Foreword to the Special Issue on Advances in SAR and Radar Technology

This Special Issue presents 25 papers to exhibit the latest advances in SAR and radar technology. It basically follows the Asia-Pacific Conference on Synthetic Aperture Radar (APSAR) 2013, an International Conference devoted to SAR and radar technology, held in Tsukuba, Japan, on September 23–27, 2013 [1]. There 163 papers were presented to over 240 attendees with worldwide 17 exhibiting companies. It was a very exciting activity [2] held by IEEE GRSS All Japan Chapter [3] and the Institute of Electronics, Information, and Communication Engineers (IEICE) Electronics Society.

APSAR covers a wide variety of SAR and radar related topics including SAR applications, analysis techniques, signal processing, and SAR system design and concepts. In APSAR 2013, “Disaster Monitoring” was the main theme, providing the attendees with an opportunity to think about how each of us can contribute through SAR technology to overcome the hardships after disasters.

To further promote research activities in this and relevant areas, IEEE JSTARS planned to publish this Special Issue on Advances in SAR and Radar Technology. The scope of this Special Issue is then identical with that of APSAR 2013 Tsukuba, which ranged over the six topical fields, namely:

A. Disaster Monitoring: Contribution of SAR remote sensing on the Great East Japan Earthquake, ALOS2 projects for prediction, mitigation, and restoration, SAR applications for various disasters, and present and future SAR systems and missions in Asia-Pacific region;
B. SAR Applications: Land use and land cover, soil and vegetation applications, atmosphere and ocean observation, snow and ice, and coastal and wetlands;
C. Analysis Techniques: Electromagnetic modeling, InSAR and high-resolution SAR, POL and POLInSAR, and Bistatic SAR;
D. SAR Signal Processing: High-resolution SAR processing, SAR/GMTI/STAP and change detection, image filtering, correction and enhancement, and SAR/ISAR signal processing;
E. SAR Systems and Sensors: Spaceborne and airborne SAR systems and missions, advanced and innovative SAR concepts and modes, ground-based systems, and calibration;
F. Radar Technology: Radar components and subsystems, antenna technology and adaptive arrays, UWB, GPR, bio-medical imaging radar systems, and automotive radar.

Fig. 1 represents the word distribution found in the titles of the special issue papers by following the idea in another special issue foreword [4]. Fig. 2 shows the fields of the papers when even fractional counts are applied if a paper ranges over multiple fields. Since disaster monitoring sessions have been held for brainstorming discussion in the conference, the amount of publications in this issue seems not so large. But it is also true that not a few papers categorized into other fields lead strongly to mitigation of disasters after natural or artificial hazards. Application paper amount is large on a par with those on analysis techniques or signal processing.

The biennial APSAR conference series grows steadily. The next one is going to be held in Singapore in September 2015. Enjoy this Special Issue by thinking forward to the future APSAR conferences. The Guest Editors thank all the authors, reviewers, and the members of the conference organizing committee.
REFERENCES


Akira Hirose (F’13) received the Ph.D. degree in electronic engineering from the University of Tokyo, Tokyo, Japan, in 1991.

In 1987, he joined the Research Center for Advanced Science and Technology (RCAST), University of Tokyo as a Research Associate. In 1991, he was appointed as an Instructor at RCAST. From 1993 to 1995, on leave of absence from the University of Tokyo, he joined the Institute for Neuroinformatics, University of Bonn, Bonn, Germany. From 2006 to 2008, he was also an Affiliate Professor with the Institute of Space and Astronautical Science (ISAS), Japan Aerospace Exploration Agency (JAXA), Tokyo, Japan. Currently, he is a Professor with the Department of Electrical Engineering and Information Systems, University of Tokyo. His research interests include wireless electronics and neural networks.

