

PROCEEDINGS OF SPIE

Remote Sensing Technologies and Applications in Urban Environments X

**Thilo Erbertseder
Nektarios Chrysoulakis
Ying Zhang**
Editors

**17–18 September 2025
Madrid, Spain**

Sponsored by
SPIE

General Sponsors
FiberBridge Photonics (Germany)
Iberoptics Sistemas Ópticos (Spain)

Published by
SPIE

Volume 13672

Proceedings of SPIE 0277-786X, V. 13672

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

Remote Sensing Technologies and Applications in Urban Environments X, edited by Thilo Erbertseder, Nektarios Chrysoulakis, Ying Zhang, Proc. of SPIE Vol. 13672, 1367201
2025 Published by SPIE · 0277-786X · doi: 10.1117/12.3093811

Proc. of SPIE Vol. 13672 1367201-1

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 SPIDigitalLibrary.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 X*, edited by Thilo Erbertseder, Nektarios Chrysoulakis, Ying Zhang, Proc. of SPIE 13672, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X
ISSN: 1996-756X (electronic)

ISBN: 9781510692831
ISBN: 9781510692848 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2025 Society of Photo-Optical Instrumentation Engineers (SPIE).

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 fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center 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.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

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

SPIE. DIGITAL LIBRARY
SPIDigitalLibrary.org

Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE 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

v *Conference Committee*

URBAN CLIMATE

- 13672 03 **RPAS thermography of large-scale district heating systems at Canadian forces bases to quantify heat energy loss and estimated equivalent CO₂ production** [13672-2]
- 13672 04 **Quantifying methane point-source emissions with hyper-spectral imagery and the deep learning model** [13672-3]
- 13672 05 **MFB-YOLO: a high-precision algorithm for moving fluid boundary gas cloud detection** [13672-4]

URBAN PLANNING AND FLOOD RISK MANAGEMENT

- 13672 07 **Assess the effect of heavy rainfall through the integration of remote sensing and in situ measurements** [13672-7]

URBAN AIR QUALITY AND HEALTH

- 13672 0A **Temperature-dependent health risks from short-term ozone exposure: spatial variation across urbanisation levels** [13672-10]
- 13672 0C **Leak gas detection technique with hyperspectral Raman imaging Lidar** [13672-12]
- 13672 0D **Combined use of AERONET and MAX-DOAS observations in Montevideo for the detection of biomass burning products** [13672-13]

SMART CITIES

- 13672 0E **Window extraction from aerial photogrammetry point cloud datasets for the development of energy digital twins (EDTs)** [13672-16]
- 13672 0F **Are we there yet: an assessment of the actual state-of-the-art of satellite hyperspectral remote sensing for urban applications** [13672-14]

POSTER SESSION

- 13672 0I **Wildfire assessment using remotely sensed data over Mpumalanga, South Africa** [13672-19]
- 13672 0J **Secure architecture for IoT and blockchain-based waste traceability** [13672-20]
- 13672 0K **Monitoring of electromagnetic radiation in a highly urbanized environment** [13672-21]
- 13672 0L **A multimodal Lidar system for auditory spatial awareness of visually impaired individuals in urban environment** [13672-23]
- 13672 0M **Mobile sensor system for dynamic mapping of air quality in urban environment** [13672-24]
- 13672 0N **Estimation of water particle distribution by LED mini-Lidar** [13672-25]
- 13672 0O **Monitoring of renewable energy sources in the area of Ihtiman municipality, Bulgaria** [13672-26]

Conference Committee

Symposium Chair

Claudia Notarnicola, Eurac Research (Italy)

Symposium Co-chair

Thilo Erbertseder, Deutsches Zentrum für Luft- und Raumfahrt e.V.
(Germany)

Conference Chairs

Thilo Erbertseder, Deutsches Zentrum für Luft- und Raumfahrt e.V.
(Germany)

Nektarios Chrysoulakis, Foundation for Research and Technology-
Hellas (Greece)

Ying Zhang, Natural Resources Canada (Canada)

Conference Program Committee

Costas Armenakis, York University (Canada)

Ingunn Burud, Norwegian University of Life Sciences (Norway)

Thomas Esch, Deutsches Zentrum für Luft- und Raumfahrt e.V.
(Germany)

Lorenza Gilardi, Deutsches Zentrum für Luft- und Raumfahrt e.V.
(Germany)

Sheila Izquieta Rojano, University de Navarra (Spain)

Monika Kuffer, University Twente (Netherlands)

Giannis Lantzanakis, Foundation for Research and Technology-Hellas
(Greece)

Zina Mitraka, Foundation for Research and Technology-Hellas
(Greece)

William Morrison, University of Freiburg (Germany)

Tobias Reinicke, Satellite vu (United Kingdom)

Dimitris Tsirantonakis, Foundation for Research and Technology-Hellas
(Greece)

