

# ISPRS DAILY

## The XXI Congress

The International Society  
for Photogrammetry and Remote Sensing

3-11 July 2008 Beijing, China

Monday 07 July 2008

### The Honorable Road to Brock Gold

*Armin Gruen discusses the scientific achievements that led him to the Brock Gold Medal Award and his naming as an honorary member of the ISPRS.*



"Firstly, I must clearly state that most of my achievements are the result of team efforts. I could never have achieved these things alone. There were always many talented and diligent people involved – collaborators, PhD candidates, post-doctorate students, etcetera – and I am very grateful for their contributions.

"Up to my PhD thesis I worked mainly in the close-range photogrammetry domain, with a focus on architectural photogrammetry. This is reflected in my PhD thesis, Reconstruction of Rotational Surfaces from Single Images.

"After my dissertation, my interest also turned to aerial photogrammetry. From 1976 to 1980 I worked on self-calibration and on the reliability of photogrammetric

systems, for both the terrestrial and aerial cases.

"During my time in the US, I concentrated on the development and investigation of new algorithms for sequential estimation in bundle systems and on new algorithms for image matching. I introduced several new versions of the Least Squares (LS) Image Matching technique, with a variety of geometrical constraints and simultaneous multi-image matching. The aim was to make matching more reliable and accurate.

"When I came to ETH Zurich in 1984, I concentrated fully on different issues of digital photogrammetry and remote sensing. I recognised early the great potential of CCD cameras – which were becoming available to a larger audience at that time – for measurement purposes. We developed, in Zurich, new automated techniques for image measurement (least squares template matching) and camera/system calibration and conducted many investigations into the modeling of systematic errors and the testing of the accuracy performance of terrestrial systems. I also strongly promoted the interdisciplinary co-operation between photogrammetry, machine vision and computer vision for the advancement of our science.

*Continued on page 3...*



### General Assembly Plans Ahead

Delegates gathered at the 2nd General Assembly to elect the 2008 to 2012 presidents of the eight technical commissions. The results are as follows:

- Commission I – Canada – Naser El-sheimy
- Commission II – Hong Kong, China – John Shi Wenzhong
- Commission III – France – Nicolas Pappadimitris
- Commission IV – United States of America – Marguerite Madden
- Commission V – United Kingdom – Jonathan Philips Mills
- Commission VI – The Netherlands – Martien Molenaar
- Commission VII – Austria – Wolfgang wagner
- Commission VIII – Japan – Haruhisa Shimoda

### CONTENTS

Page 1 • General Assembly

Page 1 • Congress Award

Page 3 • Congress Award (cont.)

Page 4 • Earthquake Relief

Page 5 • Earthquake Relief (cont.)

Page 6 • Technical Commission Report

Page 7 • Technical Commission Report

Page 8 • The week that was...



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During the late nineties, Gruen worked on 3D modelling of natural and cultural heritage such as the Buddhas of Bamiyan, Mount Everest and Ayers Rock. Image source: Google

Early in his career, Gruen worked mainly in the close-range photogrammetry domain, with a focus on architectural photogrammetry.



(continued from page 1)

"At the same time we were developing and promoting the new concept of a Digital Station as a processing platform for digital images. These systems are nowadays the working horses of the professional practice. We did significant work on a system for the measurement of turbulent flow, based on the PTV principle and using several CCD cameras. Even today this system is still unique worldwide and used by many research groups.

"In the following years we introduced new processing algorithms for terrestrial and aerial photogrammetry with the LSB-Snakes for line feature extraction and with CyberCity Modeler. CyberCity Modeler is nowadays a very popular approach for the semi-automated generation of 3D city models.

"During the late nineties, I turned my research interest to the 3D modelling of natural and cultural heritage. In a number of projects of high public visibility (Geoglyphs of Nasca, Buddhas of Bamiyan, Mount Everest, Ayers Rock) we demonstrated how modern digital photogrammetry can be efficiently used to record, model and visualise cultural heritage objects, especially large site models.

