## PROCEEDINGS OF SPIE

## Remote Sensing Technologies and Applications in Urban Environments III

Thilo Erbertseder Nektarios Chrysoulakis Ying Zhang Editors

10–12 September 2018 Berlin, Germany

Sponsored by SPIE

Cooperating Organisations
European Optical Society
European Association of Remote Sensing Companies (Belgium)
CENSIS—Innovation Centre for Sensor and Imaging Systems (United Kingdom)
ISPRS—International Society for Photogrammetry and Remote Sensing
EARSeL—European Association of Remote Sensing Laboratories (Germany)
Remote Sensing & Photogrammetry Society (United Kingdom)

Published by SPIE

**Volume 10793** 

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:

Author(s), "Title of Paper," in Remote Sensing Technologies and Applications in Urban Environments III, edited by Thilo Erbertseder, Nektarios Chrysoulakis, Ying Zhang, Proceedings of SPIE Vol. 10793 (SPIE, Bellingham, WA, 2018) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510621695

ISBN: 9781510621701 (electronic)

Published by

SPIF

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time)· Fax +1 360 647 1445

Copyright © 2018, Society of Photo-Optical Instrumentation Engineers.

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/18/\$18.00.

Printed in the United States of America 'Vm7 i ffUb '5 ggc WJUh' gž +b Wži b XYf 'JW bgY 'Zfca 'GD-9.

Publication of record for individual papers is online in the SPIE Digital Library.



**Paper Numbering:** Proceedings of SPIE follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

## Contents

vii ix	Authors Conference Committee
	URBAN AIR QUALITY AND CLIMATE I
10793 04	A photopollution index based on weighted cumulative visibility to night lights [10793-3]
10793 06	Measurement of trace gas emissions using Mobile-DOAS and UV-cameras at Montevideo Harbour [10793-5]
	URBAN CLIMATE AND PLANNING I
10793 07	Assessment of monthly variations of urban heat island in Delhi using Landsat 8 dataset [10793-14]
	URBAN AIR QUALITY AND CLIMATE II
10793 09	Estimation of urban air temperature spatial patterns based on sensors network observations and satellite derived predictors (Invited Paper) [10793-6]
10793 0A	Seasonal variation in spectral global and direct solar irradiances over a megacity Delhi [10793-7]
10793 OB	Application of thermal infrared band for landcover/landuse and temperature study as an indicator urban climate change in Yogyakarta [10793-8]
	SMART AND SUSTAINABLE CITIES
10793 OE	Effectiveness of RGB imagery from diverse sources for real-time urban flood water mapping (Invited Paper) [10793-17]
10793 OF	Sterling: a framework for serious games to encourage recycling [10793-18]
10793 OI	Comparison of satellite remote sensing data in the retrieve of PM10 air pollutant over Quito, Ecuador [10793-21]

	URBAN PLANNING
10793 OK	Investigating the suitability of Sentinel-2 data to derive the urban vegetation structure [10793-23]
	MAPPING OF THE BUILT ENVIRONMENT I
10793 0M	Electric pole detection using deep network based object detector [10793-26]
10793 ON	Remote sensing archaeology knowledge transfer: examples from the ATHENA twinning project [10793-27]
10793 00	X-band persistent SAR interferometry for surface subsidence detection in Rudrapur City, India [10793-28]
	MAPPING OF THE BUILT ENVIRONMENT II
10793 OR	Fire detection in informal settlements [10793-31]
10793 OS	Analysis of urban expansion and the driving forces in eastern coastal region of China [10793-34]
10793 OT	An object-based image analysis approach for determining the pattern of urban growth in the first planned city of India [10793-35]
	POSTER SESSION
10793 OY	Remote sensing analysis of impervious surface changes in Luoyang City during 1990—2016 [10793-38]
10793 OZ	Climate effects of aerosols in Bucharest metropolitan area [10793-39]
10793 10	Spatiotemporal urban growth impact on Bucharest metropolitan region climate [10793-40]
10793 13	Utilizing open source GIS for sustainable urban development [10793-43]
10793 14	Comparison of NDVI, NDBI as indicators of surface heat island effects for Bangalore and New Delhi: case study [10793-44]

10793 15	Data fusion for high accuracy classification of urban areas [10793-45]
10793 18	The automated space-monitoring system of waste disposal sites [10793-48]
10793 1C	Context-redefined language synthesis for energy consumption prediction using data from mixed remote sensors types [10793-52]