Editorial

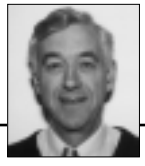
The year 2001 will be one to remember for all members of ISPRS. The 11 September terrorist attacks in New York and Washington have shaken the sense of security of many individuals who undertake travel to fulfil their international responsibilities for their employer, company, international scientific organisation, or for their own personal scientific or commercial interests. September 2001 was an important month for conferences of organisations with which ISPRS is associated. Therefore, it so happened that ISPRS Council was meeting in London during the week of September 11. Subsequently, I travelled to the CIPA conference in Potsdam, Germany, the workshop on High Resolution Mapping from Space 2001 in Hanover Germany, the Photogrammetric Week in Stuttgart, Germany, and the Conference of the Brazilian Society of Cartography in Porto Alegre, Brazil. I am happy to say that there was little impact of the terrorist attacks on the attendance at these meetings, and the vast majority of speakers and intended participants were able to attend these conferences. It is hoped that this commitment to attend international scientific meetings will continue throughout 2002, for the ISPRS Technical Commission Symposia. Immediately following the September 11 attacks, ISPRS Council sent a letter of condolence to the American Society for Photogrammetry and Remote Sensing (ASPRS), expressing its support for the Society, and its concern for the welfare of its members, as well as all US citizens.

The publication of ISPRS Highlights commenced in 1996 following the Vienna Congress. The March 2002 edition is therefore the commencement of the seventh volume of its publication, containing the 2002 Annual Report. Council continues to strive to improve the quality and content of ISPRS Highlights, with news and information about ISPRS, news on developments in the photogrammetry, remote sensing and spatial information sciences, a calendar of events and many other details of interest to members. The publication is distributed at no cost to members and individuals associated with ISPRS. The Secretary General is compiling a list of addresses of individuals who should receive a copy. He should be contacted by those people who wish to be placed on the list of addresses of recipients. Council expresses its appreciation to everyone who has contributed to the success of ISPRS Highlights since its introduction in 1996, and especially GITC bv in The Netherlands which has been the publisher and a strong supporter since 1998.

ISPRS Highlights is one of three official regular publications of ISPRS, the others being the ISPRS International Journal of Photogrammetry and Remote Sensing, and the International Archives of Photogrammetry and Remote Sensing. The ISPRS Journal has developed some scheduling problems in 2001, as reported in this Annual Report and on the ISPRS Home Page, but Council is working to resolve these problems as quickly as possible. In addition to the above publications, the 'ISPRS Organization and Programs 2000-2004' (Silver Book) was published in early 2001. The annual 'ISPRS Member List' (Blue Book) was suspended in 2001 while a completely new database was developed to improve communications with members. As a consequence, a new look Blue Book based on the database will be available in early 2002. The ISPRS Home Page [www.ISPRS.org] includes details of all of these publications. Council is currently investigating the possibilities of publishing an ISPRS Book Series that will include high quality peer-reviewed papers based on those given at ISPRS Congresses, Symposia and workshops. A decision will be made when and if a suitable publisher can be found to finance the Series.

This Annual Report is important, as it reviews the first full year of progress of ISPRS science and technologies in the seven Technical Commissions since the last Congress, and as well sets the scene for the Symposia, which will be held from July to December 2002. Despite only being formalised in early 2001, the past year has been a strong one for many of the Working Groups in ISPRS. You will find details of their progress in this edition. A number of workshops have been held in various parts of the world, and the organisers have done an excellent job in producing four new volumes to the ISPRS International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences that are, or will be available shortly. The topics of the new volumes are based on the following workshops: 'recreating the past - visualisation and animation of cultural heritage', in Ayutthaya Thailand in February-March 2001; 'dynamic and multi-dimension GIS', in Thailand in May 2001;'land surface mapping and characterisation using laser altimetry', in USA in October 2001; and 'challenges in geospatial analysis, integration and visualisation', in USA in October 2001. The Archives volumes are now being sold through a new distributor, GITC bv, in The Netherlands.

During 2001, as well as visiting a number of international organisations and local and regional meetings, I represent ISPRS at meetings of international organisations with which ISPRS has contact or is establishing contact, including: the UN Regional Cartographic Conference for the Americas in New York, USA; the S&T Committee of COPUOS and the full Committee of COPUOS (Committee for the Peaceful Uses of Outer Space) in Vienna; OICC (Organisation of Islamic Capitals and Cities) 7th International Seminar on Sustainable Development in



Cairo, Egypt; a meeting of the Joint Board of Spatial Information Societies during the IAG Scientific Assembly in Budapest, Hungary; and CODI-2 (Committee on Development of Information in Africa) in Addis Ababa, Ethiopia. This sample of organisations with which ISPRS has contact demonstrates the recognition and impact that ISPRS is making around the world in the photogrammetry, remote sensing and spatial information sciences.

I commend this Annual Report to you. I wish all members and individuals associated with ISPRS a productive and prosperous 2002 and Council looks forward to seeing many of you at the ISPRS Symposia.

John Trinder
President

Annual Report 2001

Introduction

I am pleased to present the ISPRS Annual Report for the year 2001. The report is compiled from contributions from many people who are actively involved in the activities of ISPRS. It contains reports from the Congress Director, Treasurer and the editors of our publications, and most importantly reports from the Commissions written by the TCPs and Working group Chairs. Their reports allows everyone who reads this document to see the large amount of work going on within the Commissions and Working Groups and gives an indication of events being planned. The annual report also gives Council an overview of Working Group activity. The report also includes contributions from Regional Members and on ISPRS participation in the work of other international organisations. Council is very grateful for the effort put in by all contributors so that all members and other interested individuals can see the wide scope of ISPRS activity.

The Annual Report does not include a report on Council activities. An overview of the topics of concern to Council and the activities of Council members can be found in the reports of the Council meetings which are published in Highlights in June and December. These can also be found on the ISPRS web-site. The Annual Report should be seen as complementary to the web-site, which gives a full picture of ISPRS activity with up to date information on events.

Ian Dowman
ISPRS Secretary General

Technical Commission Reports

ISPRS TECHNICAL COMMISSION I
SENSORS, PLATFORMS AND IMAGERY

President: Stanley Morain (USA)
Scientific Secretary: Amy Budge (USA)

State of Science and Technology of Commission Topics

2001 has seen major advances on all fronts addressed by the Commission. The importance of 1-meter commercial satellite imagery has attracted massive and widespread interest among government agencies, academia, and private interests, worldwide, for map updating, DEM production, and resource analyses. TC-I reported on one of the calibration/validation conferences (Highlights, June, '01). In October, DigitalGlobe, Inc. launched its QuickBird successfully, and has received its first engineering-level images having 0.6-m horizontal resolution.

As of November 28, there were 52 launches in 2001. Four of these have direct interest to TC-I as Earth Observing Satellites. Of these four, Orbital Science's platform called Taurus carrying their Orbview-4 and NASA's QuikTOMS failed to reach orbit. The three successful launches were Russia's Start-1 (Feb. 20), QuickBird (Oct. 18), and three sensors onboard the PSLV-C3: ISRO's TES, Germany's BIRD, and Belgium's PROBA (Oct. 22). One replacement GPS satellite was launched on January 30.

Radiometric and Geometric calibration efforts have moved forward with the development of a Joint CEOS/ISPRS task force on radiometric and geometric Standards. A profile of this task force has been adopted by CEOS and ISPRS, and the task force is currently being formed. Pending approval, Dr. Rainer Sandau (DLR) has agreed to serve as Chair of the task force

Accomplishments of the Commission

The period since Amsterdam has been very busy. In October 2000, the Commission hosted Council in Albuquerque for its first Joint Council/TCP meeting of the 2000-2004 Congress period. This was followed by considerable effort to develop WG terms of reference and approving Working Group Chairs, Co-Chairs and Secretaries. While these efforts were on-going, several other Commission activities took place:

- Developed the Commission website www.commission1.isprs.org
- Drafted a profile of the Joint CEOS/ISPRS Task Force on Radiometic and Geometric Standards and provided input to the CEOS WGCV work plan for 2000-2002;
- Provided comments and observations to ISPRS President John Trinder for an official ISPRS response to the draft Landsat Continuity Mission (LDCM) procurement document;
- Represented the Commission and presented an opening address at the joint WGI/4, WGI/5, WGII/IV session at 2001 Annual ASPRS Conference in St. Louis. The one-day event was titled From Imagery to Geodata. Also conducted the first Commission-I business meeting at which all working groups were represented.
- Attended the High Spatial Resolution Commercial Imagery Workshop sponsored by NASA, NIMA, USGS, and Space Imaging, Inc., and contributed a synopsis of major finding to ISPRS Highlights (June 2001 issue);
- Arranged for two attendees to the Global Precipitation Measurement Planning Workshop to represent ISPRS. A synopsis was prepared for Highlights but not published.
- Assisted WGI/4 chairman, Dr. Shimada Masanobu in preparing a synopsis of the CEOS SAR Cal/Val Conference for publication in ISPRS Highlights.
- With the Commission Secretary, and in association with the joint ISPRS/Pecora-15 steering committee, developed a preliminary agenda, announcement and call for presentations for the Commission's mid-term symposium;
- Agreed to work with the organisers of ISPRS Commissions –II and –VII to have joint technical sessions with their mid-term symposia in Xi'an (August) and Hyderabad (December).

Working Group Activities during the Current Year

WG I/1: DEFINE STANDARDS FOR SENSOR PARAMETERS

Chair: Charles Mondello (USA)
Co-Chair: John C. Baker (USA)

Accomplishments of the Working Group

- A committee on Direct Georeferencing has been formed within Working Group 1. Chaired by Mohamed Mostafa (Applanix Corp., Canada) the committee has 29 members.
- Leadership of NASA 10 Year Industry forecast projecting future directions w/in the geospatial industry
- Creation and Definition of the Digital Aerial Guideline who's goal is a guidance document for data collection using digital airborne sensors
- Contributed keywords for the ISPRS Archives

WG I/2: SENSOR CALIBRATION AND TESTING

Chair: Manfred Schroeder (Germany)
Co-Chair: Veljko M. Jovanovic (USA)

State of Science and Technology of Working Group Topics

Photogrammetric users have obtained first experiences with high-resolution space images in the last two years. As no calibration data for the corresponding space cameras are available from the satellite operators (e.g. for IKONOS), calibration methods using ground control and modelling of the imaging geometry are of special interest for the user community. Papers on this subject have been presented.