"After the introduction of large format linear array aerial cameras, my group developed a full suite of new methods and the related software package, containing all important processing functions. This includes innovations in sensor and trajectory modelling, ortho-image generation and, in particular, a module for fully-automated Digital Surface Model

generation. These methods, with some modifications, were also applied to the stereo processing of very high resolution satellite stereo imagery. This resulted in the software package SAT-PP, which is currently on its way to commercialisation.

"I will be retiring from my regular University work at the end of July 2009. There are many commitments and options which I will pursue beyond this date: guiding PhD candidates, carrying on with the co-chairmanship of the WGVI/6 Special Interest Group *Technology Transfer Caravan* and with the chairmanship of the ISPRS ISAC Committee, participating in research projects on international level, doing more work related to Natural and Cultural Heritage, establishing a spin-off company, writing, writing and writing (textbook, articles, editorials)...

"There are still many exciting projects ahead. And as I have said on other occasions: photogrammetry has never been more interesting and challenging than today. It is very tempting for me to remain part of the near future developments."

**Armin Gruen**  
Winner of the Brock Gold Medal Award  
Honorary Member, ISPRS

*The Brock Gold Medal Award is donated by the American Society for Photogrammetry and Remote Sensing, and is awarded for an outstanding landmark contribution to the evolution of the photogrammetry, remote sensing and spatial information sciences.*

*An individual is elected as an honorary member in recognition of distinguished services to the ISPRS and its aims.*

## Editorial Team

The local organising committee will publish eight issues of ISPRS Daily: Thursday, Friday, Saturday, Monday (7th July), Tuesday, Wednesday, Thursday and Friday.

If you would like to contribute editorial, please submit material to Inga or Vienna no later than noon each day.

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### Today's Highlights

7 July 2008 - Monday

#### Exhibition

◆ **Opening Ceremony**  
Time: 10:10-10:30  
On the First Floor

◆ **Show Hours**  
Time: 09:00-17:00  
On the First Floor

#### Technical Visits

◆ **TV-1: National Geomatics Center of China (NGCC)**  
08:30 Depart from BICC for NGCC  
11:00 Leave NGCC for BICC

◆ **TV-2: Chinese Academy of Surveying and Mapping (CASM)**  
13:00 Depart from BICC for CASM  
15:00 Leave CASM for BICC

◆ **TV-7: NavInfo Co., Ltd. (NavInfo)**  
13:00 Depart from BICC for NavInfo  
15:00 Leave NavInfo for BICC

◆ **TV-8: National Satellite Meteorological Center (NSMC)**  
08:30 Depart from BICC for NSMC  
11:00 Leave NSMC for BICC

◆ **TV-9: Twenty First Century Aerospace Technology Co., Ltd. (TFCAT)**  
13:00 Depart from BICC for TFCAT  
15:00 Leave TFCAT for BICC



## Photogrammetry and Remote Sensing to the Rescue

*Keynote speaker and recipient of the Samuel Gamble Award Professor Li Deren discusses the role of photogrammetry and remote sensing in the Wenchuan earthquake relief effort.*

An earthquake measuring 8.0 on the Richter scale struck Wenchuan County, Sichuan Province at 14:28 on 12 May 2008. The epicentre was at Yingxiu, a town in Wenchuan.

Figure 1 shows the epicentre, Yingxiu, enclosed by the middle segment of the Longmen Mountain earthquake zone. The Longmen Mountain region is part of the north-south earthquake zone in China.

Records show that since 1729, nine earthquakes larger than Grade 8 have occurred in the north-south earthquake zone; seven of these were after 1897. The greatest earthquakes occurred at Haiyun in 1920 and Chayu in 1950. Both measured 8.5 on the Richter scale.

The worst-hit areas of the Wenchuan earthquake include Beichuan and Qingchuan, where the earthquake's intensity measured 11. The maximum rating by Chinese seismic survey standards is 12. By noon on 3 July 2008, the death toll stood at 69,170, with 374,159 people injured, 17,428 missing and 48,270,000 severely impacted.

The main goal of Phase I of the relief effort was the rescue of people buried under the rubble. High-resolution aerial and satellite imagery was used to locate collapsed buildings in the worst-hit areas so rescuers could be dispatched quickly.

