

# The Sage Handbook of Remote Sensing

The SAGE Handbook of Remote Sensing  
Advanced Remote Sensing  
Introductory Remote Sensing  
The Remote Sensing Sourcebook  
Textbook of Remote Sensing and Geographical Information Systems  
Comprehensive Remote Sensing  
Scale in Remote Sensing and GIS  
Practical Handbook of Remote Sensing  
Remote Sensing and GIS for Ecologists  
Introduction to the Physics and Techniques of Remote Sensing  
Physical Principles of Remote Sensing  
Remote Sensing Fundamentals of Remote Sensing  
Digital Analysis of Remotely Sensed Imagery  
Remote Sensing Fundamentals of Satellite Remote Sensing  
Basics of Remote Sensing and GIS  
Remote Sensing Digital Image Analysis  
Remote Sensing and Image Interpretation  
Principles of Remote Sensing  
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a magnificent achievement a who s who of contemporary remote sensing have produced an engaging wide ranging and scholarly review of the field

in just one volume professor paul curran vice chancellor bournemouth university remote sensing acquires and interprets small or large scale data about the earth from a distance using a wide range of spatial spectral temporal and radiometric scales remote sensing is a large and diverse field for which this handbook will be the key research reference organized in four key sections interactions of electromagnetic radiation with the terrestrial environment chapters on visible near ir and shortwave ir middle ir 3 5 micrometers thermal ir microwave digital sensors and image characteristics chapters on sensor technology coarse spatial resolution optical sensors medium spatial resolution optical sensors fine spatial resolution optical sensors video imaging and multispectral digital photography hyperspectral sensors radar and passive microwave sensors lidar remote sensing analysis design and implementation chapters on image pre processing ground data collection integration with gis quantitative models in remote sensing validation and accuracy assessment remote sensing analysis applications lithospheric sciences chapters on topography geology soils plant sciences vegetation agriculture hydrospheric and cryospheric sciences hydrosphere fresh and ocean water cryosphere global change and human environments earth systems human environments links to the social sciences real time monitoring systems and disaster management land cover change illustrated throughout an essential resource for the analysis of remotely sensed data the sage handbook of remote sensing provides researchers with a definitive statement of the core concepts and methodologies in the discipline

advanced remote sensing is an application based reference that provides a single source of mathematical concepts necessary for remote sensing data gathering and assimilation it presents state of the art techniques for estimating land surface variables from a variety of data types including optical sensors such as radar and lidar scientists in a number of different fields including geography geology atmospheric science environmental science planetary science and ecology will have access to critically important data extraction techniques and their virtually unlimited applications while rigorous enough for the most experienced of scientists the techniques are well designed and integrated making the book s content intuitive clearly presented and practical in its implementation comprehensive overview of various practical methods and algorithms detailed description of the principles and procedures of the

state of the art algorithms real world case studies open several chapters more than 500 full color figures and tables edited by top remote sensing experts with contributions from authors across the geosciences

introduction to remote sensing principles and concepts provides a comprehensive student introduction to both the theory and application of remote sensing this textbook introduces the field of remote sensing and traces its historical development and evolution presents detailed explanations of core remote sensing principles and concepts providing the theory required for a clear understanding of remotely sensed images describes important remote sensing platforms including landsat spot and noaa examines and illustrates many of the applications of remotely sensed images in various fields a unique world wide site accompanies this textbook developed for the users of netscape 3 internet explorer or above this site offers over 45 full colour images with descriptions examples illustrating remote sensing applications for meteorology geology vegetation studies urban studies and oceanography material from the americas the uk ireland africa australasia africa and western europe image exercises with answers shorter questions and answers on remote sensing an online glossary of terms links to sources of useful remote sensing information available online

remote sensing technology in india started in the 1960s space technology was developed during the 1970s and 1980s to use satellites and sensors in the areas of communication to exploit meteorological and ground resources like some other developing countries india could bypass the intermediate technology stage and leapfrog into the high technology area india s first satellite in irs series was irs 1a launched in march 1988 by a russian vostok launch vehicle our space technology has attained momentum and made tremendous achievements by launching the oceansat 1 for ocean resources monitoring resourcesat 1 for agricultural applications and cartosat 1 with a high resolution panchromatic camera for cartographic applications in india the remote sensing technology along with geographic information system gis is widely being used for more than two decades for inventorying mapping and monitoring of earth resources and for mitigation and management of natural disasters in days to come it will become the most powerful tool for management and distribution of information for various purposes this book is solely