Commercial photogrammetric digital airborne cameras coupled with high precision navigation systems appeared on the market for the first time at the Amsterdam Congress. Calibration and orientation of this sensor type, as well as georeferencing of its data, is a new research field for photogrammetrists. Results of first test flights have been presented at workshops.

Radiometric calibration of multispectral space sensors, especially wide field sensors, and investigations on long-term radiometric stability of these sensors need further investigations; onboard- and vicarious calibration methods should be applied. Joint research activities with CEOS WGCV have to be strengthened.

Accomplishments of the Working Group

The main activity was the High Resolution Mapping from Space 2001 workshop held September 19-21, 2001 in Hanover, Germany. The workshop was a joint effort between WG I/2, I/5, and IV/7. Approximately 80-100 participants attended the workshop. A report was published in Highlights Vol.6 No.4.

Contacts have been established with CEOS WGCV. Yves-Louis Desnos, chair of this working group attended the workshop and give a presentation on the activities of the CEOS WGCV.

WG I/3: ACTIVE SENSOR SYSTEMS

Chair: Mike Renslow (USA)
Co-Chair: Mike Palmer (UK)

State of Science and Technology of Working Group Topics

System manufactures and operators of active sensor systems are making significant progress. A conventional LIDAR system collects data at 25 to 33 kHz, and systems are coming on-line at 50 kHz. Most LIDAR systems now have the capability to capture reflection intensity values in addition to the ranged coordinate data, which delivers an interpretable image file to compliment the LIDAR surface data. Refinements in system calibration and validation procedures for SAR and INSAR systems is resulting in vertical RMSE values of below 50-cm for X-Band, and 1-meter for P-Band verifying system performance on clear-hit targets. Using LIDAR as a calibration/validation data set for INSAR applications is in the evaluation process.

Accomplishments of the Working Group

Working Group 3 is just now getting fully organised. Currently, there are 15 members in the working group. The plan is to have two major committees, one for LIDAR systems (chaired by Renslow) and one for RADAR systems (chaired by Palmer). Within each committee it is anticipated that there will be sub-committees to address specific topical areas, such as hardware, data recording and processing, test sites and validation, and processing algorithms. Positive support has been received for the LIDAR activities, and it is anticipated that there will be similar interest for RADAR.
Working Group I/3 organised and presented two ISPRS technical sessions at the Annual ASPRS Conference, April 2001, in St. Louis, MO USA. They have also organised a technical session on LIDAR for the ICORSE Conference that will be in Buenos Aires in April 2002. In addition, ISPRS Commission I activities have been included in ASPRS workshops, and participants of these workshops have been invited to participate in the Commission.

Other planned activities for the Working Group are:
- Collaborating with other Commission I WGs and WG III/3 and WG III/6;
- Developing workshop, technical sessions, and business meeting for Mid-Term Symposium; and
- Conducting a workshop to be held in Portland, OR USA in fall 2003.

A new symposium focusing on LIDAR and INSAR technology, calibration, data processing, and validation is being developed for the joint ISPRS/Pecora 15 conference in November 2002.

Working Group News and Future Plans

Joint collaboration is underway between ASPRS to develop guidelines for LIDAR data collection; the workgroup chair prepared the first draft of the guidelines. The next meeting is scheduled for Feb. 4, 2002.

WG I/4: ADVANCED SENSOR SYSTEMS

Chair: Masanobu Shimada (Japan)
Co-Chair: Janio Kono (Brazil)

Accomplishments of the Working Group

Working Group 4 has a sub-group that is interacting with the CEOS SAR CAL/VAL group. The membership of the working group numbers about 66. A four-day meeting at EORC NASDA was held April 2-5, 2001. There were almost 60 participants from 13 countries. Sixty-six presentations and 17 posters were given in 7 sessions covering Interferometry, Polarimetry, Radiometric and Geometric Calibration, New Instrumentation, Applications (forest, ocean, and ship detection), ALOS, and ENVISAT. Each session consisted of presentations, questions, and a round-table. The workshop covered the updated topics on the SAR CAL/VAL. The first three days and the morning of the fourth day were spent on the regular sessions. The last half-day was dedicated to a plenary session where the chair and co-chair prepared summaries and recommendations for each session. An overall summary of the meeting will be prepared and forwarded to the CEOS CAL/VAL meeting in ESRIN. A report was prepared and submitted to Highlights.

A CEOS SAR CAL/VAL workshop is planned for the end of September 2002 in the UK (most likely Farnborough).

Working Group News and Future Plans

On December 10, Commission President (Morain) and Technical Secretary (Budge) met with the principal organisers of the Future Intelligent Earth Observing Satellite (FIEOS) Conference scheduled for April 2002 in Washington, D.C. It is tentatively agreed that this meeting will be re-scheduled to become an I/4 activity at the Commission-I mid-term symposium in Denver next November. I/4 Secretary (Raad Saleh) has been briefed and will assist in preparations for converging the FIEOS Conference with I/4.

WG I/5: PLATFORM AND SENSOR INTEGRATION

Chair: Karsten Jacobsen (Germany)
Co-Chair: Ismael Colomina (Spain)

Accomplishments of the Working Group

Much of Working Group 5's energy focused on planning the High Resolution Mapping from Space 2001 workshop hosted by the Institute for Photogrammetry and GeoInformation at the University of Hannover, September 19-21, 2001. This was a joint workshop with WG I/2 and WG IV/7. The workshop was the first meeting of WG I/5 giving the working group an opportunity to discuss further activities. The program had 39 presentations, including those by the ISPRS President and Secretary General.

The working group also contributed to the OEEPE Workshop, Integrated Sensor Orientation, which took place September 17-18, also at the University of Hannover.

Working Group News and Future Plans

Future plans include collaboration with the ASPRS DG Committee for a workshop on Direct Georeferencing

that will be held at the ASPRS 2002 spring meeting, and a workshop that will be held in Barcelona, Spain in 2003.

WG I/6: AIRBORNE OPTICAL SENSOR SYSTEMS

Chair: Brian Huberty (USA)
Co-Chair: Brian Gorin (USA)

State of Science and Technology of Working Group Topics

Airborne digital mapping cameras continue to grow in number, array sizes, and sophistication. 9000 x 9000 pixel array cameras are available from BAE as well as near real-time, multi-spectral, terrain corrected images from Airborne Data Systems cameras. In aerial film camera news, Kodak has come out with a new and improved colour infrared film - 1443. The working group will be working on developing guidelines for acquiring film and digital airborne images.

Accomplishments of the Working Group

Working Group I/6 consists of eight members and four committees. The committees and their chairs are:

- Compendium of Remote Sensing Sensors, led by Herbert Kramer (DLR). This committee focuses on the 4th edition of Dr. Kramer's publication, which is currently being printed.
- Digital Aerial Camera Standards, led by Ron Ondrejka (Consultant) in coordinations with ASPRS PDAD. This committee has been ongoing for three years and is dealing with some tough issues.
- Portable Briefcase Small Format Digital Aerial Systems Global Use, led by Robert Brock (Aerial Image Technology). This is a new committee and is still developing its agenda.
- Multispectral (Optical and Thermal) Systems for Real-Time Aerial Fire Mapping, led by Dave Fuhr (Airborne Data Systems).

Other accomplishments include:

- Call for papers for the Mid-term - conference will be going out January 2002.
- Draft digital airborne camera acquisition guidelines have been developed and discussed at the fall 2002 ASPRS meeting in Florida.
- Actively working on the 9K mapping system issues for BAE, and examining the digital vs. film tradeoffs for large format mapping systems.
- Thinking about an equivalent metric to AWAR for digital mapping cameras, which is independent of altitude and ground sampling distance, but which incorporates SNR and MTF effects across the FOV and therefore across the image plane. We have also been exploring measurement of "interior" calibration coefficients for the large format digital systems, and the lack thereof for the calibration resource at USGS.
- Contributed keywords for the ISPRS Archives

Working Group News and Future Plans

The Airborne Optical Sensor Systems WG will be meeting twice before the November 2002 Mid-Term Conference in Denver. We will first meet in conjunction with the Primary Data Acquisition Division meeting at the annual American Society for Photogrammetry and Remote Sensing; April 22-26, 2002. We will also meet May 22-24 at the newly rescheduled Veridian 5th Airborne Conference; Miami, Florida. At both the ASPRS and Veridian conferences, we will be building up the fall Mid-term sessions as well as working on the guidelines for acquiring airborne images.

Future plans are to participate in the Airborne Sensors sessions at the ERIM Veridian 5th International Airborne Conference September 17th in San Francisco, CA USA; and to contribute to the ASPRS Primary Data Acquisition Division meeting and technical sessions at the ASPRS 2002 meeting in Washington, DC USA.

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TECHNICAL COMMISSION II
INTEGRATED SYSTEM FOR SPATIAL DATA PRODUCTION, CUSTODIAN AND DECISION SUPPORT

President: Jun CHEN (China)
Scientific Secretary: Jie JIANG (China)

State of Science and Technology of Commission Topics

In the year 2001, great efforts have been made by WGs of technical commission II and significant achievements have been gained.

WG II/1 carries on their work on real-time mapping technologies. During the year 2001, the speed of Mobile Multi-Sensor Systems (MMS) technological development is still very rapid. Building a mobile mapping system by integrating off-the-shelf hardware and software components is getting easier, but it still requires significant courage, investment and efforts. Real-time mapping technologies are being applied to various applications. The continuing development of MMS is stimulating the development of intelligent processing techniques and new areas of application. More efforts should still to be made in order to achieve the same level of ground position accuracy as traditional aerial triangulation and we can expect major contributions toward the perfection and popularity of the technology in years to come.

WG II/2 is a newly-formed WG entitled "Systems for SAR and Lidar processing", established with the intention of combining interests and applications of the SAR and Lidar communities, with emphasis on the areas of commonality such as DEM generation. The focus to date has been on interferometric SAR (InSAR) and on scanning, small-footprint Lidar. Both the Lidar and InSAR fields are seeing dramatic growth in interest, development and use. At this time over 60 systems are believed to exist world-wide and the number is increasing. On the InSAR side, the systems are also improving, particularly with respect to vertical accuracy, where sub-meter (RMSE) vertical results have been demonstrated in many areas. Perhaps the major problem being addressed currently is how to obtain bare-earth under various conditions. A great deal of development effort is currently focused on the potential of longer-wavelength, multi-polarization InSAR. Over the next year there should be additional data and experience available against which to gauge the level of success of these endeavours

WG II/3 works on "Integrated systems for information services". The geo-database is often the first level in a hierarchy of data comprising geo-related, administrative, environmental or utility information, so the demands on update and completeness of geo-data are high. There is focus on the interoperability between public and private databases, Internet based distribution systems and the necessary standards for data exchange.