Dr. Hirose is a Senior Member of the Institute of Electronics, Information and Communication Engineers (IEICE) and a Member of the Japanese Neural Network Society (JNNS). He served as the President of the JNNS, the Vice President of the IEICE Electronics Society, the Editor-in-Chief of the IEICE Transactions on Electronics, an Associate Editor of journals such as the IEEE TRANSACTIONS ON NEURAL NETWORKS and the IEEE GEOSCIENCE AND REMOTE SENSING NEWSLETTER, the Chair of the Neurocomputing Technical Group in the IEICE and the General Chair of the 2013 Asia-Pacific Conference on Synthetic Aperture Radar (APSAR), Tsukuba, Japan. Currently, he serves as a Member of Aerospace Engineering Committee of JAXA, the Founding Chair of the Complex-Valued Neural Networks Task Force of the IEEE Computational Intelligence Society (CIS) Neural Networks Technical Committee, the Governing Board Member of the Asia-Pacific Neural Network Assembly, the Chair of IEEE GRSS All Japan Chapter, the General Chair of International Geoscience and Remote Sensing Symposium (IGRASS) 2019 Yokohama, and an IEEE GRSS Distinguished Lecturer.

Paul A. Rosen (M’06–SM’07–F’10) received the B.S. and M.S. degrees from the University of Pennsylvania, Philadelphia, PA, USA, in 1981 and 1982, respectively, and the Ph.D. degree from Stanford University, Stanford, CA, USA, in 1989, all in electrical engineering.

He is currently a Project Scientist for NASA-ISRO Synthetic Aperture Radar (NISAR) Mission at the Jet Propulsion Laboratory. From 2006 to 2012, he was the Manager of the Radar Science and Engineering Section and Project Scientist for the DESDynl Mission Concept. Prior to JPL, he spent 2 years at Kanazawa University, Kanazawa, Japan. He is a Visiting Faculty Member and Lecturer at the Division of Geological and Planetary Sciences at Caltech, and has served on the UCLA Extension Program faculty. His efforts have focussed on SAR and interferometric SAR (InSAR) for Earth and planetary remote sensing, working with scientists to improve our understanding of the physical characteristics of the bodies in our solar system. In this field, he has explored in a number of areas, including signal processing, geodetic imaging, bistatic radar imaging, production processor design, hardware development, mission concept studies, and strategic technical and scientific planning.

Dr. Rosen was a Team Leader of the Shuttle Radar Topography Mission, for which he received NASA’s Exceptional Service Medal (2001) and NASA’s Exceptional Achievement Medal (2002).
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Manfred Zink received the Dipl.-Ing. degree in physics from the Technical University of Graz, Graz, Austria, in 1987, and the Dr.-Ing. degree in geodesy from the University of Stuttgart, Stuttgart, Germany, in 1993.

In 1988, he joined the Microwave and Radar Institute, German Aerospace Center (DLR), Cologne, Germany. He was the Lead X-SAR Calibration Engineer for both SIR-C/X-SAR missions in 1994 and for the SRTM mission in 2000. In August 2000, he joined the European Space Agency (ESA) and took over the responsibility for the calibration/validation of the ASAR onboard ENVISAT. After successful in-orbit commissioning of the ASAR, he was appointed as the Principal System Engineer for ESA’s TerraSAR-L Program. In May 2005, he returned to DLR’s Microwaves and Radar Institute, where he is currently heading the Satellite SAR Systems Department. He is also managing the TanDEM-X Mission with the primary objective to generate a globally consistent DEM of unprecedented accuracy.

Dr. Zing has been an active member of the CEOS Working Group on Calibration and Validation, SAR Subgroup, since 1991, and he has been chairing this group, since 2011. He was the General Chairman of the European SAR Conference (EUSAR) 2014. He was the recipient of the DLR Science Award in 1991 and the EUSAR Best Paper Award in 2008. In 2012, he and his colleagues were presented with the IEEE W.R.G. Baker Prize Paper Award and have been nominated for the “Deutscher Zukunftspreis”—Federal President’s Prize for Technology and Innovation.