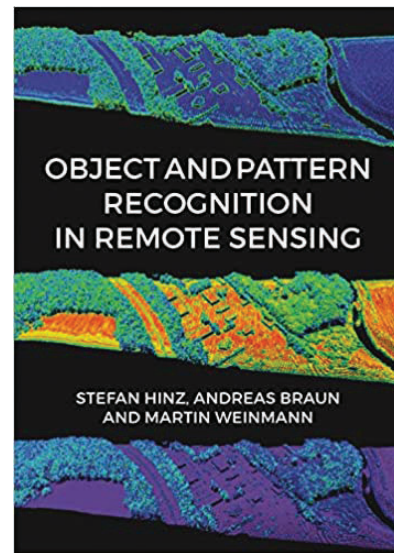


Many geospatial luminaries have emerged from the academic apparatus in Karlsruhe. Of the 16 contributors to *Object and Pattern Recognition in Remote Sensing* book, all but Franz Rottensteiner are educated and/or work at Karlsruhe Institute of Technology (KIT). They provide a condensed, masterly review of a considerable body of material representing many strands of remote sensing research. The subtitle is *Modelling and Monitoring Environmental [sic] and Anthropogenic Objects and Change Processes*.

Stefan Hinz, head of KIT's Institute for Photogrammetry and Remote Sensing (IPF), is well known and is president of ISPRS Technical Commission I (Sensor Systems). It's appropriate, therefore, that a foreword has been contributed by ISPRS president Christian Heipke, giving perspective, in terms of both remote sensing and photogrammetry and also the eminence of KIT.

The book is in three parts. The first, "Methodology," begins with an introduction by Hinz, setting the stage. He proceeds with Chapter 2, "Object Data and Sensor Modelling" a readable synthesis of vast amounts of material, and includes a large number of references at the end of the chapter - this happens with every chapter and immeasurably increases the book's value. This excellent review material continues with Chapter 3, by Martin Weinmann, "Feature Extraction from Images and Point Clouds: Fundamentals, Advances and Trends." Andreas Braun joins Weinmann for Chapter 4, "A Short Survey on Supervised Classification in Remote Sensing." Rottensteiner takes the helm for Chapter 5, "Context-based Classification" and Uwe Weidner completes the section with Chapter 6, "Toward a Framework for Quality Assessment in Remote Sensing Applications." These syntheses, complemented by the ample references, are invaluable and justify buying the book - yet little of the work cited dates from later than 2010.

Part II, "Applications," summarizes research done in Karlsruhe. Chapter 7, "From Raw 3D Point Clouds to Semantic Objects" (Weinmann, Sven Wursthorn, Boris Jutzi), focuses on terrestrial laser scanning and range cameras. The coverage of point cloud matching and registration is very useful, as is the material on feature extraction and scene interpretation. The references again are not new, however, and the datasets were last accessed in 2013. Hinz returns to the stage, with Jens Leitloff, with Chapter 8, "Traffic Extraction and Characterization from Optical Remote Sensing Data," full of well explained, interesting work based on still images rather than video. The tell-tale is a footnote, "Updated and revised version of (Hinz et al. 2008)": the material is mature and the update refers mainly to work published 2009-14. Chapter 9, "Object Extraction in Image Sequences" by Florian Schmidt and



Object and Pattern Recognition in Remote Sensing

Edited by Stefan Hinz, Andreas Braun and Martin Weinmann.

Whittles Publishing, Dunbeath, Caithness, UK. 2021. xiii and 350 pp, 88 color and 37 black and white illustrations, 18 tables, index. Hardcover. ISBN 978-1-84995-128-9. \$183.96. £90.00; Amazon \$107.73.

Reviewed by Stewart Walker, sole proprietor, photogrammetry4u, San Diego, California.

Hinz, summarizes strong work on the detection of persons from aerial photography with a frequency of 2 Hz, though this is hardly representative of fast-cycling modern cameras or the role of UAVs. Yet, like much of the material in this book, the cohesive, lucid presentation, drawing on extensive literature, provides understanding and background. Chapter 10, "A Process-based Model Approach to Predict Future Land-Use Changes and Link Biodiversity with Soil Erosion in Chile," by Andreas Braun and Callum Banfield, is based on the first author's PhD thesis and the second author's MS thesis, both at KIT in 2013. This shorter chapter is practical and gives a useful account of the challenges and solutions within a particular research theme.

