



**ISPRS Workshop on Updating Geo-spatial Databases with Imagery  
&  
The 5<sup>th</sup> ISPRS Workshop on DMGISs**

**Urumchi, Xinjiang, China**

**August 28-29, 2007**

# **PROGRAMME**

## **Organiser**

ISPRS Working Group IV/1 (Spatial Data Infrastructure)

## **Co-Organisers**

ISPRS Working Group IV/3 (Automated Geo-Spatial Data Acquisition and Mapping)

ISPRS Working Group VII/4 (Advanced Classification Techniques)

ISPRS Working Group VII/5 (Processing of Multi Temporal Data and Change Detection)

ISPRS Working Group VII/6 (Remote Sensing Data Fusion)

ISPRS Inter-Commission Working Group II/IV (Dynamic and Multi-Dimension Systems and Applications)

## **Sponsors**

National Natural Science Foundation of China

State Bureau of Surveying and Mapping, China

National Geomatics Center of China

ESRI China (Beijing) Limited

Xinjiang Bureau of Surveying and Mapping, China

State Key Lab of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University

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**Published by**

ISPRS Working Groups  
- WG IV/1 "Spatial Data Infrastructure"

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## Introduction

In the past few years, many geo-spatial databases have been established or completed at national, regional and municipal levels over the world. Nowadays, more and more efforts have been devoted to the continuous updating of these geo-spatial databases. Higher resolution remote sensed imagery has been used for change detection, topographic data revision and thematic information extraction, as well as dynamic monitoring. This has stimulated research and developments towards dynamic updating and monitoring with imagery. This ISPRS workshop will serve as an inter-disciplinary forum for leading researchers in the field "Updating Geo-spatial Databases with Imagery". They will present the latest development and applications, to discuss the cutting-edge technology, to exchange research ideas, and to promote international collaboration. It will also be the 5th ISPRS event of 'Dynamic and Multi-dimensional GISs' and one of the events of "ISPRS Silk Road Caravan Program".

The workshop is organized by ISPRS WG IV/1 "Spatial Data Infrastructure". The co-organizers of the workshop include ISPRS WG IV/3 "Automated Geo-Spatial Data Acquisition and Mapping", WG VII/4 "Advanced Classification Techniques", WG VII/5 "Processing of Multi Temporal Data and Change Detection", WGVII/6 "Remote Sensing Data Fusion" and ICWG II/IV "Dynamic and Multi-Dimension Systems and Applications". It was sponsored by National Natural Science Foundation of China, State Bureau of Surveying and Mapping of China, National Geomatics Center of China, ESRI China (Beijing) Limited, Xinjiang Bureau of Surveying and Mapping, State Key Lab of Information Engineering in Surveying, Mapping and Remote Sensing.

Forty one papers were received from all over the world. They are all included in this proceeding.

On behalf of the organization committee of the workshop, we would like to thank all ISPRS Council members, the keynote speakers and all participants of the workshop for their strong support. And our most heartfelt thanks also go to the committee members of the workshop.

JIANG Jie

July 28, 2007

## **BACKGROUND AND OBJECTIVE OF THE WORKSHOP**

In the past few years, many geo-spatial databases have been established or completed at national, regional and municipal levels over the world. Nowadays, more and more efforts have been devoted to the continuous updating of these geo-spatial databases. Higher resolution remote sensed imagery has been used for change detection, topographic data revision and thematic information extraction, as well as dynamic monitoring. This has stimulated research and developments towards dynamic updating and monitoring with imagery.

This ISPRS workshop will serve as an inter-disciplinary forum for leading researchers in the field "Updating Geo-spatial Databases with Imagery". They will present the latest development and applications, to discuss the cutting-edge technology, to exchange research ideas, and to promote international collaboration. It will also be the 5th ISPRS event of 'Dynamic and Multi-dimensional GISs' and one of the events of "ISPRS Silk Road Caravan Program".

