

53rd Photogrammetric Week, Stuttgart, September 2011.

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The biennial Photogrammetric Week celebrated its 100th anniversary in 2009, indicating the importance of this event, which regularly attracts around 400 participants. The 53rd Photogrammetric Week, held in Stuttgart from 5th to 9th September, was no exception, attracting 380 participants from 45 countries to hear internationally recognized speakers deliver presentations on key topics in the development of photogrammetry, and to attend demonstrations on the latest software and hardware. This year there were three themes: Digital mapping camera evolution, Point cloud generation and processing, and Towards 3D augmented worlds.

Cramer, speaking on digital camera evolution, showed that the use of digital cameras has now reached a stage of maturity with work flows in which digital cameras are embedded. He also posed the question 'geometry perfect – radiometry unknown?' and stressed the need for good calibration and standards. Medium format digital cameras are now available and there is talk of a 'pixel race' between manufacturers. It is recognized that the improved radiometry can be used to aid feature extraction. A key development in data acquisition is the use of Unmanned Aerial Vehicles (UAVs). These have been used for some time for small projects by enthusiasts, but are now becoming mainstream with companies such as Blom setting up UAV units. Eisenbeiss gave a review of UAVs with case studies and Strecha showed that UAVs are easy to fly but have a small payload, poor georeferencing and low resolution, but that redundancy overcomes all these problems with the essential ingredient of automation. He stated that this enables '*Photogrammetry to go public*'. An issue which is limiting the use of UAVs is the lack of legal regulations, making it unclear where flying is permitted.

There has been controversy in recent years over relative importance of laser scanning and imagery for the generation of point clouds. This was put forcibly by Leberl et al (2010) in their paper on Point Clouds: Lidar versus 3D Vision. Advances in the processing of point clouds is key to this argument and the development of semi-global matching software (Hirschmüller) allows very dense digital elevation models (DEMs) to be generated from digital imagery. Haala and Heuchel showed that dense image mapping is accurate and reliable, accuracy depends on the base to height ratio and number of image ray intersections. Hyypä reviewed laser scanning and showed that a key ability is to penetrate vegetation and demonstrated that forestry is a major user of both airborne and terrestrial laserscanning. Key research issues are the merging of DEMs from different sources and the use of laserscanning with other sensors such as hyperspectral; this is producing more information.

Weber showed that interferometric Synthetic Aperture Radar, particularly from Tandem-X can also produce excellent quality DEMs, including global DEMs. Schindler gave an interesting paper on global DEMs and how they can be improved by merging data.

These practical developments converged towards the final theme of 3D augmented worlds. Frahm gave a presentation on crowd sourced modelling, using images gleaned from sources such as Flickr. Many images are used, and processing takes a relatively long time, but Frahm postulated that in the future we would be able to 'build the world in 6 days' and use dynamic scene modelling to provide scene understanding and intelligence. Fritsch showed how a hybrid approach using a multi sensor, multi ray approach could also be used effectively for heritage documentation. Wilson showed how

more formal imagery can be used very effectively for heritage documentation. She showed how combination of frame images and scanner data can be used to create models and animations. Beers showed how Cyclomedia images could be used with a laser point cloud to give 3D information which gives more information and better visualisation. He noted that 85% of Dutch municipalities used Cyclomedia data for facility management and that the whole country was covered each year.

There were quite a number of sessions devoted to the manufacturers presenting their products. Hexagon and Trimble demonstrated their integrated range of products and emphasised their end to end flowlines which included tools to check quality. Parallel processing is ensuring faster production times, necessary with bigger projects, particularly larger blocks of images. Other presentations were given by ERDAS, Vexcel Imaging/Microsoft, BAE Systems and Ingenieurgesellschaft für Interfaces (IGI).

The papers and demonstrations during the week showed that photogrammetry is alive and well and that there are many interesting developments and that these are widening the use of photogrammetry amongst new communities. The Photogrammetric Week is an excellent way of obtaining a good picture of developments in both industry and research. Dieter Fritsch and his team at the Institute for Photogrammetry are to be congratulated on maintaining the high standard of the event and making this a priority event in the geospatial calendar.

The papers and presentations from the 53rd Photogrammetric Week are available at <http://www.ifp.uni-stuttgart.de/phowo/index.en.html>

Reference

F. Leberl, A. Irschara, T. Pock, P. Meixner, M. Gruber, S. Scholz, and A. Wiechert, 2010. Point Clouds: Lidar versus 3D Vision. *Photogrammetric Engineering & Remote Sensing*, 76(10), 1123–1134.