in hyperspectral data exploitation. In particular, this book can be found very useful for practitioners and engineers who are interested in this area. Hopefully, the chapters presented in this book have just done that.

Last but not least, I would like to thank all contributors for their participation in this book project. I owe them a great debt of gratitude for their efforts which make this book possible. This book cannot be completed without their contributions.

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