### **WORKSHOP ORGANISING COMMITTEE**

Chair: Jie JIANG (Chair, ISPRS WG IV/1), China  
Co-chairs: Jianya GONG (Chair, ISPRS WG VII/5), Wuhan University  
Qiming ZHOU (ISPRS Book Review Editor), Hong Kong Baptist University  
Renliang ZHAO, National Geomatics Center of China  
Members: Xinming TANG (Co-Chair, ISPRS WG II/1), CASM, China  
Yun ZHANG (Co-Chair, ISPRS WG VII/4), University of New Brunswick, Canada  
Jie SHAN (Co-Chair, ISPRS WG VII/6), Prudue University, USA  
Jianqing ZHANG, Wuhan University, China  
Quanzhan LI, Xinjiang Bureau of Surveying and Mapping, China  
Bin LIU, Geomatics Center of Xinjiang, China  
Wanzeng LIU, National Geomatics Center of China  
Gang HAN (Secretary, ISPRS WG IV/1), National Geomatics Center of China

### **SCIENTIFIC COMMITTEE**

Chair: Deren LI, Wuhan University, China  
Co-chairs: Jun CHEN (ISPRS Congress Director), National Geomatics Center of China  
Zhilin LI (Co-Chair, ISPRS IC WG II/IV), Hong Kong Polytechnic University  
Members: Zuxun ZHANG, Wuhan University, China  
Christian HEIPKE (Chair, ISPRS WG IV/3), University of Hannover, Germany  
Christopher GOLD (Chair, ISPRS IC WG II/IV), University of Glamorgan  
Pontypridd, UK  
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Roman ARBIOL (Chair, ISPRS WG VII/4), Institut Cartografie de Catalunya, Spain  
Liqiu MENG, Technical University Munich, Germany  
Ben GORTE (Co-Chair, ISPRS WG VII/5), University of Delft, The Netherlands  
Arpad BARSZ (Co-Chair, ISPRS WG IV/1), Budapest University of Technology and  
Economics, Hungary  
Else SWINNEN (Co-Chair, ISPRS WG VII/5), VITO-Flemish Institute for Technological  
Research, Belgium  
Katarzyna DABROWSKI-ZIELINSKA (Co-Chair, ISPRS WG VII/6), Remote Sensing  
Institute (IGIK), Poland  
Uwe STILLA (Chair, ISPRS WG III/5), Technische Universitaet Muenchen, Germany

## WORKSHOP SECRETARIAT

### For Papers and Technical Programme

Dr. Renliang ZHAO  
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### For Workshop Registration and Hotel & Tour Reservation

Ms. Zhao Huan  
China Comfort Travel Group Co., Ltd  
12th Floor, Jingchao Plaza, No.5, Nongzhanguan Nanlu, Beijing 100026, China  
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Fax: +86 10 6530 1683  
E-mail: zhaohuan@cct.cn

### Workshop Website

<http://isprs-wg41.nsvdi.gov.cn/>  
<http://www.commission4.isprs.org/wg1>

## WORKSHOP VENUE

The Workshop will be held in the Hongfu Hotel (★★★★★), which is located in the center of Urumchi.

Add: No.26 Huanghe Road, Urumchi, Xinjiang, 830000, P. R. China  
Tel: +86-991-5881588  
Fax: +86-991-5823188  
<http://www.hongfuhotel.com>

If you go by taxi, please show the following sign to the taxi driver if necessary.

请送我到乌鲁木齐鸿福大饭店

Please take me to Hongfu Hotel

地址：乌鲁木齐黄河路26号

Address: No. 26 Huanghe Road, Urumchi

电话：86-991-5881588

Tel: 86-991-5881588

## REGISTRATION

The registration fee of the workshop is listed below.

Participant	RMB 2000	all workshop sessions, workshop proceedings, the material package, the identity badge, welcome dinner in the evening of Aug.28, lunches and coffee breaks from Aug.29th to 29th
Full time student	RMB 1500	
Full time student	or RMB 1200	all workshop sessions, the material package, the identity badge, the workshop proceedings, coffee breaks from Oct.14th to 16th
Accompanying person	or RMB 800	access to the Workshop Venue, the material package with a local souvenir, the identity badge, the welcome reception, dinner in the evening of Oct.15, the lunches and coffee breaks from Oct. 14th to 16th

The Workshop has authorized China Comfort Travel Group Co., Ltd. (CCT), as the official Workshop Agency to handle all the registration and hotel reservation.

All participants are required to submit a completed REGISTRATION FORM and the registration fee before Sept.15, 2005. The pre-registered participants are expected at the registration desk to pick up the Workshop materials, ensure all the reservations or make small adjustments if necessary, simply by showing the confirmation of registration received from the Workshop Secretariat.

The participants who are not pre-registered are requested to go through the registration procedures at the on-site registration desk. Since the reservations of the hotel rooms, social events and tours will be made on first-come-first-served basis, some requirements might not be met at the time of on-site registration.

The Registration Desk will be open for on-site registration and enquires.

