

**100 years of Photogrammetric Week were celebrated in Stuttgart, Germany
from 7-11 September 2009**

The first Photogrammetric Week was held in Jena Germany in 1909 under the direction of Carl Pulfrich. The series has continued in various locations and under different directors since then. The 100th year of the event was celebrated in Stuttgart from 7-11 September 2009 at the 52rd Photogrammetric Week, under the direction of Professor Dieter Fritsch, head of the Institute of Photogrammetry and Remote Sensing at Stuttgart University. On this occasion I was fortunate to be able to attend together with nearly 500 participants from 62 countries.

Photogrammetric Week is a weeklong event which features details of many of the latest developments in photogrammetry, remote sensing and GIS, but it concentrates on photogrammetry as its name suggests. While the early Photogrammetric Weeks were exclusively devoted to Zeiss equipment, the Photogrammetric Weeks of today include manufacturers, software developers and instrument suppliers from the broad market. The format is based on invited lectures each morning on academic research and the latest developments of hardware and software from manufacturers, followed by demonstrations of equipment during the afternoons from Monday to Thursday. Evenings involve typical German hospitality at such events as the local wine festival which is often being held during the Photogrammetric Week, or other enjoyable activities in true Schwabian (South West German) style.

This year topics discussed during the presentations included a keynote presentation on Cloud Computing, a review of the products available from the various software and hardware providers: then papers were presented on; image based data acquisition; aerial and terrestrial and mobile lidar; and value-added photogrammetry. Most papers covered the very latest developments in these topics, so it was an excellent conference to bring attendees up-to-date with the status of developments in photogrammetry. The conference was also an excellent opportunity to view developments in Europe, which one could say is the birth place of photogrammetry. The Photogrammetry section of the Austrian Society for Surveying and Geoinformation turned 100 in 2008, the German Society for Photogrammetry and Remote Sensing in 2009 and The International Society for Photogrammetry and Remote Sensing (ISPRS) will celebrate its centenary on 4 July 2010 in Vienna.

The presentations revealed the following new developments:

- Cloud computing encompasses new concepts in outsourcing computing for individual organisations to service providers; while it has not yet been widely accepted it could reduced the burden on acquiring computing equipment and personnel by individual organisations; computing would be undertaken by computing service providers, at estimated much lower costs that currently incurred. Characteristics of cloud computing are virtual, elastic and scalable. It is 'infrastructure as a service'.
- The number of medium format cameras available on the market with between 40 and 60Mpixels is growing rapidly. They include Leica RC105, Intergraph RMK D, Vexcel UltraCamL, DiMAC, Applanix DSS (Trimble), Rollei AIC (Trimble), and IGI DigiCam. Tests on the new Intergraph RMK D medium format camera with 42Mpixels demonstrate accuracies approaching those achievable by the large format cameras. The applications of the medium format cameras in the future will be interesting to watch. Some people predict that they will replace so-called large format cameras in the not too distant future. Digital aerial imaging is still a technology under development and further improvements in the number of pixels available in the image, image sensitivity and coverage are expected.

- There is a plea by several academics from Europe to embrace computer vision community to develop more advanced techniques for processing images and to ensure that the photogrammetric community is included in new possibilities of image acquisition and processing, such as crowd sourcing of images
- There was a spirited debate on the need for airborne lidar when multiple overlapping images are available for precise elevation determination. Some believe that lidar is an unnecessary technology, while the majority recognise the advantage of lidar with its high density point sampling where no texture exists in images and its ability to penetrate the canopy of forest vegetation. Accuracies of current lidars are now better than 5cm on hard surfaces. The audience were generally content with the choices available for digital images and lidar.
- 3D city models are increasingly being acquired for many cities in Europe; for example, the company Blom will have 200 cities in Europe covered with 3D models by end of 2009 using Pictometry technology. A 3D city model of Berlin encompassing 500,000 buildings is now available. Bing, formerly Microsoft Virtual Earth, aims to collect 3D information on 3000 cities around the world in 5 years and present the information in 3D. Microsoft's purchase of the Vexcel company in 2006 provides them with the imaging technology. The overall cost of acquiring the 3D city models is expected to be reduced by 90%. There were some impressive demonstrations of the completely automatic procedures being used to extract buildings and display them in 3D.
- In order to facilitate the development of 3D city models a new graphic standard has been developed CityGML.
- MEMS (Micro Electric Mechanical Systems) technologies are a promising much cheaper alternative for IMU systems for the future.
- The company Intermap has derived DEMs with elevation accuracies better than 1m based on airborne interferometric synthetic aperture radar mounted on small jet aircraft. Coverage of UK has been completed, the whole of Europe will be covered by the end of 2009 and USA in 2010. The company is also acquiring elevation data over Australia.

Reports of research by EuroSDR, the European regional group undertaking research in spatial data and the German Society for Photogrammetry and Remote Sensing (Deutsche Gesellschaft for Photogrammetrie und Fernerkunden - DGPF) were reported at the conference. These organisations undertake research on a cooperative basis between practitioners and academics working together, with costs being borne by the participants. Both are undertaking studies of the quality of digital aerial cameras

EuroSDR [<http://www.euroedr.net/start/>] is a rebadged organisation previously known as OEEPE, which was established in 1953 to undertake research in various aspects of photogrammetry. It has 17 members, comprising national mapping agencies, universities and other organisations, which are not restricted to the European region. The organisation has produced many useful publications since its inception. However, since the topics now studied by the organisation are broader than just photogrammetry, the new name reflects this change in emphasis. Results of their investigations can be found by visiting their web site.

While the DGPF's recent tests on digital aerial cameras are not yet complete, some conclusions were presented to the conference as follows:

- There are no significant differences between the results derived from the different cameras
- The large format aerial cameras can achieve accuracies of 0.5 GSD (ground sampling distance)

- Digital aerial cameras result in accuracies considerably lower than can be achieved with film cameras for which accuracies were more than 1 pixel.
- Self calibration is still necessary to achieve the highest results.
- Least squares image matching, which is the process of matching areas or features in images to determine elevations on multiple overlapping digital aerial images with overlaps of 80% forward and 60% sidelap, resulting in up to 12 images of every point, now reveals accuracies of 0.1 to 0.3 pixel.
- Tests on the extraction of thematic information from digital cameras revealed no significant differences between the cameras, but the processes of radiometric correction are different for each camera.

Details of the German Society's tests of digital aerial cameras will be available later this year in English.

John Trinder
September 2009