The integration of geo-data and imagery are of special importance for the purpose of revision and updating, which depends on to a large degree the establishment of image data standard and material developments have been reached. For "Image Data Standards", WG II/4 have some co-operation with ISO/TC211 and OGC. They participate the development of the ISO 19129 on "Imagery, gridded and coverage data framework" and ISO 19130 on "Sensor and data model for imagery and gridded data". WG II/4 has also had regular information exchange with OGC.

"Design and operation of spatial decision support systems" is the topic of WG II/5. Spatial decision-making based on a combination of image-based and vector data is an important activity in many application domains. The support of decision making with knowledge-based techniques (rule-based systems) and artificial neural networks has found many useful applications reported in the literature. We observe an increased interest in combining standard GIS functionality with novel approaches taken from fuzzy logic and artificial neural network technology. The co-operation of producers of spatial decision support systems and users of these systems is increasingly recognised as an approach to provide better spatial decision support to real world problems.

WG II/6 works on "Spatial analysis and visualisation systems". They co-organised the DMGIS'2001 workshop with other WGs and nominated a new co-chair: Prof. Kraak from ITC. During 2001, the trends in interactive hypermedia cartography towards on-line contents and dynamic 3D visualisations have been highlighted, designing a spatial image-based decision support system for solving user's specific problems is another development direction.

The inter commission working group ICWG II/IV works on "Systems for automated geo-spatial data production and updating from imagery". There are many scientific groups doing research in automatic cartographic feature acquisition. One focus is on capturing of 3d objects. Automatic Aerial Triangulation and DEM generation have reached a point where it became a standard component of a photogrammetric systems. Concerning the automation of cartographic feature extraction the transition of experimental systems into practical solutions is very low. Concerning updating of GIS, besides the data capture itself the management of the updating information in the database is a relevant topic itself. Automatic update including topological changes still is nearly unsolved. Digital photogrammetric workstations more and more approach a GIS leading to integrated solutions which cover the complete process from data capture to data management, analysis, visualisation and dissemination. At present they

are incorporating database and visualisation functionalities, partly even in 3d.

Accomplishments of the Commission

There have been a number of important working group meetings during 2001 which are detailed in the WG reports. Of particular note are:

- The establishment of web-sites by Commission II and each its working groups.
- Close co-operation with OEEPE, CEOS, ISOTC211, ICORSE, ICA, ASPRS and other international academic organisations.
- A resource library is under construction by WG II/3.

Working Group Activities during the Current Year

WG II/I: REAL-TIME MAPPING TECHNOLOGIES

Chair: Rongxing (Ron) Li (USA)
Co-Chair: Norbert Haala (Germany)

State of Science and Technology of Working Group Topics

It is very clear that building a mobile mapping system by integrating off-the-shelf hardware and software components is getting easier, but it still requires significant courage, investment and efforts. The "dream" is to achieve the same level of ground position accuracy as traditional aerial triangulation.

Some new systems have been developed or are under development: a helicopter-based, portable, handheld MMS for avalanche mapping developed by the Photogrammetric Lab of the Institute of Geomatics at the Swiss Federal Institute of Technology; a portable personal MMS for the surveying community developed by the Department of Geomatics Engineering at the University of Calgary; ALMIMS (Airborne Laser-ranging and Multi-spectral Imaging Mapping System), a multi-sensor mapping system developed by the Institute of Remote Sensing Applications of the Chinese Academy of Sciences, and DORIS (Differential Ortho-Rectification Imagery System), an airborne multi-sensor mapping system that has been under development for years at the Alberta Research Council. This is, of course, not a complete list.

Real-time mapping technologies are being applied in various applications: automatic bald digital terrain model reconstruction using airborne SAR, automatic generation of hierarchical DEM for Mars Rover navigation, integrating data from terrestrial mobile mapping systems and aerial imagery for change detection purposes, integrating photogrammetric data from mobile ship-borne and airborne systems for support of conservation processes and environmental analysis, automatic building extraction from airborne laser systems, and integration of mobile phone location services into intelligent GPS vehicle navigation systems.

The continuing development of Mobile Multi-Sensor Systems (MMS) is stimulating the development of intelligent processing techniques and new areas of application. Emerging processing techniques include: motion estimation by vision for mobile mapping with a motorcycle, motion tracking framework for mobile appliances, online GIS module for an unmanned aerial vehicle, and an innovative active-vision-based approach for traffic surveillance and control.

Currently the speed of MMS technological development is still very rapid. We can expect major contributions toward the perfection and popularity of the technology in years to come.

Recent Relevant Publications

Li, R., M. Mostafa, C.V. Tao and C. Toth 2002. Section 14.3 Mobile Mapping, in the 5th Edition of Manual of Photogrammetry edited by E.M. Mikhail, J.C. McGlone and J. Bethel, to be published by John Wiley & Sons.

Grejner-Brzezinska, D. A. 2001. Mobile Maping Systems: Ten Years Later, Part I, Surveying and Land Information Systems, June 2001, pp.75-92.

El-Sheimy, Naser (Ed.) 2001. Proceeding of the 3rd International Symposium on Mobile Mapping Technology (MMS). Cairo, Egypt, January 3-5, 2001. (CD-ROM)

Pollefeys, M., R. Koch, M. Vergauwen, and L. Van Gool 2000. Automated reconstruction of 3D scenes from sequences of images. ISPRS Journal of Photogrammetry and Remote Sensing. Vol.55, No.4, pp. 251-267.

Tao, C. V., M. A.Chapman, and B. A. Chaplin 2001. Automated processing of mobile mapping image sequences. ISPRS Journal of Photogrammetry and Remote Sensing. Vol.55, No.5-6, pp. 330-346.

Mostafa, M. M.R, K-P. Schwarz 2001. Digital image georeferencing from a multiple camera system by GPS/INS. ISPRS Journal of Photogrammetry and Remote Sensing. Vol.56, No.1, pp. 1-12.

Habib, A. F. 2000. Matching Road Edges in Stereo-Image Sequences Using Data Association Techniques. Photogrammetric Engineering and Remote Sensing, Vol.66, No.1, pp.91-98.

Tao, C. V. 2000. Semi-Automated Object Measurement Using Multiple-Image Matching from Mobile Mapping Image Sequences. Photogrammetric Engineering and Remote Sensing, Vol.66, No.12, pp.1477-1485.

Mills, J. P., I. Newton and G. C. Peirson 2001. Pavement Deformation Monitoring in a Rolling Load Facility. The Photogrammetric Record. Vol.17, No.97, pp.7-24.

Accomplishments of the Working Group

The 3rd International Symposium on Mobile Mapping Technology (MMS) was held in Cairo in January 3-5,

2001. It was co-organised and co-sponsored by Ain Shams University, Egypt, ISPRS Commission II (WG II/1 "Real-time Mapping Technology"), FIG Commission V (WG 5.3 "Kinematic and Integrated Positioning Systems"), IAG Special Commission IV (WG SC4.1 "Mobile Multi-Sensor Systems"), the University of Calgary, the Egyptian Survey Authority, and the Chinese National Lab for Information Engineering in Surveying, Mapping and Remote Sensing.

This symposium was very well attended and has had a significant influence on future research and development of real-time mapping technologies. The most recent R&D and application achievements of mobile mapping technology were reported to 350 participants from 29 countries. They attended 90 oral presentations in 18 sessions. The Conference brought together specialists, engineers, users, and those interested in mobile mapping technology, kinematic real-time positioning, sensor integration and calibration, feature extraction and 3-D data acquisition.

Working Group News and Future Plans

- WG II/1 will sponsor the event "Celebrating 50 Years of Geodetic Science at The Ohio State University", October 1-5, 2002.
- WG II/1 will co-sponsor the International Workshop on Mobile and Internet GIS, Wuhan, China, August 15-16, 2002
- The 4rd Mobile Mapping Conference in Kunming, China, May 25-27, 2003.
- Sessions at the 20th ISPRS Congress, Istanbul, Turkey, July 12-23, 2004.
- The 5th Mobile Mapping Conference in France, 2005.

WG II/2: SYSTEMS FOR SAR AND LIDAR PROCESSING

Chair: Bryan Mercer (Canada)
Co-Chair: Charles Toth (USA)

State of Science and Technology on Working Group Topics

The Lidar and InSAR fields are both seeing dramatic growth in interest, development and use. In the Lidar area, the major vendors are improving or incorporating system performance parameters such as pulse repetition rates, laser power, reflectance measurement, and multiple-return measurements. Widely-supported claims of vertical accuracies at the 15cm RMSE level or better are being reported although there is still some ambiguity regarding performance with respect to sloped terrain, canopy and in other unfavourable conditions. At this time over 60 systems are believed to exist world-wide and the number is increasing. On the InSAR side, the systems are also improving, particularly with respect to vertical accuracy, where sub-meter (RMSE) vertical results have been demonstrated in many areas. Perhaps the major problem being addressed currently is how to obtain bare-earth under various conditions. While software has been successfully developed for extracting bare-earth DEMs in some conditions (low-density urban areas, patchy forests); the challenge is obtain ground elevations in heavily forested areas. A great deal of development effort is currently focussed on the potential of longer-wavelength, multi-polarisation InSAR. Over the next year there should be additional data and experience available against which to gauge the level of success of these endeavours.

Accomplishments of the Working Group

A 2.5 day workshop on 'Three-Dimensional Mapping from InSAR and Lidar' was held in Banff, Alberta, Canada in July and hosted about 40 participants from Asia, Europe and North America. Participants included researchers, data providers, users, students, and system vendors. This was the first 'official' ISPRS WG meeting addressing these two technologies. About 20 presentations addressed a series of topics including InSAR/Lidar comparative performance, Lidar and InSAR applications, bald-earth processing, synergies with other sensors, and GPS/INS issues. A wide-ranging panel discussion addressed technical and more general issues of the group. Judging by the feedback, the workshop was very successful, particularly in the context of information exchange between and among these two groups.