Date	Open Hours	Place
Monday, August 27	10:00-24:00	Lobby, Hongfu Hotel
Tuesday, August 28	08:00-10:00 10:00-19:00	Lobby, Hongfu Hotel Office of Workshop Secretariat
Wednesday, August 29	10:00-19:00	Office of Workshop Secretariat

### Workshop Programme at a Glance

<b>Tuesday 28 August</b>	10:00-11:00	Opening Ceremony	
	11:00-11:30	Tea Break	
	11:30-14:00	Keynote Speeches	
	14:00-15:30	Lunch	
	15:30-17:10	Plenary Session (PL)	
	17:10-17:30	Tea Break	
	17:30-19:30	Special Session for Dr.Shermen WU's 80th Birthday	
	20:30-23:00	Dinner	

<b>Monday 29 August</b>	10:30-12:10	Technical Session 1 (TS1)	Technical Session 2 (TS2)
	12:10-12:30	Tea Break	
	12:30-14:10	Technical Session 3 (TS3)	Technical Session 4 (TS4)
	14:10-15:30	Lunch	
	15:30-17:10	Technical Session 5 (TS5)	Technical Session 6 (TS6)
	17:10-17:30	Tea Break	
	17:30-19:10	Technical Session 7 (TS7)	
	19:10-19:30	Closing Ceremony	
	20:30-22:30	Supper	

## WORKSHOP PROGRAMME

<b>Monday, 27 August</b>	
10:00-24:00	Arrival and Registration (Lobby)
<b>Tuesday, 28 August</b>	
10:00-11:00	Arrival and Registration (Lobby)
11:00-12:00	<p><b>Opening Ceremony</b> (Silver Wing Ballroom No.1) Chair: Jie JIANG</p> <p><b>Welcome Addresses</b>  <i>Ian Dowman</i>, President of ISPRS, U.K.  <i>Chaozhi SONG</i>, Vice Director of State Bureau of Surveying and Mapping, China  <i>Officer</i> from Science and Technology committee of Xinjiang  <i>Quanzhan LI</i>, Director of Xinjiang Bureau of Surveying and Mapping, China</p>
12:00-12:30	Tea Break
12:30-14:00	<p><b>Keynote Speeches</b> (Silver Wing Ballroom No.1) Chair: Deren LI</p> <p><b>From digital photogrammetry workstation(DPW) to digital photogrammetry grid(DPG)</b> <i>Zuxun ZHANG</i>, Wuhan University, China</p> <p><b>Spatial Database Update and Validation – Current Advances in Theory and Technology</b> <i>Peter Woodsford</i>, University College, U.K.</p> <p><b>Update and refinement of geospatial data from imagery</b> <i>Christian Heipke</i>, Leibniz Universität Hannover, Germany</p>
14:00-15:30	Lunch (Market Fresh Grand Café in Hongfu Hotel, Ticket Required)
15:30-17:10	<p><b>Plenary Session 1: Advanced Development of Updating</b> (Silver Wing Ballroom No.1) Chair: Orhan Altan</p> <p><b>The role of new technology for updating databases</b> <i>Ian Dowman</i>, President of ISPRS, University College London, U.K</p> <p><b>What Can Vision Cruiser Do for You</b> <i>Deren LI</i>, Wuhan University, China</p> <p><b>Dynamic Cartography Using Voronoi/Delaunay Methods</b> <i>Christopher GOLD</i>, University of Glamorgan, UK</p> <p><b>Updating 1:50K databases with imagery</b> <i>Jun CHEN</i>, Congress Director of ISPRS, National Geomatics Center of China, China</p> <p><b>Feature extraction with ERDAS</b> <i>Dong SHANG</i>, ESRI China (Beijing) limited, China</p>
17:10-17:30	Tea Break
17:30-19:30	<p><b>Plenary Session 2: Special session for Dr.Shermen WU's 80th Birthday</b> (Silver Wing Ballroom No.1) Chair: Jun CHEN</p> <p><b>Homage to Sherman Wu, better known as "Mr. Mars" on the occasion of his 80<sup>th</sup> birthday</b> <i>Gottfried Konecny</i>, Leibniz Universität Hannover, Germany</p> <p><b>Real Time Photogrammetry</b> <i>Sherman S. C. WU</i>, U.S. Department of Energy, USA</p> <p><b>Back to Earth - High Accuracy 3D Processing of Satellite Images</b> <i>Armin Gruen</i>, Institute of Geodesy and Photogrammetry ETH Zurich, Switzerland</p> <p><b>Remote Sensing For Assessing Environmental Impacts Based On Sustainability Indicators</b> <i>John Triner</i>, 1<sup>st</sup> Vice Chairman of ISPRS, University of NSW, Australia</p> <p><b>The ISPRS Foundation</b> <i>Lawrence W. Fritz</i>, ISPRS Foundation, Lockheed Marin Corporation, USA</p>
20:30-23:00	<p><b>Welcome Dinner &amp; Dr.Shermen WU's 80th Birthday Party</b></p> <p>VIP Wing Ballroom in Hongfu Hotel (Ticket required)</p>

