Foreword to the Special Issue on Human Settlement Observation and Monitoring from Space

THE FOURTH Joint Urban Remote Sensing Event (JURSE 2013), which jointly congregated the Seventh GRSS/ISPRS Joint Workshop on "Remote sensing and data fusion over urban areas (URBAN)" and the Ninth International Symposium on "Remote sensing of urban areas (URS)," was held April 21−23 at the Maksoud Plaza Hotel Convention Centre in São Paulo, Brazil. This biannual international event was for the first time held in South America, revealing the worldwide reach of this scientific field, dedicated to explore cutting-edge themes in urban remote sensing with respect to Information Technology and Geosciences. JURSE 2013 acted as a forum of excellence where a selected group of researchers, practitioners, officers from national and international agencies, and academicians presented and discussed their latest findings and results.

This meeting attracted over 100 participants from the European, Asian, North and South American, and Australian continents and its technical programme comprised oral and poster presentations, two keynote talks and three plenary talks. It successfully introduced innovative methodologies and technological resources recently employed to investigate the manifold aspects of the urban environment through orbital and airborne remote sensing data.

With the theme of *Human Settlement Observation and Monitoring from Space*, the IEEE JOURNAL OF SELECTED TOPICS IN APPLIED EARTH OBSERVATIONS AND REMOTE SENSING (JSTARS) created this special issue dedicated to offer the attendees of JURSE 2013 an excellent opportunity to publish refined versions of papers originally presented in such event.

The papers herein included can be divided into four thematic groups: 1) innovations in feature extraction and classification of urban areas; 2) advanced techniques for urban 3-D modeling; 3) new methods for assessing energy fluxes and land surface temperature (LST) in urban environments; and 4) carbon stocks analysis in peri-urban areas.

The first group comprises most of this special issue papers (14) and their topics cover a wide range of sensors and approaches, including works related to urban land cover classification with hyperspectral data, OBIA classification relying on LiDAR data, a two-phase classification of urban vegetation combining LiDAR data and aerial photography, building extraction with integrated decomposition of time-frequency using polarimetric SAR data and building extraction with VHR data using the percentage occupancy hit-or-miss transform, automatic object-based evaluation system for building extraction techniques, building damage evaluation with the aid of VHR images, built-up areas detection with a fuzzy texture measure, assessment of fine-resolution urban extents from coarser resolution maps, methods for detecting urban expansion and estimating urban density based on night-time satellite imagery, urban change detection based on L-band polarimetric descriptors and on the MAP-MRF classifier applied to SAR data, and finally, a multiscale approach for water body extraction in urban environments.

The second group of eight papers gathers works associated with the use of digital surface models (DSMs) for elevation change detection and calculation of urban morphology landscape indices, reconstruction of urban 3-D buildings by a multiscale grid method and by an automated segmentation of point clouds, assessment of areal and vertical accuracies of 3-D building models derived from optical stereo-pairs and LiDAR data, segmentation of InSAR persistent scatterer point clouds to describe separate façades, and the use of multiaspect multibaseline InSAR data and fully polarimetric multibaseline InSAR tomography for the reconstruction of urban surface models.

Three papers form the third group. Two of them were dedicated to retrieve multitemporal LST data, one of them using thermal images of Landsat 5 and 7, and the other one counting on a visible infra-red imager sensor from a geostationary meteorological satellite. A third paper from this group combines meteorological measures and remote sensing data from ASTER sensor to estimate energy fluxes.

Finally, one single paper lies within the fourth group, whose major research field concerns global climate changes. This work reports an experiment designed to investigate the effectiveness of mid-resolution remote sensing products for estimating carbon stocks in sparsely urbanised areas.

We would like to thank the JURSE 2013 team and acknowledge the General Chairs and the Local Organizing Team for their enthusiasm, support, and hard work in making the São Paulo meeting both a productive and rewarding experience.

The 26 papers accepted for this special issue result from a pool of over 60 original submissions. We would like to acknowledge the contributions of those colleagues who participated in the careful review process, and particular thanks go to Prof. J. Chanussot (J-STARS Editor-in-Chief) for his dedication and sound judgment in heading this special issue.

We truly expect that the reading of these papers from JURSE 2013 can be an important reference for those committed with the continuous advancement of urban remote sensing, and may remind attendees of the enjoyable time at the São Paulo event.