Liaison Activities:

- OEEPE: Members of WGII/2 participated in an OEEPE-sponsored Lidar/InSAR workshop which was held in Stockholm in March. This was particularly useful as there had been data exchanges to allow performance inter-comparison.
- CEOS: A Cal/Val Terrain Mapping Sub-Committee presentation was made as part of the Banff Workshop.
- Other: Members participated in various relevant workshops or conferences including the kick-off meeting of the International Lidar Mapping Association (Denver, February), ASPRS 2001 (St. Louis, April), WGIII/4 workshop on 'Land Surface Mapping and Characterisation Using Laser Altimetry' (Annapolis, October), ASPRS/MAPPS 'Measuring the Earth' workshop (St. Petersburg, October), and Photogrammetric Week 2001 (Stuttgart, September).

Forthcoming:

- ICORSE: Together with WGI/3 (Mike Renslow), we will organise and participate in an ISPRS-sponsored session on InSAR and Lidar at the ICORSE symposium in Buenos Aires in April 2002.
- Various: There are several conferences relevant to WGII/2 in the coming year including our own Commission II symposium (Xi-An, China: August, 2002).

WG II/3: INTEGRATED SYSTEMS FOR INFORMATION SERVICES

Chair: Poul Frederiksen (Denmark)
Co-Chair: Chongjun Yang (China)

State of Science and Technology of Working Group Topics

The demands on updating techniques for geo-spatial databases are increasing. It has become a crucial factor for the operability, usefulness and maintenance of geo-databases. The geo-database is often the first level in a hierarchy of data comprising geo-related, administrative, environmental or utility information, so the demands on update and completeness of geo-data are high. It is expected that future systems for geo-information services will be based on generally accepted keys like addresses and that the databases will contain geometry information, geo-referenced satellite images, aerial photos and various derived products. There is focus on the interoperability between public and private databases, Internet based distribution systems and the necessary standards for data exchange. Key words are: change detection, plus/minus data, updating frequency, reliability, object dependent updating and Internet based software solutions for distributed updating.

Accomplishments of the Working Group

The working group participated in the preparation of The 3rd ISPRS Workshop on Dynamic and Multi-dimensional GIS – Geoinformatics & DMGIS'2001 at the Asian Institute of Technology, Bangkok, Thailand, May 23 – 25, 2001. A WG business meeting was included in the conference programme and conducted in co-operation with WG II/5.

WG II/3 organised and sponsored an international workshop related to the WG terms of reference. The meeting "International workshop on Information Technology and Flooding Management" was held in Beijing, September 16 -17, 2001. More than 50 delegates from 10 countries attended the workshop.

A WG II/3 web-site has been designed and implemented. The activities, news, discussions, and readings related to WGII-3 terms of reference are presented (http://www.digitalearth.net.cn.wgii-3htm). The web-site is registered in a number of Internet search engines such Yahoo, Google, AltaVista, Chinese Yahoo, Sohu, Sina etc. The WG II/3 web-site can be reached by plain key words like "WGII-3", "integrated systems", "information service" or "ISPRS". After the first 6 months of operation, more than 100 visits have been registered per day.

WG II/3 is regularly informed by CEOS through the CEOS mailing list.

Working Group News and Future Plans

In order to promote the development of WG II/3 related activities and awareness, a resource library is under construction. It consists of the links and web-sites related to the terms of reference of the WGII/3, such as Professors & Young pioneers – Research, Symposia & Organisations – Education, Universities & Institutes – Software, Systems & Applications – Readings, Materials and Resources - News lists & Mail lists.

The WG will contribute to the organisation of the mid-term Commission II symposium in Xi'an in August 2002 with a WG II/3 session.

In Spring 2003 it is planned to joint efforts with WG II/5 and DMGIS for a workshop at ITC in The Netherlands.

Dr.Poul Frederiksen, has moved to a new position in Topographic Department of Kort & Matrikelstyrelsen - National Survey and Cadastre.

WG II/4: IMAGE DATA STANDARDS

Chair: Wolfgang Kresse (Germany)
Co-Chair: Liping Di (USA)

Accomplishments of the Working Group

Presently the membership list contains 59 people from 13 countries

An unofficial meeting held on October 13th 2000 at the Berlin International Congress Center, Berlin, Germany. The meeting was attended by 5 people from 2 countries.

The first official meeting was held on June 18th and 19th 2001 in two DIN buildings (Germany Institute for Standardisation), Berlin, Germany. The meeting was attended by 14 people form 6 countries. This meeting was a joint one with the ISO TC211 project team of ISO 19130 "Sensor and data models for imagery and gridded data"

The scope of the ISO project 19130 is the following:

- It will specify a sensor model describing the physical and the geometrical properties of each kind of photogrammetric, remote sensing and other sensors that produce imagery type of data.
- It will define a conceptual data model that specifies, for each kind of sensor, the minimum content requirement and the relationship among the components of the content for the raw data that was measured by the sensor and provided in an instrument-based coordinate system, to make it possible to geolocate and analyse the data.

The discussions in Berlin laid the basis for the first draft of the new international standard.

Joint meeting with the project team ISO 19130 in June 2001 (see above)

Participation of WG members in the development of the ISO 19129 "Imagery, gridded and coverage data framework" and of the ISO 19130 "Sensor and data model for imagery and gridded data" standard:

During the week October 22nd – 26th 2001 the ISO/TC211 plenary met in Adelaide, Australia. At October 22nd the project team of ISO 19130 had its meeting

which was the next one after the joint meeting in Berlin in June 2001. At October 23rd the meeting of the project team of ISO 19129 took place.

The project team of ISO 19130 published a Working Draft (WD) to the plenary of ISO/TC211. The WD contains a first detailed approach to the coming standard. The most important topics are digital frame camera, pushbroom- or swath-type sensors, SAR/InSAR, lidar, and hydrographic sonar. Another topic deals with the coordinate systems being involved. WG members have helped ISO with their profound technical expertise many times.

The project team of ISO 19129 published a Working Draft (WD) to the plenary of ISO/TC211 as well. The most important topics are the creation of metadata listings, quality aspects, a standardisation of product levels and the definition of services which denote modules of a workflow.

One of OGC experts in photogrammetry and remote sensing is a member of ISPRS WG II/4. Thus OGC gets regular updates about the progress of our work. Also WG II/4 is always well informed about OGC proposals.

WG II/5: DESIGN AND OPERATION OF SPATIAL DECISION SUPPORT SYSTEMS

Chair: Wolfgang Kainz (The Netherlands)
Co-Chair: Qiming Zhou (Hong Kong)

State of Science and Technology of Working Group Topics

Spatial decision-making based on a combination of image-based and vector data is an important activity in many application domains. The underlying paradigm of field versus object-based models has become an extensively researched area in many disciplines ranging from theoretical to application oriented. The support of decision making with knowledge-based techniques (rule-based systems) and artificial neural networks has found many useful applications reported in the literature. We observe an increased interest in combining standard GIS functionality with novel approaches taken from fuzzy logic and artificial neural network technology. The co-operation of producers of spatial decision support systems and users of these systems is increasingly recognised as an approach to provide better spatial decision support to real world problems.

Accomplishments of the Working Group

- Establishing of a mailing list of members who have indicated their interest in active participation in the WG activities.
- Presentation of the WG and discussion of activities at the 3rd ISPRS Workshop on Dynamic and Multi-Dimensional GIS, Bangkok, Thailand, May 23-25, 2001. This was a joint presentation with WG II/6 - Spatial analysis and visualisation systems and WG II/3 - Integrated systems for information services.
- Presentation and invitation of the International Institute for Aerospace Survey and Earth Sciences (ITC) to host the 4th ISPRS Workshop on Dynamic and Multi-Dimensional GIS in the Netherlands in the spring of 2003.

Working Group News and Future Plans

The WG has planned the following activities for the coming year:

- Co-organisation of the International Workshop on Mobile and Internet GIS in Wuhan, China, August 15-16, 2002.
- Organisation of a special session at the Commission Symposium at Xian, China, August 20-23, 2002
- Presentation of a review paper at the Xian Symposium

The chairman of the WG, Prof. Dr. Wolfgang Kainz, has accepted a position of full professor of cartography and geoinformation at the Department of Geography and Regional Research, University of Vienna, Austria, and will assume this new post as of February 2002.

WGII/6: SPATIAL ANALYSIS AND VISUALISATION SYSTEMS

Chair: Zhilin Li (Hong Kong)
Co-Chair: Menno-Jan Kraak (The Netherlands)

Accomplishments of the Working Group

The WG II/6 together with other sister working groups (WG II/3, WG II/5, WG IV/1, WG IV/2, WG V/5) of the ISPRS, the CPGIS, the National Key Lab for Information Engineering in Surveying, Mapping and Remote Sensing (LIEMARS), the Asian Institute of Technology (AIT) organised the 3rd International Workshop on Dynamic and Multi-dimensional GIS, during 23-25 May 2001, at Asian Institute of Technology, Bangkok. It was a very successful meeting. More than 150 participants from 30 countries (regions) attended the meeting. 20 technical sessions were scheduled and nearly 100 paper were presented. The meeting also attracted exhibitions from various countries such as China, Canada and USA. The following session topics are very closely related to the terms of references of this working group:

- 3-D visualisation;
- Spatial relations and reasoning
- Spatial Analysis

A joint business meeting with WG II/3 and II/5 has been held during the workshop.

A web-site for the Working Group has been set up at the Hong Kong Polytechnic University. The address is: http://www.lsgi.polyu.edu.hk/isprs_c2wg6/

Working Group News and Future Plans

The WG II/6 and WG IV/2 (Federated databases and interoperability), WG II/1 (Real-time Mapping Technologies), WG II/5 (Design and operation of spatial decision support systems), together the LIESMARS of Wuhan University have planned an International

Workshop on Mobile and Internet GIS, as the pre-symposium workshop of the Commission II's Xi'an Symposium. The workshop plan has already been approved by the ISPRS council. The workshop will be held during August 15-16, 2002 at Wuhan University, China.

The WG II/6 will try to make more contact with other WGs or organisations. It is intended to have a joint meeting with ICA. This linkage has become very natural because Prof. Dr. Menno-Jan Kraak of ITC is also the co-chair of the ICA Commission on Visualisation.