Phase II concentrated on prevention and preparedness for secondary disasters such as landslides and mudslides, especially in and around the quake lakes or barrier lakes that form when a landslide plugs a river. Airborne and space-borne optical imagery and radar data were required for identification, assessment and



decision-making for locations prone to such secondary disasters.

Phase III focused on disaster assessment and reconstruction. Relief teams undertook topographic mapping at 1:10,000 scale, with an area extent of 120,000 square kilometres.

The maps were based on the technique of aerial photogrammetric survey without ground control points to generate

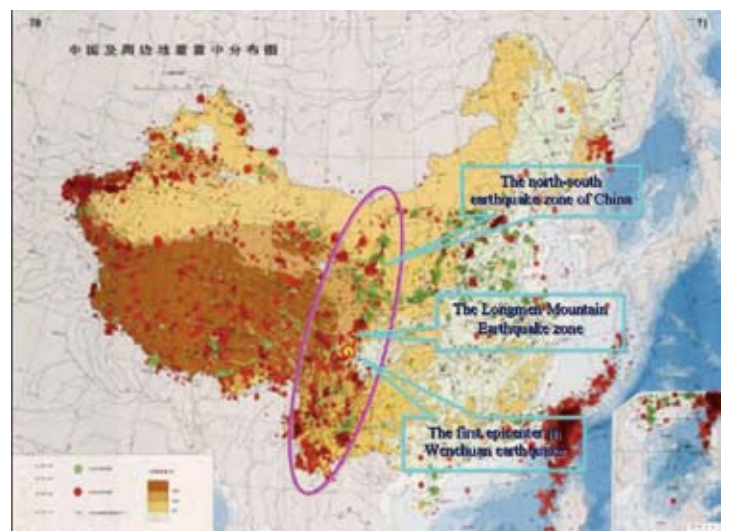


Figure 1. The Wenchuan earthquake in context



Figure 2. The beauty of Beichuan before the earthquake, and the devastation afterwards.

## What's on the Menu

8 July 2008 - Tuesday

### Exhibition

◆ **Show Hours**

Time: 09:00-17:00  
On the First Floor

### Technical Visits

◆ **TV-3: Institute of Remote Sensing Applications (IRSA) & Institute of Geographic Sciences and Natural Resources Research (IGSNRR)**

08:30 Depart from BICC for IRSA and IGSNRR  
11:00 Leave IGSNRR for BICC

◆ **TV-10: Beijing Eastdawn Information Technology Inc. (EDIT)**

**Morning**

08:30 Depart from BICC for EDIT  
11:00 Leave EDIT for BICC

**Afternoon**

13:00 Depart from BICC for EDIT  
15:00 Leave EDIT for BICC

### Social Program

◆ **SE-6: Laoshe Tea House**

Time: 19:50-21:20  
Depart from BICC at 18:00  
(Dinner at Fangshan Restaurant)

information products such as digital elevation models, digital orthophoto quadrangles, and digital line graphs.

Topographic mapping in urban areas was performed at a larger scale of 1:2,000. These maps allowed people in the disaster areas to plan reconstruction of their homes.

Photogrammetry and remote sensing played a crucial role in the aftermath of the earthquake. Rapid data acquisition and information services, especially those provided by fully automatic, near real-time remote sensing systems without ground control, enabled search and rescue work and disaster relief to be completed at a much faster rate.

Photogrammetry and remote sensing is becoming increasingly visible and its

“

*High-resolution aerial and satellite imagery was used to locate collapsed buildings in the worst-hit areas so rescuers could be dispatched quickly.*

power increasingly understood.

It is important to develop a national-level rapid response system that can corroborate work by different agencies and facilitate data and resource sharing.

This requires the further development of China's National Spatial Data Infrastructure and the enhancement

of high-resolution earth observation systems.

Last but not the least, these initiatives must be underpinned by strong international co-operation in spatial information science and technology. The International Charter and GEOSS from GEO represent an excellent beginning.

