Editorial

HIGH-RESOLUTION EARTH IMAGING
FOR GEOSPATIAL INFORMATION, PART II

IN THE PREVIOUS EDITION of *The Photogrammetric Record*, five papers were published which constituted the first of two special issues on high-resolution earth imaging for geospatial information. This issue continues with a further series of articles and comprises the second and final special issue on the topic. Most of the contributions to both these issues of *The Photogrammetric Record* were presented at the ISPRS Hannover Workshop that was held from 29th May to 1st June 2007 at the Institute for Photogrammetry and GeoInformation (IPI), Leibniz Universität Hannover in Germany, and were subsequently extended for publication in *The Photogrammetric Record,* following a widely distributed call for papers. All submissions to the call were subjected to the usual rigorous peer review procedures employed by *The Photogrammetric Record*.

Whereas the first special issue dealt with sensor modelling, calibration and orientation of satellite imagery, the current issue focuses on papers reporting on digital aerial cameras and image analysis approaches for automatically extracting land cover, buildings, roads and traffic information. The first article deals with digital aerial cameras. Based on prior experience at the Catalan mapping agency, Institut Cartogràfic de Catalunya (ICC), *Alamus and Kornus* present a comparison of theoretical standard deviations for object points during bundle adjustment with the accuracies obtained in practical tests. In accordance with other studies the authors show that satisfactory results can only be obtained by using self-calibration.

In the second paper *Grenzdörffer et al.* describe the acquisition and processing of oblique digital images taken with the PFIFF imaging system developed at Rostock University, Germany. Oblique images have become popular recently, partly thanks to the intuitive perception of the image content by humans. The authors show that, in conjunction with specially adapted processing systems, photogrammetric quality can be achieved with these images.

With the third paper by *Le Bris and Boldo* the focus is shifted towards mapping as opposed to image orientation. The authors describe a method of refining the 1:25 000 scale French national topographic base map derived from the national geospatial database by using additional information from aerial images. The database information is interpreted in terms of prior probabilities and fused with the radiometric image information in a "maximum a posteriori per region" classification to derive certain land cover classes in mountainous areas; the results are very convincing.

Ravanbakhsh et al. present an approach for refining road crossings based on high resolution aerial images. Using road centrelines derived from a geospatial database as prior information, ziplock snakes are employed to delineate the borders of the junction areas, the capture radius is extended using a combination of the gradient vector flow method and balloon forces as external energy. A number of examples demonstrate the usefulness of the approach

presented. Roads are also an implicit topic in the contribution by *Hinz et al.* The authors are interested in extracting traffic information from single high-resolution satellite images and aerial image sequences. Based on an explicit model for traffic, different strategies for vehicle and vehicle queue extraction as well as for motion estimation are discussed. Results with a number of test images show that the suggested approach is feasible in practice while also pointing out areas of further research. The final paper of the special issue, by *Rehor et al.*, is concerned with building extraction from lidar data. Based on a disaster management scenario, different approaches are presented for the extraction of both damaged and intact buildings. The contribution of two different plane detection algorithms to a detailed damage classification scheme is studied.

A few general conclusions can be drawn from the material presented. Firstly, digital aerial imagery is well on its way to replacing analogue film images and has already done so in many areas. To reach high accuracy, self-calibration seems to be mandatory. Additional possibilities arise with medium-format camera systems, especially when used in unconventional forms. Secondly, data available in geospatial databases is increasingly being treated as a partial interpretation and thus as prior knowledge when automatically analysing images for topographic mapping. This is a valuable step forward in this rather complex task. Thirdly, when 3D objects are to be extracted it is advisable to use 3D information already available as input, either in the form of stereomatching results or of lidar data. Taking these findings into account can substantially improve the quality of the results of automatic image analysis and have the potential to lead the whole area to a better use in practical applications.

The next ISPRS Hannover Workshop is planned to take place from 2nd to 5th June 2009 in conjunction with the conference of the Association of Geographic Information Laboratories for Europe (AGILE 2009). A call for papers should have been issued by the time this Editorial reaches our readers, who are cordially invited to participate actively in this event, and for further details may wish to visit the IPI web site at http://www.ipi.uni-hannover.de in due course.

Finally, we would like once again to thank all the authors who submitted papers to the special issues. Without their enthusiastic support and readiness to keep to strict timelines, these resulting publications would not have been possible. We also repeat our thanks to the reviewers, whose inputs have led to significant improvements over the original Workshop presentations, to Paul Newby and his Editorial team and to Wiley-Blackwell for the technical production of these issues.

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