1. Record Nr. UNINA9910555251403321 Autore Yang Xiaojun X. Titolo Urban remote sensing: monitoring, synthesis, and modelling in the urban environment / / Xiaojun X. Yang Pubbl/distr/stampa Hoboken, New Jersey:,: John Wiley & Sons, Inc.,, [2021] ©2021 **ISBN** 1-119-62587-4 1-119-62586-6 1-119-62585-8 9781119625858 9781119625872 9781119625841 Edizione [Second edition.] Descrizione fisica 1 online resource (531 pages) Disciplina 307.1216 Soggetti City planning - Remote sensing Spatial analysis (Statistics) Electronic books. Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Nota di bibliografia Includes bibliographical references and index. Nota di contenuto Cover -- Title Page -- Copyright Page -- Contents -- List of Contributors -- Authors Biography -- Preface -- Part I Introduction --Chapter 1 Progress in Urban Remote Sensing: An Overview -- 1.1 Introduction -- 1.2 Advances in Urban Remote Sensing -- 1.3 Overview of the Book -- 1.4 Summary and Concluding Remarks -- References --Part II Sensors and Systems for Urban Areas -- Chapter 2 Examining Urban Built-up Volume: Three-Dimensional Analyses with Lidar and Radar Data -- 2.1 Introduction -- 2.2 Three-Dimensional (3D) Geospatial Data for Urban Remote Sensing -- 2.3 Light Detection and Ranging (Lidar) Approaches -- 2.4 Radio Detection and Ranging (Radar) Approaches -- 2.5 A Look Forward -- 2.6 Conclusion --Acknowledgments -- References -- Chapter 3 Opportunities and Challenges of Unmanned Aircraft Systems for Urban Applications -- 3.1 Introduction -- 3.2 Common UAS Models and Sensors -- 3.3 Data

Collection and Processing -- 3.4 UAS for Urban Applications -- 3.5

Major Challenges and Possible Solutions -- 3.7 Summary and Outlook -- References -- Chapter 4 Methods of Social Sensing for Urban Studies -- 4.1 Introduction -- 4.2 Sensing First-Order Place Characteristics -- 4.3 Sensing Second-Order Spatial Dependency and Interactions -- 4.4 Integrating Place Characteristics with Spatial Interactions -- 4.5 Conclusions -- References -- Chapter 5 Urban Remote Sensing Using Ground-Based Street View Images -- 5.1 Introduction -- 5.2 Literature Review -- 5.3 Data Sources of Street-Level Images -- 5.4 Street-Level Image Processing -- 5.5 Urban Mapping and Modeling -- 5.6 Discussion and Future Research Directions -- References -- Chapter 6 Spatial Distribution of City Tweets and Their Densities -- 6.1 Introduction -- 6.2 Natural Cities, Street Blocks, and Related Distances. 6.3 Data and Data Processing -- 6.4 Two Major Findings -- 6.5 Implications of the Study and Its Findings -- 6.6 Conclusions --Acknowledgments -- References -- Chapter 7 Integrating Remote Sensing and Social Sensing to Examine Socioeconomic Dynamics: A Case Study of Twitter and Nighttime Light Imagery -- 7.1 Introduction -- 7.2 Remote Sensing and Social Sensing -- 7.3 People and Pixels 2.0: Toward an Integration of Remote Sensing and Social Sensing -- 7.4 Discussion and Conclusions -- References -- Part III Algorithms and Techniques for Urban Attribute Extraction -- Chapter 8 Deep Learning for Urban and Landscape Mapping from Remotely Sensed Imagery -- 8.1 Introduction -- 8.2 An Overview of Some Commonly Used Deep Learning Models -- 8.3 Case Study I: A Patch-based CNNs Model for Land Cover Classification -- 8.4 Case Study II: A Patch-based RNNs Model for Land Classification -- 8.5 Discussion and Conclusions -- Acknowledgments -- References -- Chapter 9 Google Earth Engine Advancing Urban Land Change Science -- 9.1 Introduction -- 9.2 GEE Evolution in Urban Studies -- 9.3 Examples -- 9.4 Discussion -- 9.5 Conclusions -- References -- Chapter 10 Use of Image Endmember Libraries for Multi-Sensor, Multi-Scale, and Multi-Site Mapping of Urban Areas -- 10.1 Introduction -- 10.2 Image Endmember Libraries for Urban Mapping -- 10.3 Extraction and Identification of Image Endmember Spectra -- 10.4 Pruning of Image Endmember Libraries -- 10.5 Use of Image Endmember Libraries for Mediumresolution Mapping of Urban Land Cover Composition -- 10.6 Use of Multi-Site Spectral Libraries for VIS Mapping Across Cities -- 10.7 Toward a Generic Urban Library Management Tool --Acknowledgments -- References -- Chapter 11 Satellite Monitoring of Urbanization and Environmental Impacts in Stockholm, Sweden. Through a Multiscale Approach -- 11.1 Introduction. 11.2 A Brief Review of Remote Sensing-Based Multiscale Analysis --11.3 Study Areas and Data Description -- 11.4 Methodology -- 11.5 Results -- 11.6 Discussion -- 11.7 Conclusions -- References -- Part IV Urban Socioeconomic Applications -- Chapter 12 Global Monitoring with the Atlas of Urban Expansion -- 12.1 Introduction -- 12.2 Assembling the Global Sample of Cities -- 12.3 Measuring Urban Extent -- 12.4 Urban Extent Growth Rate, Population Growth Rate, and the Change in Land Consumption Per Capita -- 12.5 Assessing Accuracy with Urban Extent Locales -- 12.6 Classification Accuracy and Map Agreement -- 12.7 Conclusions -- Acknowledgments --References -- Chapter 13 Effect of Image Classification Accuracy on Dasymetric Population Estimation -- 13.1 Introduction -- 13.2 Assessing the Accuracy of Image Classification -- 13.3 Dasymetric Mapping and Areal Interpolation -- 13.4 Study Area and Data Sources -- 13.5 Methods -- 13.6 Results -- 13.7 Conclusions --