written to meet the requirements of undergraduate courses in b e civil engineering b tech geoinformatics the postgraduate courses and m tech in remote sensing postgraduate diploma in remote sensing and gis and m e geoinformatics of various universities and institutions topics are covered with adequate tables and illustrations essential to an introductory text the book offers key concepts with the use of simple and limited mathematics digital image processing which forms the backbone of the book is dealt with special care the book explains fundamental basis of gis technology spatial data modeling attributes data management gis data analysis and modeling it will also serve as an ideal reference book for researchers in this field and practical users of this technology

comprehensive remote sensing nine volume set covers all aspects of the topic with each volume edited by well known scientists and contributed to by frontier researchers it is a comprehensive resource that will benefit both students and researchers who want to further their understanding in this discipline the field of remote sensing has quadrupled in size in the past two decades and increasingly draws in individuals working in a diverse set of disciplines ranging from geographers oceanographers and meteorologists to physicists and computer scientists researchers from a variety of backgrounds are now accessing remote sensing data creating an urgent need for a one stop reference work that can comprehensively document the development of remote sensing from the basic principles modeling and practical algorithms to various applications fully comprehensive coverage of this rapidly growing discipline giving readers a detailed overview of all aspects of remote sensing principles and applications contains layered content with each article beginning with the basics and then moving on to more complex concepts ideal for advanced undergraduates and academic researchers includes case studies that illustrate the practical application of remote sensing principles further enhancing understanding

the recent emergence and widespread use of remote sensing and geographic information systems gis has prompted new interest in scale as a key component of these and other geographic information technologies with a balanced mixture of concepts practical examples techniques and theory scale in remote sensing and gis is a guide for students and users of remote sensing and gis who must deal with the issues raised by multiple

temporal and spatial scales sixteen pages of full color photographs help demonstrate key points made in the text

the number of earth observation satellites launched in recent years is growing exponentially along with the datasets they gather from free to access and commercial providers the second edition of practical handbook of remote sensing is updated with new explanations and practical examples using the copernicus satellite data and new versions of the open source software a new chapter and new applications have also been added thoroughly revised the handbook continues to be a practical how to remote sensing guide for those who want to use the technology understand what is available how to access it and answer questions about our planet but do not necessarily want to become scientific experts

this is a book about how ecologists can integrate remote sensing and gis in their daily work it will allow ecologists to get started with the application of remote sensing and to understand its potential and limitations using practical examples the book covers all necessary steps from planning field campaigns to deriving ecologically relevant information through remote sensing and modelling of species distributions all practical examples in this book rely on opensource software and freely available data sets quantum gis qgis is introduced for basic gis data handling and in depth spatial analytics and statistics are conducted with the software packages r and grass readers will learn how to apply remote sensing within ecological research projects how to approach spatial data sampling and how to interpret remote sensing derived products the authors discuss a wide range of statistical analyses with regard to satellite data as well as specialised topics such as time series analysis extended scripts on how to create professional looking maps and graphics are also provided this book is a valuable resource for students and scientists in the fields of conservation and ecology interested in learning how to get started in applying remote sensing in ecological research and conservation planning

the science and engineering of remote sensing theory and applications the second edition of this authoritative book offers readers the essential science and engineering foundation needed to understand remote sensing and apply it in real world situations thoroughly updated to reflect the tremendous technological leaps made since the publication of

the first edition this book covers the gamut of knowledge and skills needed to work in this dynamic field including physics involved in wave matter interaction the building blocks for interpreting data techniques used to collect data remote sensing applications the authors have carefully structured and organized the book to introduce readers to the basics and then move on to more advanced applications following an introduction chapter 2 sets forth the basic properties of electromagnetic waves and their interactions with matter chapters 3 through 7 cover the use of remote sensing in solid surface studies including oceans each chapter covers one major part of the electromagnetic spectrum e g visible near infrared thermal infrared passive microwave and active microwave chapters 8 through 12 then cover remote sensing in the study of atmospheres and ionospheres each chapter first presents the basic interaction mechanism followed by techniques to acquire measure and study the information or waves emanating from the medium under investigation in most cases a specific advanced sensor is used for illustration the book is generously illustrated with fifty percent new figures numerous illustrations are reproduced in a separate section of color plates examples of data acquired from spaceborne sensors are included throughout finally a set of exercises along with a solutions manual is provided this book is based on an upper level undergraduate and first year graduate course taught by the authors at the california institute of technology because of the multidisciplinary nature of the field and its applications it is appropriate for students in electrical engineering applied physics geology planetary science astronomy and aeronautics it is also recommended for any engineer or scientist interested in working in this exciting field