The book then change sensors. Chapter 11, "Interferometric

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and Remote Sensing
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SAR Image Analysis for 3D Building Reconstruction,” by Antje Thiele, Clémence Dubois and Hinz, takes up from Hinz’s initial comments on SAR in Chapter 2 and quickly dives deep with descriptions of how buildings can be extracted from the data. Chapter 12, “Detection and Classification of Collapsed Buildings after a Strong Earthquake by Means of Laser Scanning and Image Analysis,” by Miriam Hommel and Thomas Vögtle probes the practicalities of assessing damage from point clouds and imagery. This is a fascinating read and one is conscious of the human tragedies behind the science. Ulrike Sturm-Hentschel, Braun and Hinz end the section with Chapter 13, “A Settlement Process Analysis in Coastal Benin: Confronting Scarce Data Availability in Developing Countries,” reporting high-quality research work, using, for example, QuickBird data. The authors’ complaints about lack of data, however, are less worrisome in 2021, since the constellations of multiple satellite operators provide a plethora of information with shorter and shorter repeat times.

The book is drawn together in Part III, “Conclusion.” This material is more up to date than Part II. Chapter 14, “Benchmarking: a basic requirement for effective performance evaluation,” by Weinmann and Braun, stresses the importance of standard data sets for assessing new approaches and gives several examples. Seven authors worked on Chapter 15, “Remote sensing and computer vision image analysis: summary and recent trends.” This title confirms that the emphasis is less on photogrammetry than some readers would perhaps prefer. Sometimes whimsical, with glimpses of humor, this chapter weaves the book’s threads into fabric. It levers the book into the second half of the 2010s and is a perceptive assessment of trends. The

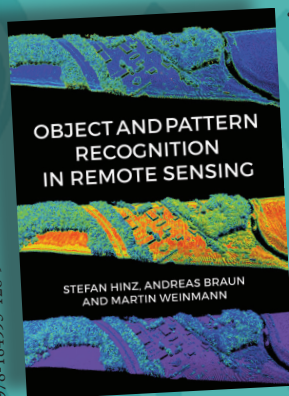
authors’ experiences and involvements shine through and there is acuity as well as description.

Your reviewer’s unease with the currency of the material, nevertheless, resurfaced in the final chapter. There is excellent but brief coverage of deep learning, for example, which gave your reviewer more insight than many of the heavy papers on the subject with which he has grappled. Yet between this (pages 338-339) and the comments on page vii in Heipke’s foreword and pages 6-7 in Hinz’s introduction, the topic is barely mentioned. How I wish there had been much more on this topic! There is an insight on page 339 that the authors “finalized the book in 2018/19,” which suggests that the final steps to publication were lengthy ones. There is a remark on page 336 about “recent reviews” of multiple classifier systems that were published in 2002 and 2007.

Object and Pattern Recognition in Remote Sensing is a fine, well produced book, a real pleasure to use. The Scottish firm, Whittles Publishing, has incorporated both monochrome and color graphics that are attractive, though sometimes on the small side (the legend of figure 10.3 has a 3-point font!). There are few typos, though tighter editing would have eliminated some minor curiosities in language. Though rather advanced for students new to remote sensing, it will certainly serve the lecturers, practitioners, researchers, advanced undergraduates, and postgraduates that the publisher’s blurb on the back cover suggests are the target market. While the absence of material on the last ten years, particularly in Part II, must remain a demerit until the second edition, the excellence of Parts I and III should convince doubters to purchase this book.

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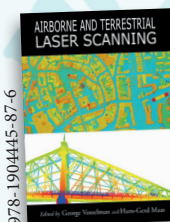
GEOMATICS NEWS FROM WHITTLES PUBLISHING



‘...an excellent overview of the current state-of-the-art in photogrammetry and remote sensing. ... of high relevance to students and other people wanting to learn about photogrammetry and remote sensing. ... I congratulate the authors...’ Extract from Foreword by Professor Christian Heipke, ISPRS President 2016–2020. *Institut für Photogrammetrie und GeoInformation (IPI), Leibniz Universität Hannover*

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