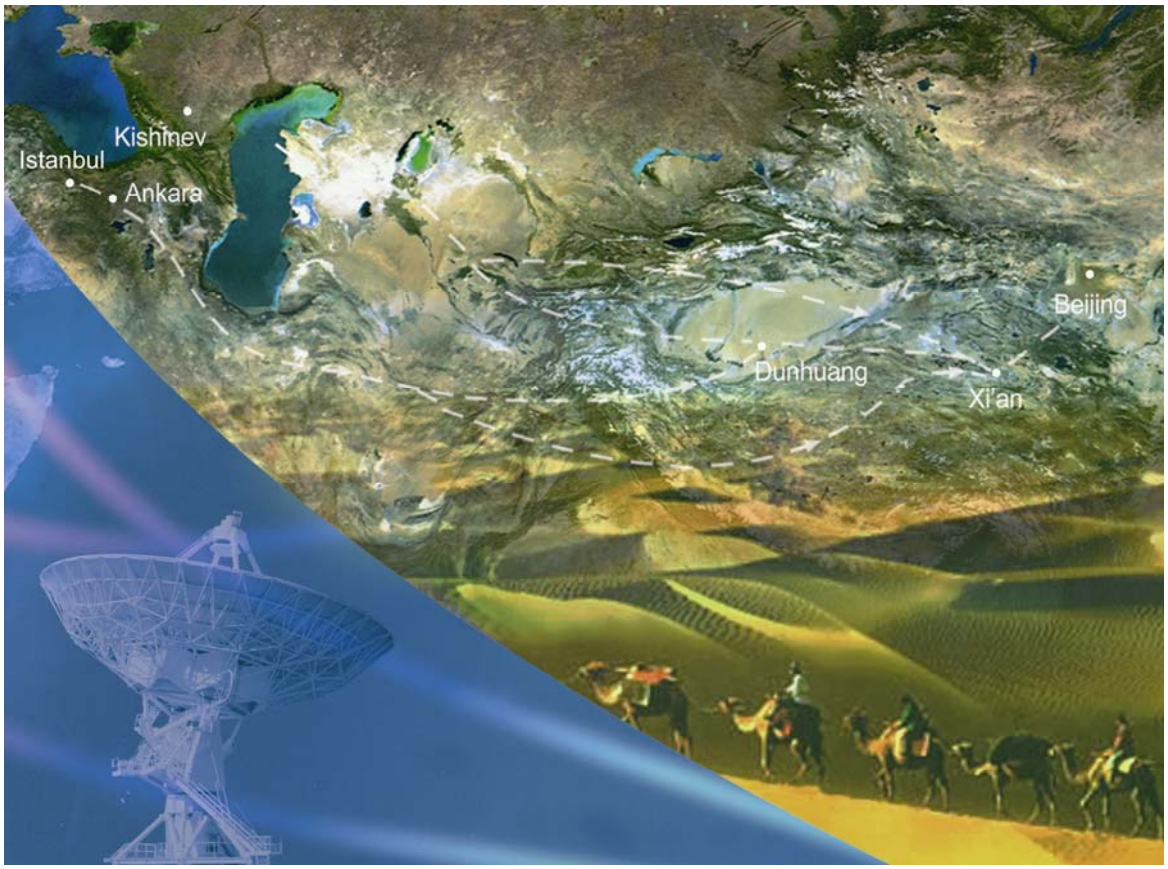
International Society for Photogrammetry and Remote Sensing
Société Internationale de Photogrammétrie et de Télédétection
Internationale Gesellschaft für Photogrammetrie und Fernerkundung

ISSN 1682-1750

THE INTERNATIONAL ARCHIVES OF THE PHOTOGRAMMETRY, REMOTE SENSING AND SPATIAL INFORMATION SCIENCES
ARCHIVES INTERNATIONALES DE PHOTOGRAMMÉTRIE, DE TÉLÉDÉTECTION ET DE SCIENCES DE L'INFORMATION SPATIALE
INTERNATIONALES ARCHIV FÜR PHOTOGRAMMETRIE, FERNERKUNDUNG UND RAUMBEZOGENE INFORMATIONSWISSENSCHAFTEN

PROCEEDINGS

VOLUME / VOLUME / BAND XXXVII
PART / TOME / TEIL B4
COMMISSION / COMMISSION / KOMMISSION IV



Edited by:
CHEN Jun, JIANG Jie, Shailesh NAYAK

Published by the Organising Committee of the XXI International Congress for Photogrammetry and Remote Sensing
Publié par le Comité d'Organisation de XXI Congrés Internationale de Photogrammétrie et de Télédétection
Herausgegeben vom Organsationskomitee für den XXI Internationalen Kongress für Photogrammetrie und Fernerkundung

