

Preface

The remote sensing (RS) and geographic information system (GIS), 3D forest landscape modeling using airborne and space laser and radar scanning, digital photography, and global positioning satellite systems provide novel opportunities for remote sensing monitoring and inventory of forest resources. High efficiency of laser and radar scanning in combination with centimeter spatial resolution of digital aerial photography and high accuracy for coordinate definition of trees and tree stands' morphostructural parameters by satellite geopositioning systems allow to develop effective algorithms for research of forest resources structure and dynamics, guaranteeing a real-time automatic extraction of forest inventory parameters.

Computer modeling provides the building of 3D landscape scenes based on the data of laser and radar scanning and airborne images. The innovative methods of terrain and vegetation modeling are presented. Automatic fusion of data of different types is a non-solved problem requiring a development of future efficient methods. However, static modeling scenes will not be realistic if some natural effects are not imposed. The book is divided into four parts as follows:

Part I. Airborne LiDAR and Optical Measurements of Forest

Part II. Individual Tree Modelling

Part III. Landscape Scene Modelling

Part IV. Forest Eco-system Modelling

We are grateful to the researchers for inventing the tools and paradigms which laid the foundation for research and development reported in this book.

Our thanks are due to Springer-Verlag for the opportunity to publish our book.

This book is directed to the students, researchers, practitioners, and professors interested in remote sensing and geographic information systems and applications.

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