INTERCOMMISSION WG II/IV: AUTOMATED GEO-SPATIAL DATA PRODUCTION AND UPDATING FROM IMAGERY

Chair: Christian Heipke (Germany)
Co-Chair: Ammatzia Peled (Israel)

State of Science and Technology of IC WG II/IV Topics

There are many scientific groups doing research in automatic cartographic feature acquisition. One focus is on capturing of 3d objects. The use of sensors like laser scanners increasingly gains in importance, especially in combination with imaging sensors. The new digital sensors start to be interesting for automatic image interpretation and object extraction research.

Automatic Aerial Triangulation reached a point where it became a standard component of a photogrammetric systems. New developments are characterised by comfortable handling of large blocks and tools for simplified error analysis during the processing chain. Concerning the automation of cartographic feature extraction the transition of experimental systems into practical solutions is very low. Presently the appropriate way to incorporate automatic image analysis into operational systems is by semi-automation, which is reflected by recent developments.

Efforts have been undertaken to integrate new camera models into digital workstations in order to be able to use new digital data material for photogrammetric analysis.

Concerning updating of GIS, besides the data capture itself the management of the updating information in the database is a relevant topic itself. Automatic update including topological changes still is nearly unsolved. In many cases from the operational point of view the acquisition of the complete data set is easier than to incorporate acquired changes into an existing data set. Automatic DTM generation has been accepted by the practice some time ago, but interactive verification and editing is there to stay, especially in difficult terrain, and in large scales.

Digital photogrammetric workstations more and more approach a GIS leading to integrated solutions which cover the complete process from data capture to data management, analysis, visualisation and dissemination. At present they are incorporating database and visualisation functionalities, partly even in 3d.

In fact the co-operation and exchange between GIS and photogrammetry still is rather low, especially from the commercial point of view. There still is a lack in standardised exchange between the respective systems but the companies seem to have recognised the lack in integrated solutions for the end-user.

Accomplishments of the IC Working Group

A one-day workshop entitled „From Imagery to Geodata", April 26, 2001, took place during the ASPRS conference in St. Louis. The workshop was integrated in the annual conference of the ASPRS, held in St. Louis, USA. It was organised jointly by

- ISPRS WG I/4: Advanced Sensor Systems,
- ISPRS WG I/5: Platform and Orientation Integration
- ISPRS Inter-Commission WG II/IV: Systems for Automated Geo-Spatial Data Production and Updating from Imagery

A report by A. Krupnik is published in ISPRS Highlights Vol. 6, No. 3, Sept. 2001.

The second ICA/ISPRS Joint Workshop on Incremental Updating and Versioning of Spatial Data bases was held in Beijing 4-5.8.2001 prior to the ICA Congress with 14 participants from 11 Countries, representing Academia, National and regional Mapping Agencies, and private sector. The results of this workshop are:

- About 60 issues concerning versioning and Incremental updating were pointed out for further discussion during next year.
- A book, containing about 18 reviewed papers is sought for the end of 2002.
- Further co-operation is needed and a joint Workshop with Eurogeographics was found to be the better solution (under discussions for the end of 2002)

An OEEPE/ISPRS workshop entitled "From 2D to 3D : Establishment and Maintenance of National Core GeoSpatial Databases", was held on Oct. 8-10 2001 in Hanover, Germany. The workshop was hosted at the state mapping agency LGN and was jointly organised by OEEPE and ISPRS and conducted by ISPRS Inter-Commission WG II/IV (Systems for Automated Geo-Spatial Data Production and Updating from Imagery) and ISPRS WG IV/ 3 (Data Generalisation and Data Mining). A report by S. Nebiker is to be published in ISPRS Highlights.

A workshop tutorial on „Softcopy Photogrammetric Production: The Concepts and State-of-the-Art Technology", was integrated in the annual conference of the ASPRS, which took place in St. Louis, USA. It was organised jointly by ISPRS WG I/4 (Advanced Sensor Systems) and ISPRS Inter-Commission WG II/IV (Systems for Automated Geo-Spatial Data Production and Updating from Imagery).

The ICWG web-site is to be found on http://www.ipi.uni-hannover.de/isprs-wg2-4. The ICWG has also sent out circular letters and working group news, which were distributed via e-mail

The ICWG has co-operated with other groups and organisations:
- ISPRS Comm. III WG's
- OEEPE
- ASPRS, Digital Photogrammetry Committee
- ICA, WG on Incremental Updating and Versioning of Spatial Data Base

Working Group News and Future Plans
- Technical Session during the ISPRS Comm. II symposium in Xian China 2002
- Technical Session during the ISPRS Comm. IV symposium in Ottawa Canada 2002
- Joint ICA/ISPRS Workshop with Eurogeographics under discussions for the end of 2002
- Special Issue of ISPRS Journal for PF & RS entitled "Fusion of geodata and imagery for revision and updating purposes", planned for 2003/04
- The 4th Joint Workshop will be held in South Africa, in Conjunction with the ICA Congress (circa August 2003).
- Workshop entitled: "Photogrammetric Image Analysis" in 2003, autumn in Munich, Germany jointly organised with other ISPRS WG's
- Technical Sessions during the ISPRS congress in 2004, Istanbul, Turkey

Plans for the Future
- The Commission will also organise technical sessions at the ISPRS Comm. IV symposium in Ottawa Canada July 2002 (ICWG II/IV)
- ISPRS Commission II is planning a special Issue of ISPRS Journal for PE & RS entitled "Fusion of geodata and imagery for revision and updating purposes" for 2003/04

TECHNICAL COMMISSION III
THEORY AND ALGORITHMS

President: Franz W. Leberl (Austria)
Scientific Secretary: Rainer Kalliany (Austria)

Accomplishments of the Commission
Commission Organisation and Activities
Commission III has 8 regular working groups plus one Inter-Commission Working Group jointly with Commission V. The structure has solidified during the reporting period, with good and active leadership in each. Council has expressed concern that the Working Group in Commission III and one in Commission V, on Industrial Vision do not have enough independent momentum to operate separately. The suggestion has therefore been made to have the two groups work together, join or merge. This recommendation is currently under review by the relevant WG-leaderships.

Early on in the year, Commission III developed and submitted a proposal to the European Commission to organise the European Working Groups as a "Research Network" under the title "Photogrammetric Vision for Augmented Reality (PHOVAR)". It was proposed to have the US-WG associated with this network, without an exchange of funds. This proposal, while successfully submitted, did not get funded.

The Symposium of the Commission is set under the motto "PCV'02 – Photogrammetric Computer Vision 2002" and will take place in the week of 9th-12th September 2002 in Graz. Details are available from the web site under http://www.icg.tu-graz.ac.at/isprs/comm3/symp2002. The symposium venue has been reserved at the Grazer Congress. Calls for papers were sent to each and every participant of the Amsterdam Congress of the ISPRS, and have been advertised via journals and calendars of events. The symposium will be held in conjunction with two other meetings, namely the:
- Annual Meeting of the Austrian Association for Pattern Recognition (AAPR), and with an
- East-West-Vision event to bring together vision experts from Eastern Europe and the West.

PCV'02 will feature three keynote speakers, one for each day of the 3-day symposium on the 10th, 11th and 12th of September; and all three from the vision community.

The conference will be preceded by a series of Tutorials on Monday, 9th September 2002. Three such tutorials have so far been committed. The East-West-Vision meeting will then follow on Friday, 13th September.

The Organization if Islamic Capital Cities (OICC) is regularly meeting with its political and technical staffs. These meetings are associated with Technical Symposia for the technical municipal staff. The most recent meeting was held in Cairo (Egypt) in February 2001. The request was made to have ISPRS attend the meeting and to present a paper on 3D Geographic Information Systems. This invitation was accepted by the undersigned as President of Commission III, and a paper was given on Virtual Habitats.

A meeting was held between the Presidents of Commissions III and V in Thessaloniki at the occasion of the International Conference on Image Processing (ICIP)

in November 2001. A report on the ICIP is presented below. The co-ordination of Commissions III and V is important given the interests of the two Commissions. Commission V addresses Theories and Algorithms in the context of close range photogrammetry. Commission III covers the Theories and Algorithms of Photogrammetry not only for the aerial and satellite cases, but independent of any application and distance between sensor and object. This leads to an overlap in the interests of the people contributing to the two Commissions. It was agreed that it makes sense to have some Working Groups with shared affiliations, such as the Inter-Commission WG on Image Sequence Analysis, and to follow through on the recommendation from the ISPRS leadership to co-operate in the area of Industrial Vision.

The Annual Convention of the American Society for Photogrammetry and Remote Sensing is the most important annual event for photogrammetry with an attendance in excess of 2000 people and a large exhibit. The undersigned attended the 2001-event in St. Louis and met with various WG-chair-people to ensure that a regular flow of information takes place.

During the week of June 2001, the 3rd Ascona Workshop was held on the reconstruction of Man-Made Objects. This was used also to organise a Commission III WG Chairpersons meeting.

Networking with the Computer Science Community

One of the important initiatives of Commission III during the current inter-congress period 2000-2004 is the increased awareness that the fields of photogrammetry and computer vision are closely related. As a result a series of actions exists to ensure cross-fertilisation between the two fields of which one is embedded in computer science, and the other is embedded in surveying engineering.

The IEEE operates various societies, among them the Signal Processing Society, and is centred on the US-"market". The universe of IEEE is of course the field of electrical engineering, but with a membership in excess of 1 million, the actual membership is rather diverse. In the mid-1990's, the Signal Processing Society started an annual conference series under the heading "ICIP", and by now this has reached an attendance of more than 1000 each year, with 1600 paper submissions and an acceptance rate of about 50%. This year's conference was held in Thessaloniki (Greece), 7th to 10th October 2001, and organised by John Pitas, professor of electrical engineering of the University in Thessaloniki, home also of a photogrammetry group under Prof. Petros Patias.

ICIP offers special sessions, workshops and tutorials. ISPRS could co-sponsor such special events. There is no exhibit. The people attending the conference are from academia and from corporate research laboratories. Noticed was the strong emphasis of the conference on video processing, thus the processing of image sequences at video rates.

The IEEE Computer Society is the sponsor of the annual conference for Computer Vision and Pattern Recognition, a smaller conference with about 500 attendees and 150 papers. This year's meeting was attended by 650 people and was larger since it was held in Hawaii, 9th-14th December 2001, and the number of papers exceeded 250. Submitted were almost 1000 full papers, therefore the acceptance rate is about 25%. Also CVPR offers tutorials, workshops and special sessions; the opportunity would exist for ISPRS to co-sponsor such events.