Case Study: Mapping an Urban Recreation Complex with UAS -- 3.6

Acknowledgments -- References -- Chapter 14 Mapping the Morphology of Urban Deprivation: The Role of Remote Sensing for Developing a Global Slum Repository -- 14.1 Background -- 14.2 Deprivation: An Area-Based and Relative Concept -- 14.3 Data Sources: Overview of EO-Data in Relation to Their Benefits and Costs -- 14.4 Toward a Global Mapping Product: People-Pixels-Privacy -- 14.5 Mapping Methods: Achieving Scalability and Transferability -- 14.6 Examples of Mapping Urban Deprivation -- 14.7 Conclusions -- Acknowledgments -- References -- Chapter 15 The City is the Medium and Satellite Imagery Are a Prism: Conceptualizing Urban Conflict Damage Monitoring with Multitemporal Remote Sensing Data -- 15.1 Introduction -- 15.2 Opportunities for Satellite-based Monitoring of Urban Conflict Damage -- 15.4 Theorizing Change in Urban Conflict Damage

Monitoring. 15.5 Conclusions -- References -- Part V Urban Environmental Applications -- Chapter 16 US Cities in the Dark: Mapping Man-Made Carbon Dioxide Emissions Over the Contiguous US Using NASA's Black Marble Nighttime Lights Product -- 16.1 Introduction -- 16.2 NASA Black Marble Data -- 16.3 CO2 Emission Modeling -- 16.4 Results --16.5 Examining Black Marble NTL Data as Estimator of CO2 Emissions -- 16.6 New Advantages in NTL-Based Mapping, Challenges, and Future Perspectives -- 16.7 Conclusions -- Acknowledgments --References -- Chapter 17 Thermal Infrared Imaging of the Urban Landscape to Understand Urban Microclimate -- 17.1 Introduction --17.2 Methodology -- 17.3 Study Site and Data -- 17.4 Results -- 17.5 Discussion and Conclusions -- Acknowledgments -- References --Chapter 18 Monitoring Air Pollution in the Urban Environment by Remote Sensing -- 18.1 Air Pollution Monitoring Problem: The Complexity -- 18.2 Satellite Retrieved AOD vs Ground-Based PM2. 5 Measurements: Basic Definitions -- 18.3 Applying Different Satellite AOD Retrievals Over the Urban Environment: Data Coverage and Spatial Resolution -- 18.4 Satellite-Retrieved AOD Compared to Ground-Based and Other Measurements Available -- 18.5 Modeling PM2.5 Using Satellite and Land Use Data -- 18.6 Model Accuracy Assessment --18.7 Learning Air Pollution from Publicly Available Sources: Several Examples -- 18.8 Current and Future Steps and New Technologies: Beyond the Satellite Monitoring -- References -- Chapter 19 Characterizing After-Rain Standing Waters in Urban Built Environments Through a Multilevel Image Analysis -- 19.1 Introduction -- 19.2 Materials and Methods -- 19.3 Results -- 19.4 Discussion -- 19.5 Conclusions -- Acknowledgments -- References -- Chapter 20 Remote Sensing and Urban Green Infrastructure: A Synthesis of Current Applications and New Advances -- 20.1 Introduction. 20.2 Current Applications -- 20.3 Recent Advances -- 20.4 Conclusions -- References -- Chapter 21 Remote Sensing for Urban Sustainability Research and Sustainable Development Goals: Green Space, Public Recreation Space, and Urban Climate -- 21.1 Introduction -- 21.2 Remote Sensing and Earth Observation -- 21.3 Remote Sensing for SDGs -- 21.4 An Analysis of the Scientific Literature in the Field of Sustainability -- 21.5 Discussion -- 21.6 Summary and Conclusions -- References -- Index -- EULA.

Sommario/riassunto

"PREFACE The first edition of Urban Remote Sensing: Monitoring, Synthesis and Modeling in the Urban Environment published in 2011was primarily an outcome of my decade-long efforts promoting urban remote sensing research through organizing thematic paper sessions at the annual meetings of American Association of Geographers (AAG). It is the first book written with a broad vision of

urban remote sensing that draws upon multiple disciplines and the integration of remote sensing with relevant geospatial data and technologies. The book covered a variety of topics extending beyond urban feature extraction and into socioeconomic and environmental analyses and predictive modeling of urbanization. It contrasts considerably in such a treatment with other dedicated books on urban remote sensing, which are largely restricted on urban feature extraction and land use interpretation. In addition, the book has been translated into Chinese and was published by China's Higher Education Press in 2014"--