**Wednesday, 29 August**

10:30-12:10

**Technical Session 1: Imagery-based change detection** (Silver Wing Ballroom No.2)

Chair: Christian Heipke

**Semi-Automatic Verification of Geodata for quality Management and updating of GIS***P. Helmholz, C. Becker, C. Heipke, S. Müller, J. Ostermann, M. Pahl, M. Ziems*, Leibniz Universität Hannover, Germany**Change detection for updates of vector database through region-based classification of VHR satellite data***Carleer Alexandre, Wolff Eléonore*, Université Libre de Bruxelles, Belgium**Research on Key Points of 3D Change Detection of Geospatial Database***Song XIA, Deren LI*, Zhongnan University of Economics and Law, China**Automatic Detection Technique of Residential Area Change Based on Topological Analysis***Hua WANG, Li PAN, Hong ZHENG, Pengfei LIU*, Wuhan University, China**Change Detection of Wetland in Hongze Lake Using a Time Series of Remotely Sensed Imagery***Landi XIA, Renzong RUAN, Xingnan ZHANG*, Hohai University, China**Technical Session 2: Dynamic GIS** (Silver Wing Ballroom No.3)

Chair: Christopher GOLD

**The Development of a Dynamic GIS for Maritime Navigation Safety***R. I. Goralski, C. M. Gold*, University of Glamorgan, UK**Augmented quad-edge – 3D data structure for modelling of building interiors***P. Boguslawski, C.M. Gold*, University of Glamorgan, UK**Finite Difference Method Runoff Modelling Using Voronoi Cells***Maciej Dakowic, C.M. Gold*, University of Glamorgan, UK**The Basic Topology Issues on Spherical Surface Quaternary Triangular Mesh***Miaole HOU, Xuesheng ZHAO, Jun CHEN*, Beijing Institute of Civil Engineering and Architecture, China**Calculating topological spatial relations based on region algebra: the thinking in adjacency relationship***Jiatian LI, Jun CHEN, Renliang ZHAO, Li MA, Hao CHEN*, China University of Mining and Technology (Beijing), China

12:10-12:30

Tea Break

12:30-14:10

**Technical Session 3: Data fusion and integration** (Silver Wing Ballroom No.2)

Chair: Jie JIANG

**Delineation of field boundaries integrating imagery and GIS-data***Matthias Butenuth*, Leibniz Universität Hannover, Germany**Data fusion and integration for multi-resolution online 3D environmental monitoring***Yun ZHANG, Pingping XIE, Hui LI*, University of New Brunswick, Canada**Data harmonisation and optimisation for development of multi-scale vector databases***M. Bernard, T.Rousselin, N.Saporiti, M.Chikhi*, Spot Image, France**A Generative Description of Stairs Using Attributed Stochastic Shape Grammars***Joerg Schmittwilken, Lutz Pluemer, Thomas H. Kolbe*, University of Bonn, Germany**Modeling and Implementation of Navigable Geographic Framework Data — Construction of road network based on fundamental geographic data***Wei HUANG, Lifan LIU, Yong ZHAO, Guizhi WANG*, National Geomatics Center of China, China**Technical Session 4: 3D modeling** (Silver Wing Ballroom No.3)

Chair: P. Helmholz

**Generative models and Markov Chain Monte Carlo techniques for detection and reconstruction of stairs from 2D point clouds***Jens Saatkamp, Jörg Schmittwilken*, University of Bonn, Germany**Building Reconstruction Using LIDAR Data***R. O.C. Tse, C.M. Gold, D.B. Kidner*, University of Glamorgan, UK**Improvement of the fidelity of 3D architecture modeling combining 3D vector data and uncalibrated image sequences***Hongwei ZHENG, Volker Rodehorst, Matthias Heinrichs, Olaf Hellwich*, Berlin University