Copies of this book/CDROM are available from:

Reed Business - Geo (former GITC) by
P.O.Box 112
8530 AC Lemmer
The Netherlands
Tel: +31 (0) 514 56 18 54
Fax: +31 (0) 514 56 38 98
E-mail: geo@reedbusiness.nl
http://www.reedbusiness-geo.nl

ISPRS Council 2004-2008

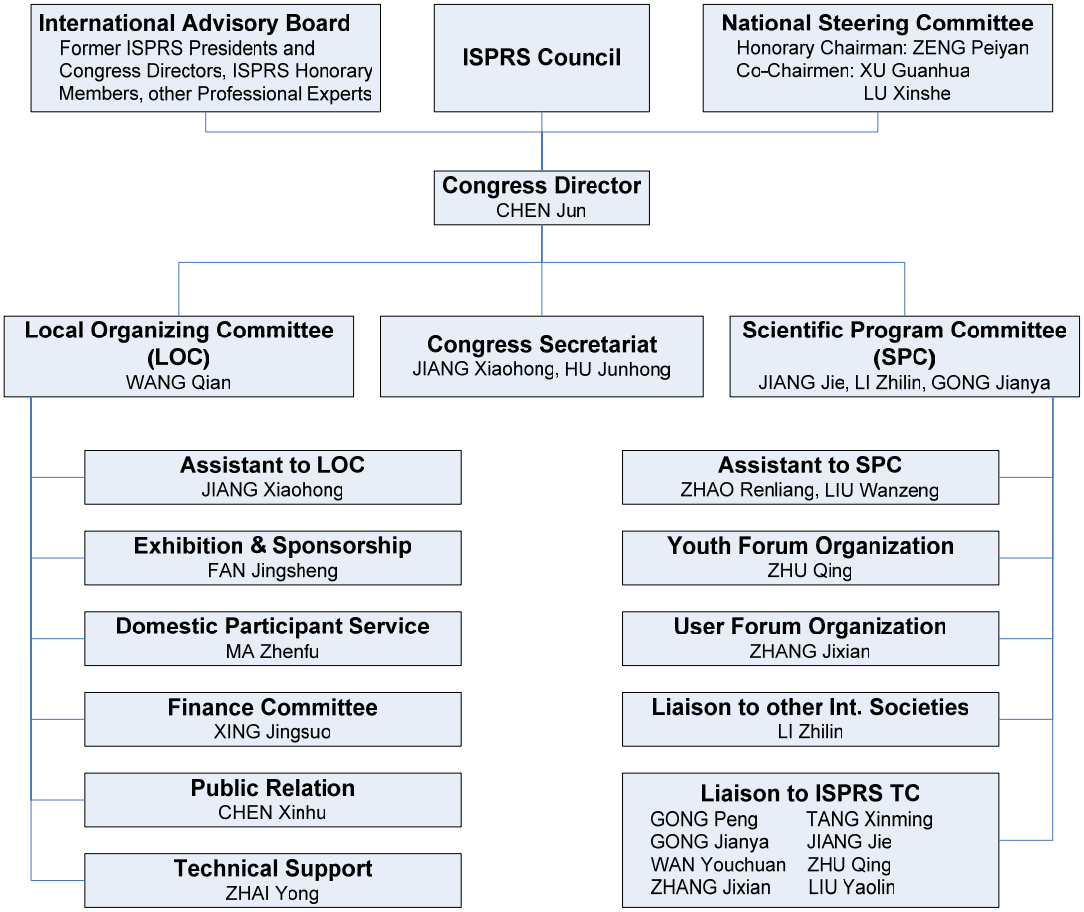
President	Ian Dowman	United Kingdom
Secretary General	Orhan Altan	Turkey
Congress Director	Chen Jun	P. R. China
First Vice President	John Trinder	Australia
Second Vice President	Emmanuel Baltsavias	Switzerland
Treasurer	Stanley Morain	USA

Technical Commission Presidents 2004-2008

Commission I	Alain Baudoin	France
Commission II	Wolfgang Kainz	Austria
Commission III	Wolfgang Foerstner	Germany
Commission IV	Shailesh Nayak	India
Commission V	Hans-Gerd Maas	Germany
Commission VI	Kohei Cho	Japan
Commission VII	John van Genderen	The Netherlands
Commission VIII	Ammatzia Peled	Israel

In cooperation with Working Group Chairpersons responsible for the reviewing of extended Abstracts and acceptance of contributions. Authors delivered camera ready manuscripts and selected the keywords.