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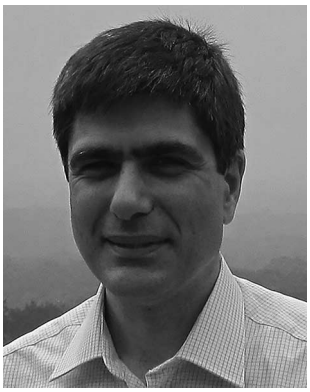
She was a Ph.D. Affiliate Researcher with the Centre for Advanced Spatial Analysis, University College London, London, U.K., between 2001 and 2002, and accomplished a postdoc programme in spatial dynamic modeling at INPE in 2004. She is currently a Senior Researcher with INPE, where she coordinates the Group for Urban Studies, and was a Visiting Professor with the Federal University of Santa Maria (UFSM) and with the São Paulo State University (UNESP). She is the current INPE's Coordinator of the Brazilian Network for Advanced Computer Vision (RVA) from the Federal Ministry for Science and Technology, targeted to technological research and innovation, and serves as an Associate Editor for the *Brazilian Journal of Cartography* (RBC). Her research interests include geoinformation science, focusing on remote sensing, mainly urban remote sensing, cellular automata, urban modeling, spatial analysis, high spatial resolution sensors, and object-based image analysis.



Paolo Gamba (SM'00–F'13) received the Laurea degree (*cum laude*) in electronic engineering from the University of Pavia, Pavia, Italy, in 1989, and the Ph.D. degree in electronic engineering from the same university in 1993.

He is an Associate Professor of Telecommunications with the University of Pavia, Pavia, Italy, where he also leads the Telecommunications and Remote Sensing Laboratory. He has been invited to give keynote lectures and tutorials in several occasions about urban remote sensing, data fusion, EO data, and risk management. He has authored more than 100 papers in international peer-review journals and presented more than 250 research works in workshops and conferences.

Dr. Gamba served as the Editor-in-Chief of the IEEE GEOSCIENCE AND REMOTE SENSING LETTERS from 2009 to 2013, and as Chair of the Data Fusion Committee of the IEEE Geoscience and Remote Sensing Society from October 2005 to May 2009. Currently, he is the Chair of the Chapters' Committee of the same society. He has been the Organizer and Technical Chair of the biennial GRSS/ISPRS Joint Workshops on "Remote Sensing and Data Fusion over Urban Areas" since 2001. The latest edition, JURSE 2015, will be held in Lausanne (Switzerland) in April 2015. He also served as Technical Co-Chair of the 2010 IEEE Geoscience and Remote Sensing Symposium, Honolulu, HI, July 2010, and will serve as Technical Co-Chair of the 2015 IEEE Geoscience and Remote Sensing Symposium, Milan, Italy. He has been the Guest Editor of special issues of the IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING, the IEEE JOURNAL OF SELECTED TOPICS IN REMOTE SENSING APPLICATIONS, ISPRS *Journal of Photogrammetry and Remote Sensing*, *International Journal of Information Fusion and Pattern Recognition Letters on the Topics of Urban Remote Sensing*, *Remote Sensing for Disaster Management*, *Pattern Recognition in Remote Sensing Applications*.

Carsten Juergens was born in 1961, graduated with a Diploma degree in geography from Trier University, Trier, Germany, in 1989, received the Ph.D. degree from the same university in 1992, and then moved to the University of Regensburg, Regensburg, Germany, for an Assistant Professorship. In 1999, he finished his Habilitation.

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Dr. Juergens was the Guest Editor of four Special Issues of the *International Journal of Remote Sensing* and the IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING.

Derya Maktav was born in 1951, graduated with the B.Sc. degree in geomatics engineering from Istanbul Technical University (ITU), Istanbul, Turkey, in 1975. In 1976, he was awarded a Certificate in photogrammetry from the University College London (UCL), London, U.K. He received the M.Sc. degree in civil engineering and surveying from Karlsruhe Technical University, Karlsruhe, Germany, in 1979, and the Ph.D. degree in geomatics engineering from ITU in 1985. He gained a Certificate on "Digital Analysis of Thematic Mapper Data" from the Laboratory for Applications of Remote Sensing (LARS), Purdue University, West Lafayette, IN, USA, in 1985.

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Dr. Maktav was elected as a Council Member of the EARSeL in 2007. He has served as a Member of the New York Academy of Sciences, EARSeL, Turkish National Association of Remote Sensing and Photogrammetry (TUFUAB), Turkish Chamber of Mapping and Cadastre (TMMOB-HKMO), and the German Association for Photogrammetry and Remote Sensing (DGPF). He was the Guest Editor for four Special Issues of the *International Journal of Remote Sensing* and the IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING. He was the recipient of the Henry Ford European Conservation Awards 1998, National Award with the "International Mediterranean Project" by the Council of Europe, World Heritage and Ford.