

High-Performance Computing in Remote Sensing

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I. GENERAL:

Chapter 1. *Specific issues about high-performance computing in remote sensing: non-literal analysis versus image-based processing*

Authors: Antonio J. Plaza, University of Extremadura, and Chein-I Chang, University of Maryland Baltimore County.

Chapter 2. *High-performance computing in remote sensing: where from, and a look-ahead in the future*

Author: J. Anthony Gualtieri, NASA Goddard Space Flight Center.

Chapter 3. *Generalization of high-performance computing in remote sensing to different areas: Part I: Case studies in medical imaging and chemical/biological defense*

Authors: Chein-I Chang, University of Maryland Baltimore County, and Antonio J. Plaza, University of Extremadura.

Chapter 4. *Part II: Computer architectures for multimedia and video analysis*

Authors: Emilio L. Zapata and Nicolas Guil, University of Málaga.

II. MULTICOMPUTER SYSTEMS:

Chapter 5. *Parallel adaptive reduction of high-dimensional remote sensing data*

Author: Jacqueline Le Moigne, NASA Goddard Space Flight Center.

Chapter 6. *Parallel implementation of the ORASIS algorithm for remote sensing data analysis*

Authors: David Gillis and Jeffrey Bowles, Naval Research Laboratory.

Chapter 7. *Parallel implementation of the recursive approximation of a hierarchical unsupervised segmentation algorithm*

Author: James C. Tilton, NASA Goddard Space Flight Center.

Chapter 8. *Distributed computing for inverse modeling of hyperspectral data*

Authors: Gregory P. Asner and David E. Knapp, Carnegie Institution, Stanford.

Chapter 9. *Parallel implementation of neural network models for remote sensing data analysis*

Authors: Jose M. Cela, Polytechnic University of Catalonia, Javier Plaza, Rosa M. Pérez and Carmen Cantero, University of Extremadura.

Chapter 10. *Parallel wildland fire monitoring and tracking using heterogeneous resources*

Authors: David Valencia and Pablo Martinez, University of Extremadura.

III. LARGE-SCALE AND HETEROGENEOUS DISTRIBUTED COMPUTING:

Preface. *Introduction to Grid computing*

Authors: Samuel D. Gasster, Craig Lee and James Palko, The Aerospace Corporation.

Chapter 11. *Grid computing for remote sensing data and data analysis*

Authors: Samuel D. Gasster, Craig Lee and James Palko, The Aerospace Corporation.

Chapter 12. *High-performance computing for managing satellite image archives using Grid and cluster resources*

Author: Kenneth A. Hawick, Massey University.

Chapter 13. *Open Grid services for Envisat and Earth observation applications*

Author: Luigi Fusco, European Space Agency.

Chapter 14. *Design and implementation of a Grid computing environment for remote sensing*

Authors: Giovanni Aloisio, Massimo Cafaro, Italo Epicoco and Gianvito Quarta, University of Lecce.

Chapter 15. *An integrated process for hyperspectral image processing and analysis*

Authors: Miguel Vélez-Reyes, Wilson Rivera-Gallego, James Goodman, Shawn Hunt, Luis Jimenez and Nayda Santiago, University of Puerto Rico at Mayaguez

IV. SPECIALIZED ARCHITECTURES:

Chapter 16. *AVIRIS, a high-performance hyperspectral sensor for Earth and Space exploration*

Author: Robert O. Green, NASA Jet Propulsion Laboratory.

Chapter 17. *FPGA design for real-time implementation of hyperspectral image classification*

Authors: Jianwei Wang and Chein-I Chang, University of Maryland Baltimore County.

Chapter 18. *High-performance image processing with FPGA reconfigurable computing systems*

Author: Tarek El-Ghazawi, George Washington University.

Chapter 19. *Real-time online processing of hyperspectral imagery for target detection and discrimination*

Author: Qian Du, Mississippi State University.

Chapter 20. *Chemical and biological standoff detection using high-performance embedded systems*

Author: Hsuan Ren, National Central University.