Congress Organising Committee



Introduction

The most effective means of depicting events over space and time is through spatial data. The value of representing information in form of a map has been realised since the beginning of civilisation. The transition of representation of information from historical artistic depiction to complex digital formats has been due to tremendous progress made in acquisition of data through remote sensing, organisation of databases around Geographic Information System (GIS) and Global Positioning System (GPS). The advances in computer, database and communication technologies, and digital cartography has facilitated emergence of geo-databases and digital mapping.

During last four years, significant development has taken place in spatial data infrastructure. Databases of various types have been produced at national, regional and global levels. The focus is on acquisition of stereo images for 3D analysis. The recent availability of high-resolution orbital data (CARTOSAT 1 & 2, TerraSAR-X) has provided unique opportunity to carry out research in automatic image interpretation and object extraction. The emphasis is clearly on automatic updating of databases. The improvement in positional accuracy needs to be addressed. The image-based spatio-temporal data has been receiving increasing attention especially related to content-based indexing, querying, data mining, in information retrieval. The development in algorithms for management of geo-sensor networks is continuing and likely will see further improvement.

The advancement in visualisation allows virtual displays of landscape in great detail, from a global scale of world-wide processes to fine scale views of cities and buildings. Visualisation techniques are used to interactively explore spatial structures and processes, create virtual realities, demonstrate human impact on landscapes, etc. The 3D visualisation capability has significant impact on society.

Continuous development of various web-based GIS services and applications have substantially increased and enhanced the use of GIS in spatial data access and dissemination, exploration, visualisation, processing, analysis and modelling. Grid computing continues to be an active research subject in Web GIS as it manages massive distributed computing/storage resources and improves performance. Open-source software has provided new, cost-effective solution to web-based geospatial information and service. The concept of virtual Globe is very important for the future development of Web GIS. Location-based services enable wired and wireless users to integrate geospatial information developing a solution. The development of open standards and the interoperability will facilitate enormous potential for sharing scientific data with common standards for providing web-based and location based services, to the variety of users.

The application of such databases and development of services for societal benefit is critical. The geospatial technology is a key for response to a disaster or a emergency. The setting of warning centres, especially for tsunami, has been around geospatial technology for acquisition of data from variety of platforms, organisation into a data base, representation and visualisation of data/information, analysis, modelling and dissemination of advisories including generating hazard or risk maps. The collection and analysis of data including 3D within first hours to few days and its integration with existing data is crucial for rescue and relief operations.

A number of missions are on way to explore the resources on our solar system. The data supplied by these missions will open a new chapter in mapping of extra-terrestrial systems and creating spatial databases, and web based access. The spatial information systems for planetary system are being built. The interest in Lunar mapping research is increasing (SELENE, LRO, Chandrayan-1). Digital terrain products are likely to be available shortly to construct Lunat topographic model. Various approaches are being investigated to produce high resolution DTMs from HRSC (MEX) and HiRISE (MRO) to generate geodetically controlled digital topographic models for Mars. Cassini spacecraft provided data to produce atlases of icy satellites of Saturn.

The Proceedings are culmination four years of research carried out by all working groups of the Commission. It reflects the current state of knowledge in the field of geospatial technology and applications. I am sure the Proceedings will be very useful to all researchers in this field.

I also take an opportunity to thank all my colleagues in the Commission, my fellow presidents and the council for their support and guidance during last four years.

Shailesh Nayak
President of ISPRS Technical Commission IV

Table of Contents

WG IV/1: Spatial Data Infrastructure

WG IV/2: Image-Based Geo-Spatial Information Management

WG IV/3 Automated Geo-Spatial Data Acquisition and Mapping

WG IV/4 Landscape Modeling and Visualisation

WG IV/5 Web-Based Geo-Information Services and Applications

WG IV/6 & ThS 8 Location Based services

WG IV/7 Extraterrestrial Mapping

WG IV/8 Spatial Data Integration for Emergency Services

WG IV/9 Mapping from High Resolution Data

Theme Session: Realtime and Incremental Updating of Core Databases

Theme Session: Lunar Exploratory Missions

Theme Session: Early Warning Systems for Natural Hazards

Special Session: Spatial Data Infrastructure (SDI) and Spatial Information Grid (SIG)

Special Session: Geo-Information for Disaster Mapping

Special Session: from National Mapping to an European Spatial Data Infrastructure

Special Session: Standards and Standardization of Geo-Spatial Information

Special Session: Digital Olympics

Special Session: Western Area Mapping and 1:50000 Database Updating in China with High Resolution Imagery

Special Session: Global DEM Interoperability