revised and expanded second edition introduction to remote sensing for students and researchers

remote sensing is the use of electromagnetic sensors to monitor the earth s surface and atmosphere this technique can produce anything from topographic or geologic maps to two or three dimensional distributions of environmental parameters to the detection of developing hurricanes or floods these sensors produce digitized data so it is important that anyone working in remote sensing is familiar with the techniques used this updated second edition discusses a unified framework and rationale for designing and evaluating image processing algorithms

this book presents the fundamental concepts covering various stages of remote sensing from data collection to end utilization so that it can be appreciated irrespective of the discipline in which the reader has graduated the physical principles on which remote sensing are based has been explained without getting into complicated mathematical equations

an important text that identifies and introduces new trends in image analysis digital analysis of remotely sensed imagery provides thorough coverage of the entire process of analyzing remotely sensed data for the purpose of producing accurate representations in thematic map format written in easy to follow language with minimal technical jargon the book explores cutting edge techniques and trends in image analysis as well as the relationship between image processing and other recently emerged special technologies

remote sensing has undergone profound changes over the past two decades as gps gis and sensor advances have significantly expanded the user community and availability of images new tools such as automation cloud based services drones and artificial intelligence continue to expand and enhance the discipline along with comprehensive coverage and clarity sabins and ellis establish a solid foundation for the insightful use of remote sensing with an emphasis on principles and a focus on sensor technology and image acquisition the fourth edition presents a valuable discussion of the growing and permeating use of technologies such as drones and manned aircraft imaging dems and lidar the authors explain the scientific and societal impacts of remote sensing review digital image processing and gis provide case histories from areas around the globe and describe practical applications of remote sensing to the environment renewable and nonrenewable resources land use land cover natural hazards and climate change remote sensing digital database includes 27 examples of satellite and airborne imagery that can be used to jumpstart labs and class projects the database includes descriptions georeferenced images dems maps and metadata users can display process and interpret images with open source and commercial image processing and gis software flexible revealing and instructive the digital image processing lab manual provides 12 step by step exercises on the following topics an introduction to envi landsat multispectral processing image processing band ratios and principal components georeferencing dems and lidar ihs and image sharpening unsupervised

classification supervised classification hyperspectral and change detection and radar introductory and instructional videos describe and guide users on ways to access and utilize the remote sensing digital database and the digital image processing lab manual answer keys are available for instructors for questions in the text as well as the digital image processing lab manual

this third edition covers the most recent advances incorporated since the publication of the previous book relating to the acquisition and interpretation of remotely sensed data it includes updated eo missions such as the third generations of geostationary meteorological satellites the new polar orbiting platforms suomi the esa sentinels program and high resolution commercial systems low altitude sensing systems and improved coverage of digital techniques used to extract environmental information from remote sensing will be included as well particularly new machine learning classification techniques extended coverage of radar and lidar processing methods will also be included

remote sensing digital image analysis provides the non specialist with an introduction to quantitative evaluation of satellite and aircraft derived remotely retrieved data since the first edition of the book there have been significant developments in the algorithms used for the processing and analysis of remote sensing imagery nevertheless many of the fundamentals have substantially remained the same this new edition presents material that has retained value since those early days along with new techniques that can be incorporated into an operational framework for the analysis of remote sensing data the book is designed as a teaching text for the senior undergraduate and postgraduate student and as a fundamental treatment for those engaged in research using digital image processing in remote sensing the presentation level is for the mathematical non specialist since the very great number of operational users of remote sensing come from the earth sciences communities the text is pitched at a level commensurate with their background each chapter covers the pros and cons of digital remotely sensed data without detailed mathematical treatment of computer based algorithms but in a manner conductive to an understanding of their capabilities and limitations problems conclude each chapter

from recent developments in digital image processing to the next

generation of satellite systems this book provides a comprehensive introduction to the field of remote sensing and image interpretation this book is discipline neutral so readers in any field of study can gain a clear understanding of these systems and their virtually unlimited applications the authors underscore close interactions among the related areas of remote sensing gis gps digital image processing and environmental modeling appendices include material on sources of remote sensing data and information remote sensing periodicals online glossaries and online tutorials

remote sensing today electromagnetic radiation at the earth s surface aerial photography aerial sensor imagery satellite sensor imagery image processing sources of data remote sensing journals and symposia

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