**Li Deren**  
Professor at Wuhan University

Enjoying the Congress? Purchase your raffle tickets to support future ISPRS activities. Raffle tickets are on sale at the TIF Registration Booth on BICC Level 1.

3-11 July 2008 Beijing, China

## Technical Commission Report

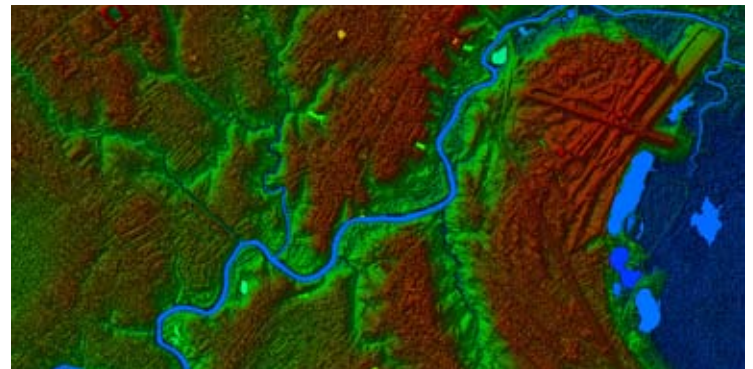
### Technical Commission Report I: Image Data Acquisition – Sensors and Platforms

The seven working groups of TC I are contributing almost 100 papers in oral sessions and 200 posters to the Congress. A large number of these presentations are related to WG I/2 (SAR and LiDAR systems), showing the increasing interest for these techniques.

The fast development of LiDAR was demonstrated in a plenary presentation by Juergen Dold from Leica Geosystems. Within the last year, the accuracy has been improved by a factor of four and the time of the survey has been cut by a factor ten. At the same time, the cost has decreased and the systems have become more portable and versatile. New SAR processing techniques were presented in one of our sessions.

Another presentation from Jose Achache demonstrated the interest in enhancing co-ordination of space-borne, airborne and terrestrial acquisition systems. This is the goal of GEOSS, the Global Earth Observation System of Systems, proposed by GEO, the Intergovernmental Group on Earth Observation. GEO is a collection of 74 countries and 51 organisations working

together for the benefit of society. International collaboration was also covered in the Special Session SS-1 on Operation and International Co-ordination for Earth Observing Systems.



Within the last year, the accuracy of LiDAR has been improved by a factor of four and the time of the survey has been cut by a factor ten, according to Juergen Dold of Leica Geosystems.

### Program of the Day

- ◆ **Plenary Session 2 (PTS-2)**  
Time: 08:30-10:00  
Room: (Convention Hall No.1)
- ◆ **TS SS-3: Spatial Data Infrastructure (SDI) and Spatial Information Grid (SIG)**  
Time: 10:30-12:00  
Room: (Convention Hall No.2A)
- ◆ **TS WG III/2 & ICWG III/V: Image Sequences and Surfaces**  
Time: 10:30-12:00  
Room: (Convention Hall No.2B)
- ◆ **TS WG VIII/1 (1): Human Settlements and Impact**  
Time: 10:30-12:00  
Room: (Convention Hall No.2C)
- ◆ **TS SS-13: Education and Capacity Building in Geomatics**  
Time: 10:30-12:00  
Room: (201A Conference Room)
- ◆ **TS WG IV/5 (2): Web-based Geo-information Services and Applications**  
Time: 10:30-12:00  
Room: (201B Conference Room)
- ◆ **TS ThS-3: DEM Generation with High Resolution Optical Satellite Sensors**  
Time: 10:30-12:00  
Room: (305C Conference Room)
- ◆ **TS WG IV/3 (1): Automated Geo-spatial Data Acquisition and Mapping**  
Time: 10:30-12:00  
Room: (305B Conference Room)
- ◆ **TS WG I/2 (3): Accuracy Validation of Lidar Data**  
Time: 10:30-12:00  
Room: (307 Conference Room)
- ◆ **TS WG II/3 (1): Multiple Representations of Image and Vector Data**  
Time: 16:00-17:30  
Room: (Convention Hall No.2A)
- ◆ **TS WG I/1: Standards, Calibration and Validation**  
Time: 16:00-17:30  
Room: (Convention Hall No.2B)
- ◆ **TS WG IV/9 (2): Mapping from High Resolution Data**  
Time: 16:00-17:30  
Room: (Convention Hall No.2C)
- ◆ **TS WG V/2 (1): Modeling of Cultural Heritage Objects**  
Time: 16:00-17:30  
Room: (201A Conference Room)
- ◆ **TS WG VI/2: E-learning**  
Time: 16:00-17:30  
Room: (201B Conference Room)
- ◆ **TS WG VII/2 (2): Information Extraction from SAR Data**  
Time: 16:00-17:30  
Room: (305C Conference Room)
- ◆ **TS ThS-17: Geo-information Contribution to Sustainability Indicators**  
Time: 16:00-17:30  
Room: (305B Conference Room)
- ◆ **TS SS-8 (1): From National Mapping to a European Spatial Data Infrastructure**  
Time: 16:00-17:30  
Room: (307 Conference Room)