There are three other international meetings that deserve ISPRS-attention in the computer vision area, namely the bi-annual meetings of the International Association for Pattern Recognition IAPR, the International Conference for Computer Vision ICCV, and the European Conference for Computer Vision ECCV. These meetings will receive specific Commission IIII attention in the coming periods.

Regional and national meetings are also being held, such as that by the German Pattern Recognition group DAGM, next to be held in Zurich in 2002.

Issues and Concerns

Thus far, Working Group activities are planned but not actually carried out. The transition from announcement to action should begin in 2002 and then increase in 2003, as the Congress gets organised for 2004. As presented below, all working groups are planning a major action in 2002 and a workshop in 2003, in part co-ordinated among the various groups.

The need to co-ordinate among Commissions is strongly felt in the ISPRS-leadership. Obviously, this need exists, but it has currently not reached a status beyond good will. Between Commissions III and V, the topic of Industrial Vision has specifically found some shared interest. Remote sensing is a topic that appears in all commissions, and the related "Theories and Algorithms" are not limited to any one Commission. Sensor technology is associated with the need to calibrate and model, yet that is a topic that is "owned" by both, Commissions I and III.

Remote Sensing is underexposed in Commission III. In fact one might argue that traditionally, "photogrammetry" is the topic of Commission III. The need would exist to develop a profile that includes relevant elements of Remote Sensing in Commission III. Only WG III/6 on Multi-Source Vision is explicitly and clearly addressing Remote Sensing issues, the other WGs are not.

Outlook for 2002

Of course, the year will be dominated by the symposium in September of 2002. In addition, the Vision link-up will continue by attending the vision conferences and by encourag-

ing participation from ISPRS-affiliates. The liaison with IEEE, IAPR and SPIE is needed since these three organisations are the most prominent in dealing with imagery and the extraction of information from visual sources. This goes beyond "vision" and includes remote sensing.

At the meeting of the WG-Chairman, attended by nearly all WG-leaders, it was decided to deviate from the ISPRS tradition and to request full papers instead of abstracts only, for consideration in the Symposium. It was furthermore decided that a Special Issue should be prepared of the ISPRS J. of Photogrammetry and Remote Sensing, to appear at the beginning of 2004.

Working Group Activities during the Current Year

WG III/1: SENSOR POSE ESTIMATION

Chair: Henrik Haggrén (Finland)
Co-Chair: Ayman Habib (USA)

Accomplishments of the Working Group

- The home page of WG III/1 was created http://www.commission3.isprs.org/wg1.
- A preliminary list of contacts was collected.
- The WG–interaction was electronic only during the year.
- The call for papers regarding to the symposium in Graz in 2002 was sent to the potential interest group.
- An initial plan for a WG meeting as an active workshop in Helsinki in 2003 has been proposed.
- Chairman Henrik Haggrén participated in international meetings regarding and promoted the WG activities as follows:
- 1-3 March 2001: OEEPE workshop on "Airborne Laser scanning and Interferometric SAR for Detailed Digital Elevation Models", Stockholm
- 18-21 September 2001: CIPA 2001 International Symposium on "Surveying and Documentation of Historic Buildings, Monuments and Sites, Potsdam, Germany.
- Co-Chair Ayman Habib participated in international meetings regarding and promoting the WG activities as follows:
- OEEPE Workshop on Integrated Sensor Orientation. Institute for Photogrammetry and Engineering Surveying, University of Hanover, (17-18 September 2001). Could not be personally there due to flight cancellation after September 11, 2001.
- Joint Workshop of ISPRS WG I/2, I/5 and IV/7: High Resolution Mapping from Space 2001, University of Hanover (19-21 September, 2001). Could not be personally there due to flight cancellation after September 11, 2001.
- ASPRS "Gateway to the New Millennium", St. Louis, Missouri (23-27 April 2001).
- Third Mobile Mapping Symposium, Cairo, Egypt, January 2001.

Working Group News and Future Plans

Both chairmen are preparing for a forceful participation in the Commission III Symposium in Graz (Austria, September 2002). In addition, they are in the process of compiling a list of interesting activities and challenges dealing with the sensor pose estimation. This list will be the basis for the proposed working group meeting in 2003.

WG III/2: SURFACE RECONSTRUCTION FROM IMAGES AS INFORMATION SOURCE

Chair: Michel Roux (France)
Co-Chair: Amnon Krupnik (Israel)

State of Science and Technology of Working Group Topics

The goal of this WG is to broaden the traditional focus of photogrammetry on "stereo-matching" to other methods of finding shape information, and to broaden it also from the focus on the Earth's surface to non-topographic topics.

Our role is to promote the investigation of the entire range of image based shape reconstruction methods, and to motivate the interaction with the Computer Vision community, where these methods of "Shape-from-X" are developed.

Topography typically is looked at from only one side, and results in so-called 2.5D models, also typical of Shape-from-X approaches. But objects are 3-dimensional, and need to be looked at from all sides. We should thus also broaden our perspective from 2.5D to 3D.

Accomplishments of the Working Group

- June, 3rd Ascona Workshop and Commission III WG Chairpersons meeting.
- November, IEEE/ISPRS joint Workshop on "Remote Sensing and Data Fusion over Urban Areas", Rome, Italy.
- Participation in the definition of evaluation protocols for surface reconstruction and scene analysis in collaboration with WG III/8 (to be presented at Commission III Symposium, Graz, Sept. 02).
- The WG participated in the EU-Network-Proposal "PHOVAR" initiated by Commission III.

Working Group News and Future Plans

- WG III/2 home page and news letters.
- September 2002: ISPRS Commission III Symposium, Graz, Austria.
- July 2003, organisation of a Commission III ISPRS Workshop (WGs 2, 4 and 8): "From Surface Reconstruction to Scene Analysis: Theory, Algorithms and Performance Evaluation" which will be held in Paris, France.
- Summer 2004, participation in the XX ISPRS congress in Istanbul, Turkey.

WG III/3: 3D RECONSTRUCTION FROM AIRBORNE LASER SCANNER AND INSAR DATA

Chair: George Vosselman (The Netherlands)
Co-Chair: Hans-Gerd Maas (Germany)

State of Science and Technology of Working Group Topics

Progress in both laser scanning and InSAR can be observed in the fields of instrument design as well as algorithm development and data processing. Instrumental developments of both laser scanners and InSAR's continue to open up new markets for cost effective, dense and accurate digital elevation models in a large variety of applications. While the techniques are being used in daily practice, the processing of the large volumes of data is still cumbersome and requires a higher degree of automation. Estimates show that 60-80% of project costs are related to quality assessment and manual classification of bare earth points. This clearly indicates the need for further development of sensor calibration and feature extraction tools. Developments to be expected are the utilisation of multiple pulse reflections and signal strength in processing point clouds, as well as explicit error modelling for calibration purposes. The ongoing trend towards higher temporal resolution of laser scanner instruments (and thus higher point densities) will improve both the quality of terrain representation and the success of filtering techniques.

The concept of waveform digitisation and analysis with the goal of improving land cover characterisation for ecosystem and climate modelling has been successfully proven in airborne systems by NASA and is planned in a space borne multi-profiler system for global coverage.

Further progress has been made on the field of 3-D building reconstruction from airborne laser scanner data with dense and moderate point density, widening scope of applications of the technique. Elementary data fusion approaches have been used in this field, and are likely to play an important role in future developments.

Over the year several events took place that are completely or in part devoted to the topics of the working group. The proceedings of these events give an up to date overview on the current state of the technology.

- Proceedings OEEPE workshop on Airborne Laser scanning and Interferometric SAR for Detailed Digital Elevation Models, March 1-3, in print on CD by the OEEPE.
- Automatic Extraction of Man-Made Objects from Aerial and Space Images in Ascona (III), proceedings 3rd Ascona workshop, June 10-15, Swets & Zeitlinger Publishers.
- Proceedings ISPRS workshop on Land Surface Mapping and Characterisation Using Laser Altimetry Annapolis, October 22-24, IAPRS, vol. 34, part 3/W4, available through RICS books, London.

Coming up in November is a special issue on laser altimetry of the PE&RS journal.

Accomplishments of the Working Group

This year the main activity of the working group has been the workshop on Land Surface Mapping and Characterisation Using Laser Altimetry, jointly organised with ISPRS WG III/6, University of Maryland, the Ohio State University, and the NASA Goddard Space Flight Center. The workshop was held in Annapolis, Maryland, USA on October 22-24. It attracted 80 participants from various backgrounds. Around 40 papers were presented on system overviews, surface reconstruction, data geolocation, data fusion, data modelling, forestry applications, and mapping of geo-surficial processes. A report for the ISPRS Highlights is in preparation.

The working group also set up its web site http://www.commission3.isprs.org/wg3/

Working Group News and Future Plans

- Currently a comparative test is being prepared on the performance of filtering algorithms for the extraction of bare ground points from arbitrary point clouds. Materials will be distributed to interested working group members around the end of 2001.
- The working group will organise a tutorial and one or two sessions at the Commission III Symposium in Graz in 2002.
- The working group is planning to host a workshop on 3D reconstruction in Dresden in October 2003.

WG III/4: AUTOMATED OBJECT EXTRACTION

Chair: Helmut Mayer (Germany)
Co-Chair: James Bethel (USA)

State of Science and Technology of Working Group Topics

Feature extraction can be done with high sub-pixel precision and also good robustness. Yet, new approaches based, e.g., on the Riesz transform allow for a more detailed modelling of the image function and therefore even better results.

Grouping is essential because feature extraction alone cannot be expected to result directly in parts of objects. Besides using more and more attributes such as the colour values of the features and their neighbourhood, grouping and matching processes are interleaved. A new trend is grouping in 3D object space using photogrammetric camera models and constraints on two or more images based on projective geometry including error propagation from probability theory.

Direct measurement of distances via laser-scanning becomes more and more important. This is true for the detection and coarse approximation of buildings from aerial data as well as for applications in close range such as 3D video communication.

In the high level the need for global models making use of the relations of all (important) objects in an image is considered to be important, though there is few work going into this direction. By means of sound statistical methods such as Bayesian networks the stochastic component can be modelled.