	<p>of Technology, Germany</p> <p><b>Updating Algorithms for Constraint Delaunay TIN</b> <i>LiXin WU, YanBing WANG</i>, China Univeristy of Mining &amp; Technology, China</p> <p><b>Precision Analysis to 3D Reconstruction from Image Sequences</b> <i>Min SUN, Rixin HE, Daojun WANG</i>, Peking University, China</p>
14:10-15:30	Lunch (Market Fresh Grand Café in Hongfu Hotel, Ticket Required)
15:30-17:10	<p><b>Technical Session 5: Image classification and analysis</b> (Silver Wing Ballroom No.2) Chair: Qiming ZHOU</p> <p><b>change detection based on spatial data mining</b> <i>Deren LI, Song XIA, Haigang SUI, Xiaodong ZHANG</i>, Wuhan University, China</p> <p><b>Physical Barrier Detection for Updating of Navigation Databases from High Resolution Satellite Imagery</b> <i>Li MA, Anne Grote, Christian Heipke, Jun CHEN, Jie JIANG</i>, National Geomatics Center of China, China</p> <p><b>Fusion of MODIS and Radarsat data for crop type classification — an initial study</b> <i>G. HONG, Y. ZHANG, A. ZHANG, F. ZHOU, J. LI</i>, University of New Brunswick, Canada</p> <p><b>Gaussian mixture model of texture for extracting residential area from high-resolution remotely sensed imagery</b> <i>Juan GU, Jun CHEN, Qiming ZHOU, Hongwei ZHANG</i>, National Geomatics Center of China, China</p> <p><b>Comparison of pixel-based and object-oriented classification methods for extracting built-up areas in aridzone</b> <i>Jing QIAN, Qiming ZHOU, Quan HOU</i>, Hong Kong Baptist University, China.</p> <p><b>Fast Flooding Information Extraction in Emergency Response of Flood Disaster</b> <i>Zhuowei HU, Huili GONG, Liying ZHU</i>, Capital Normal University, China</p> <p><b>Technical Session 6: Update of geo-databases</b> (Silver Wing Ballroom No.3) Chair: Min SUN</p> <p><b>Event-driven Incremental Updating of Cadastral Spatial Database considering topological integrity</b> <i>Jun CHEN, Xiaoguang ZHOU, Zhilin LI</i>, National Geomatics Center of China, China</p> <p><b>Quality Detection and Control for Paper Chart Production &amp; Updating Based on Standard Quality Database</b> <i>Haigang SUI, Xiaoming LI, Zheng LY, Anmin ZHANG</i>, Wuhan University, China</p> <p><b>An Updating Method of Geospatial Data based on Traffic Flow Analysis</b> <i>Y. H. ZENG, Z.H. TIAN, J.M. HUANG, S.S. CHEN, K.W. ZHONG</i>, Gungzhou Institute of Geography, China</p> <p><b>Change-only modeling in Navigation geo-databases</b> <i>Shen YING, Lin LI, Xiaofei LIU, Hu ZHAO, Dan LI</i>, Wuhan University, China</p> <p><b>Generic framework and key issues for updates propagation between heterogeneous spatial databases</b> <i>Yuhong WANG, Jun CHEN</i>, National Geomatics Center of China, China</p>
17:10-17:30	Tea Break
17:30-19:10	<p><b>Technical Session 7: Geo-information Management &amp; application</b> (Silver Wing Ballroom No.2) Chair: Lixin WU</p> <p><b>Research and implementation of catalog system on the construction of the government information catalog architecture</b> <i>Hu WANG, Yiding WU, Xu YANG</i>, Peking University, China</p> <p><b>The subdivision of partial geo-grid based on global geo-grid frame</b> <i>Xiaochong TONG, Jin BEN, Song Ji, Yongsheng ZHANG</i>, Zhengzhou Institute of Surveying and Mapping, China</p> <p><b>On 3D GIS Spatial Modeling</b> <i>Yanbing WANG, Lixin WU, Wenzhong SHI, Xiaomeng LIU</i>, Capital Normal University, China</p> <p><b>Linking Multi-Scale Representations in A Navigable Database</b> <i>Xiaomeng LIU, Yanhui WANG, Hao MENG</i>, Capital Normal University, China</p>

**Spatial Data Sharing and Interoperability Based on Web Spatial Data Service and GML**  
*Feng WANG, Yunfei SHI, Xuguang QIN, Huan ZHANG*, Liaoning Province Geomatics Center,  
China

**Spatial Multi-cadastral Information and the Technique of the Implementation of the System**  
*Zhanliang YUAN, Aiguo LI, Ziping ZHANG*, Henan Polytechnic University, China

19:10-19:30	<b>Closing Ceremony</b> (Silver Wing Ballroom No.2)
20:00-22:00	Supper (Market Fresh Grand Café in Hongfu Hotel, Ticket Required)