## Technical Commission Report

### Technical Commission IV: Geodatabases and Digital Mapping

Maps have been an effective means of representing information for the last 2000 years. The development of space, geospatial, computing and communication technologies has significantly altered the acquisition, organisation, analysis and dissemination of information.

A major issue is updating databases routinely. Databases on a variety of themes have been produced at the global, national and local levels. They have been effectively used for resource management, climate change and environmental protection. We are developing techniques to update these databases automatically. The recent availability of high resolution stereo data from aerial and satellite platforms has revolutionised data acquisition and provided an opportunity to develop techniques for automatic data extraction. Image databases with high temporal resolution are expanding, especially for ocean applications.

Developments in visualisation allow us to display landscapes and seascapes virtually, and to depict both global and local processes. The use of GIS to access, analyse and disseminate spatial data has enhanced web-based services. Advancements in grid computing-facilitated web GIS allows us to more efficiently manage massively distributed computing/storage resources. Open-source software provides new, cost-effective solutions to web-based geospatial information and services. Location-



Maps have been an effective means of representing information for more than 2000 years – even though the way they represent this information has changed dramatically in recent times.

based services enable wired and wireless users to integrate geospatial information in developing a solution. The continuing development of open standards and interoperability opens up enormous potential for sharing scientific data. In the future, data will be supplied to the variety of users and to common web-based and location based service standards.

Database application and service development for the benefit of society encompasses many critical areas: disaster management, climate modelling, natural resource management and ecosystem protection are only some of these areas. The effective use of geospatial technology has driven the development of early warning centres, especially for tsunamis. It has also fuelled dramatic improvements in disaster and emergency response. Geospatial technology has been used for data acquisition, organisation, representation, visualisation, analysis, modelling and dissemination of advisories, including the generation of hazard or risk maps. Rescue and relief operations rely on the collection, integration and analysis of data – including 3D data – within the first few hours or days.

A number of missions to explore the resources of our solar system are currently underway. The data supplied by these missions has started a new chapter in the mapping of extra-terrestrial systems and the creation of web-based spatial databases.

The Beijing Congress will witness the culmination of research by TC IV working groups. It reflects the current state of knowledge in the field of geospatial technology and applications.



## The Evolution of LiDAR Systems

Juergen Dold, senior vice president of Leica Geosystems, BA Imaging & Scanning was invited to present at this plenary session with a topic of *The Evolution of Lidar Systems in the Geospatial and Surveying Market*. Dold introduced the history of LiDAR in the first decade of high-performance digital imaging before describing the second decade of LiDAR from Cloud of Points to 3D images respectively.

"It's not a matter of 'if'; it's a matter of 'when,'" said Dold. "Imaging, LiDAR and their fusion will be applied everywhere."

3-11 July 2008 Beijing, China

The week that was...

The week that was...



◀ Alright, we need to do this and- hey, listen to me!

Just go in already! ▶



◀ Let us all snack while other people are working hard.

Just take one, and move on!



▲ Where does this go?

If you take a look there, you'll see something nice! ▶