Accomplishments of the Working Group
Meetings:
- June 10-15, 01: WG meeting during the Ascona Workshop

Activities:
- The WG is involved in the EU-Network-Proposal "Photogrammetric Vision for Augmented Reality" (PHOVAR) initiated by Commission III.

Working Group News and Future Plans
Plans for Meetings:
- May, 28-31, 2002: Working group meeting during ECCV 2002 in Copenhagen, Denmark
- September 9-13, 2002: Session at the Symposium of Commission III in Graz, Austria
- September, 2003: Conference on "Photogrammetric Image Analysis" Munich, Germany in co-operation with WG II/IV, III/5, III/6 as well as possibly III/2 and III/8. (Involved: Albert Baumgartner, Konrad Eder, Christian Heipke, Olaf Hellwich, Felicitas Lang, Jürgen Peipe, Carsten Steger, Christian Wiedemann, Helmut Mayer and Heinrich Ebner)
- July, 12-23, 2004: Sessions at the ISPRS Congress in Istanbul, Turkey

Plans for Activities:
Test for performance evaluation of systems for the automatic extraction of man-made and natural objects together with - WG III/7 and III/8
- WS in conjunction with ICCV in Beijing, China, 2003

WG III/5: ALGORITHMS FOR INDUSTRIAL VISION

Chair: Carsten Steger (Germany)
Co-Chair: Stefan Scherer (Austria)

State of Science and Technology of Working Group Topics
Line sensor cameras are becoming increasingly popular in industrial applications. Currently, there is a growing need for camera calibration in these applications. While there are a large number of calibration approaches for aerial and space-borne line sensor cameras, there do not seem to be easy-to-use techniques for offline or online calibration in industrial settings.

In applications where extremely high measurement accuracy is required, there must be a linear relationship between the energy received by the sensor elements on the camera and the grey values in the image because almost all measurement techniques (edges, grey-value moment-based techniques, etc.) explicitly or implicitly assume this linear relationship. Currently, there are no easy-to-use techniques for offline or online radiometric calibration in industrial applications.

Depth-from-focus is used in a number of applications. Currently, these systems assume that the focal plane is flat. Usually, this will not be the case, and hence neglecting this distortion causes measurement errors because the depth is reconstructed incorrectly. Hence, in depth-from-focus applications there is a need to calibrate the focal plane distortion.

A growing number of applications where the pose of objects must be determined, e.g., for alignment purposes, is solved using so-called geometric or shape-based pattern matching methods, as is evidenced by the growing number of machine vision software vendors that release software tools with this capability. Geometric matching is preferred because of its robustness to non-linear illumination changes, occlusion, and clutter. Current systems are capable of recognising planar objects under similarity transformations (translations, rotations, and size changes) in real time (i.e., at up to 30 frames per second). They are not capable of recognising planar of three-dimensional objects under perspective transformations. On the other hand, a growing need for systems with these capabilities can be seen, e.g., for robotic pick-and-place applications. While there are numerous approaches that have been and are being investigated for 3D object recognition, state-of-the-art systems do not achieve the necessary recognition speeds that are usually required in industrial applications.

Accomplishments of the Working Group
Meetings
- Informal WG member meeting during the 25th OeAGM/AAPR workshop "Computer Vision, Computer Graphics and Photogrammetry - a Common Viewpoint", June 7-8, 2001, Berchtesgaden, Germany.

Communication
- Establishment of a WWW site for the working group, http://www.commission3.isprs.org/wg5/
- List of WG-members
- Number of WG-members: 15
- Mailing of 1 WG newsletter by email

Working Group News and Future Plans
Plans for Meetings
- Sessions at the Symposium of Commission III in Graz, Austria, September 9-13, 2002
- Conference together with WG III/4 and III/6 and possibly other WGs in Munich, Germany, 2003
- Sessions at the ISPRS Congress in Istanbul, Turkey, July 12-23, 2004.

Co-ordination between Commissions III and V
The request has been noted that this WG should align itself closely with its sister WG in Commission V. We have not yet acted on this recommendation, but will do so before the Symposia series begins.

WG III/6: MULTI-SOURCE VISION

Chair: Olaf Hellwich (Germany)
Co-Chair: Beata Csatho (USA)

State of Science and Technology of Working Group Topics

Sensor as well as data fusion is increasingly applied. Nevertheless, frequent practical application does not occur to a degree corresponding with the technical potential of fusion. The reasons are threefold: (1) knowledge about various sensor systems is not available in many practical cases, (2) data fusion methodology is considered a too complex domain, (3) costs of data acquisition are considered too high. Regarding items (1) and (2), WG III/6 tries to ease difficulties by organising workshops fostering exchange of expertise and discussions among peers, and by conducting a data fusion contest objectively evaluating potential, advantages and disadvantages of multi-sensor data fusion.

Accomplishments of the Working Group

- July 11, 2001: Joint GRSS/ISPRS Session "Multi-Source Vision" at IGARSS 2001
- November 8-9, 2001: IEEE/ISPRS joint Workshop on "Remote Sensing and Data Fusion over Urban Areas"
- October 22-24, 2001: Joint Workshop on "Land Surface Mapping and Characterisation Using Laser Altimetry"
- The WG participated in the EU-Network-Proposal "Photogrammetric Vision for Augmented Reality (PHOVAR)" initiated by Commission III.

Working Group News and Future Plans

Plans for Activities

- June, 2002: Joint GRSS/ISPRS Session at IGARSS 2002, with a title to be defined.
- September 9-13, 2002: Session at the Symposium of Commission III in Graz, Austria
- tbd: Second IEEE/ISPRS joint Workshop on "Remote Sensing and Data Fusion over Urban Areas" in Berlin, Germany
- September, 2003: Conference on "Photogrammetric Image Analysis" in Munich, Germany in cooperation with WG II/IV, III/4, III/5, as well as possibly III/2 and III/8.
- July, 12-23, 2004: Sessions at the ISPRS Congress in Istanbul, Turkey
- Beginning 2002: Start of the data fusion contest "Information for Mapping from Airborne SAR and Optical Image Data" organised in the framework of OEEPE, IEEE GRSS, and ISPRS Commission III (for further information see IGARSS'01 proceedings, OEEPE Newsletter, EARSEL Newsletter).

WG III/7: MODELLING LARGE SCALE URBAN ENVIRONMENTS

Chair: David M. McKeown, Jr (USA)
Co-Chair: Seth Teller (USA)

State of Science and Technology of Working Group Topics

Existing techniques for model production are labour-intensive, typically requiring hundreds of person-hours even for fairly simple environments. Basic science in several areas is needed to achieve efficient, automated model generation methods. Outstanding science issues include the development of new sensors (include cameras, range sensors, and navigation sensors), and new algorithms for localising and registering multiple observations, for extracting useful models of geometry and texture from observations, and for integrating the generated models with existing GIS datasets.

Existing machine vision and photogrammetry techniques do not scale well to large, real-world data sets. Algorithmic (batch) techniques are restricted to small-baseline camera configurations, controlled or unvarying lighting conditions, and little or no visual clutter. Real-world model acquisition conditions require sensing over extended areas, under uncontrolled (outdoor) illumination, and in the presence of significant clutter due to foliage, people, etc. All of these present challenges of scale, extent, and robustness to data corruption.

The ability to cheaply and easily capture, recreate and simulate models of the physical environment is essential to a wide variety of technology, humanistic, and security sectors, including real estate, tourism, entertainment, urban planning, archaeology, military, police, and counter-terrorism operations.

Geometric models are essential to simulation, rendering, visualisation, and analysis applications across a wide variety of engineering disciplines. These include of course computer graphics and visualisation, in settings as diverse as police and military operations training and rehearsal, assertive navigation for the visually and physically impaired, wireless communication, commercial movie-making, archaeology, urban planning and commercial real estate, virtual tourism, and physical plant maintenance and archiving. Users of geometric models and interactive simulation include the disabled, consumers, businesses, cartographers, educators, artists, and civil and military organisations.

These possibilities motivate the activities of this working group, pursuing an integrated collection of research efforts spanning photogrammetry, computer vision, computer graphics, geometric modelling, computational geometry, and computer systems engineering. The central focus of the WG is to address the end-to-end problem of capturing large-scale geometric models from photographs of real architectural scenes, in order to support applications in all of the areas above.

Accomplishments of the Working Group

The ability to cheaply and easily capture, recreate and simulate models of the physical environment is essential to a wide variety of technology, humanistic, and security sectors, including real estate, tourism, entertainment, urban planning, archaeology, military, police, and counter-terrorism operations. This is the focus of WG III/7. Over the past year the co-chairs have focused on identifying the out-

standing science and engineering issues in the model capture problem, defining the problem's application area and identifying synergistic efforts within the broader research community. We have also begun planning a workshop, to be held sometime in 2003, to bring together research, government, and commercial interests in this area.

Working Group News and Future Plans

From a variety of sources, we have begun to solicit advice and support for convening a workshop, to be held sometime in 2003, which will bring together a variety of users and developers of geometric model capture techniques. The attendees will include photogrammetry and computer vision researchers, of course, as well as cartographers and other map producers and consumers. We also hope to attract a number of commercial representatives, developers of sensors and software. The aims of the workshop will be three-fold. First, to introduce disparate members of the community. Second, to raise general awareness across communities of the sensors and algorithms available. And third, to establish what will hopefully will be a lasting, interdisciplinary research and development program for techniques in rapid, large-scale model capture.

WG III/8: RELIABILITY AND PERFORMANCE OF ALGORITHMS

Chair: Nicolas Paparoditis (France)
Co-Chair: Eberhard Gülch (Germany)

State of Science and Technology of Working Group Topics

The conclusions of the ISPRS 1995-1999 WG II/6 workshop "3D Geo-spatial Data Production: Meeting Application Requirements" held in Paris in April 1999 was that both photogrammetric and computer vision, applied to geo-spatial data, communities were partly suffering in their publications from a lack of evaluation and comparison of their algorithms and techniques in comparison with other scientific fields.

Indeed, the evaluation tasks and protocols are most of the time not complete and rigorous enough for the published results to be optimally exploitable by other teams. This is certainly due to the fact that if evaluation had to be seriously realised within a year project or research the evaluation itself would take more than half of the project time. Moreover, data sets are often provided by a contractor and thus results of different teams can very seldom be compared on the same data source or on data of comparable quality (image quality, geometry of acquisitions). In addition, we manage complex systems mixing several algorithms. If the algorithms have not the capacity of evaluating themselves (reliability, accuracy) the construction of an efficient system is unrealistic. Very few papers address these self-evaluation and uncertainty management and propagation topics.

Accomplishments of the Working Group

The goal of this 1999-2003 commission III working group is to start providing data, recommendations, and tools to ease comparison and evaluation within our 3D geo-spatial community. The premium very practical issue of this WG is to provide within a web-site a very complete and up to date set of free and available source data but also reference data so that all laboratories could compare their results with one another on the same data sets. This web-site will also host the results of the willing and volunteer teams. The second issue is to build evaluation protocols and give free on-line access to the evaluation software so that researchers can evaluate their algorithms and systems at minor costs and within a common frame. The third issue, more theoretical, concerns the management and propagation of uncertainty (meta-data from self-evaluation) within algorithms and systems. The idea is to encourage specific papers on these topics but also to draw "how-it-could-be-done"-recommendations.

The activities of the WG for 2001 have been mainly concentrated on collecting data (panchromatic & colour digital frame camera images with very stereo overlap, LASER scans, digital ground plans, 3D-CAD reference models) on the city of Amiens (France) and building a web-site to host these data. The first applications targeted by the web-site are surface reconstruction, scene analysis, and building extraction and reconstruction. The first version of the web-site will be available on-line on the 1st of February 2002.

Contacts have also been taken with OEEPE to co-operate in the definition of evaluation protocols for building extraction and reconstruction.

Working Group News and Future Plans

2002

- Presentation of the Web-Site and the data basis at the ISPRS 2002 Commission III symposium in Graz.
- Completion of the data basis with a set of satellite stereo-images, a set of data for change detection, and a set of data for road detection and reconstruction.
- Definition of evaluation protocols through circular letters and technical meetings (Graz & Paris).
- Participation with OEEPE to the definition of evaluation protocols for a benchmark on building extraction and reconstruction.

2003

- Implementation of identified evaluation protocols.
- Delivery on the Web-Site of the evaluation software.
- Organisation by WGs II, IV and VIII of a commission III ISPRS workshop: "From Surface Reconstruction To Scene Analysis : Theory, Algorithms and Performance Evaluation" which will be held in Paris in the second week of July 2003.
- Participation to other workshops of Commission III to encourage papers and reflection on algorithm self-evaluation and management of uncertainty in complex systems.

IC WG III/V: IMAGE SEQUENCE ANALYSIS

Chair: Marc Pollefeys (Belgium)
Co-Chair: Guoqing Zhou (USA)

State of Science and Technology of Working Group Topics

Image sequence analysis has been playing an important role in many applications in computer vision, machine vision and robot vision and is also gaining interest in several fields of digital photogrammetry, especially in digital close-range photogrammetry. Examples of the application of image sequence analysis in digital close range photogrammetry are 3-D object tracking, the analysis of dynamic processes, deformation measurements, monocular or stereoscopic mapping of the environment of an autonomous robot, mobile mapping systems, biomedical motion analysis, 3-D data gathering for computer animation, and many others. Image sequence analysis techniques are also gaining interest in aerial photogrammetry in the context of automated triangulation techniques.

Sensor fusion and integration is of major importance especially in the field of mobile robots, where the information retrieved from vision systems is combined with data from other sensors like distance meters, odometers, inertial navigation systems or range images acquisition systems, but also plays a role in aerial triangulation, where INS and GPS are used as additional sources of data. The integration of rather different types of sensors requires a careful handling of redundant information and thorough error modelling.

New developments of hardware components are mainly related to the storage of digital image sequences and to the development of high-speed cameras. Digital video systems now coming onto the consumer market at very reasonable prices will considerably simplify the acquisition of monocular image sequences in the near future. The general increase of computer speed will allow real-time solutions for an increasing number of image analysis tasks in the future.

Accomplishments of the Working Group

- A web-site has been set-up for the working group: http://www.commission5.isprs.org/icwg.5_3
- IWG V/III participated in the organisation of VAST 2001 (Virtual Reality, Archaeology and Cultural Heritage) together with WG V/2 and WG V/4, and of the IEEE Workshop on Stereo and Multi-Baseline Vision (9-10 December 2001, Kauai, Hawaii).
- Tutorials/courses on 3D structure and motion recovery from image sequence were given at 3DIM 2001, SIGGraph 2001 and CVPR 2001.

Working Group News and Future Plans

- European Conference on Computer Vision 2002, 27 May - 2 June 2002, Copenhagen, Denmark.
- Workshop on Vision and Modelling of Dynamic Scenes, 2 June 2002, Copenhagen, Denmark.
- Photogrammetric Computer Vision (ISPRS Commission III symposium), 9-13 September 2002, Graz, Austria
- ISPRS Commission V symposium, 2-6 September 2002, Corfu, Greece.

TECHNICAL COMMISSION IV
SPATIAL INFORMATION SYSTEMS AND DIGITAL MAPPING

President: Costas Armenakis (Canada)
Scientific Secretary: Yuk-Cheung Lee (Canada)

State of Science and Technology of Commission Topics

The topics of the Commission cover wide and diverse scientific and applications fields. The complexity of spatial applications has significantly increased, and thus it requires knowledge-based solutions, while it is becoming apparent that the separation between geo-spatial applications from their theoretical aspects is not leading to optimal solutions. The Commission should evolve to cover the theory, technology and applications of the geo-related topics.

The smooth integration between data collected by air and space borne sensors with spatio-temporal databases is evolving. There is need to better define, understand and further investigate and develop the relations between image objects and the corresponding spatio-temporal databases to allow for transparent integration of imagery in spatial information systems including image-based databases and content-based image retrieval.

Imagery is not only regularly used as one of the most important thematic layers in the geographic information systems but is also used in integrated 3D dynamic representations of the landscape engaging also the cognitive processes. As geospatial information systems are evolving from 3D to 4D modelling and representation, imagery and other sensors (i.e. SAR, LIDAR) significantly contribute through their multi-view/sensor geometry (3D) and through their multi-temporal coverage (4D).

The IKONOS-2 and QuickBird 2 satellites and the airborne digital sensor systems (e.g. ADS40) have renewed the interest in high resolution digital imagery. Besides the geometric aspects, automated processes for feature extraction using various image analysis techniques are strongly pursued. Texture-based segmentation as well as object-oriented segmentation and classification are being investigated to deal with the changes in spectral response from pixel to pixel in high resolution imagery. There is also increased interest for 3D determination and the DEM extraction due to the along track capabilities of these sensors as well as from airborne SAR and LIDAR altimetry mapping.

Activities such as change detection and database updating are high in the agenda in many organisations as they do not solely serve topographic revision operations but tracking and monitoring purposes as well including spatio-temporal analysis based on images-based change detection. Integration of imagery, geospatial theories and analysis procedures are required to quantify spatial trends, processes, correlations and patterns. Regarding the spatio-temporal modelling and analysis the work is directed towards a) modelling data or object-classes (including their operations) using formal languages and formalism (e.g. UML), and b) modelling processes (natural or not) involving spatial data using algorithmic approaches and formal rules. Work also continuous into the investigation of database-based driven processes. Rapid operations for data acquisition, processing and visualisation are more and more in demand aiming at 'mapping on-the-fly'. Landscape modelling, visualisation and VR are becoming the means for digital mapping.

The complexity of applications requires integration and fusion of the heterogeneous geodata. Digital geospatial frameworks are expanding in local, regional and global levels, thus increasing the interest for geospatial interoperability and in distributed and large databases. Geospatial frameworks for critical infrastructures are being developed to deal with sustainable development and emergency mapping and management. Theory, rules and tools need to be developed and tested for image fusion as well as for the vertical and horizontal integration of geodata, including tools for access, integration and fusion geospatial data as well as data aggregation and data mining. Management of data quality is necessary. National topographic organisations are moving in to object-oriented topographic databases and in to the establishment of National GeoSpatial Infrastructures.

The web-based developments are moving beyond web mapping (delivery of a map image via the web) to web feature manipulation allowing dynamic access and exploitation of vector data and their attributes. Particular attention should be paid to the activities and development of ISO/TC211, OGC (OpenGIS Consortium) and GITA (Geospatial Information and Technology Association, former AM/FM International).

Extraterrestrial mapping activities moved beyond the mapping of the Mars and include mapping of asteroid 433 Eros and of comet Borrelly.

Today geo-information is used in many areas and in many ways both locally and globally. Its use has been expanded beyond traditional topographic mapping and spatial applications. We see it being used to support sustainable development, in geo-spatial infrastructures, resource management, environmental databases and assessments, mobile mapping and location based services, tourism, agriculture, disaster relief, communications, insurance, real estate, and entertainment just to mention few, while issue-oriented approached are gaining momentum. Commission IV must stand to the challenge and lead in these new developments.

Accomplishments of the Commission

The efforts of the Commission during its first year were focused on promoting and facilitating the scientific and technical activities of the Working Groups according to their respective terms of references, on establishing co-operation and synergy among the WG of the Commission and with other Commissions, on establishing co-operation with other geospatial societies and on starting the preparations for the mid-term Symposium of the Commission.

As it can be seen from the working groups activities, the working groups of the Commission have been quite active and organised, co-organised and contributed into a number of scientific events. The events of September 11 naturally had a significant effect on two US held workshops. Lone of them, organised by WG IV/9, was cancelled and is held as "virtual workshop". WG IV/8 continues its work on publishing Volume 2 of the book on Global Environmental Databases, while WG IV/1, WG IV/6 and WG IV/7 are preparing special issues for the ISPRS Journal.
Commission IV and its Working Groups co-operated with other spatial societies, such as the ICA (WG IV/3 and WG IV/9), CEOS (WG IV/8), FIG Commission 3 (Commission IV), CIPA WG 8 (WG IV/7), OEEPE (WG IV/1 and WG IV/3) and the IGU Commission on Geographic Information Science (joint Symposium in 2002). It is also involved with international initiatives such as the Global Mapping project (WG IV/8), and sponsored and participated in events such as MARISY 2000, 3rd ISPRS Workshop on Dynamic and Multidimensional GIS (May 2001), ASIA GIS (July 2001), and the International Conference on Spatial information for Sustainable Developments (organised by FIG, ISK and UN Centre for Human Settlements, October 2001).

The preparations for the mid-term Symposium of the Commission are in progress. It will be held jointly with the 10th Spatial Data Handling meeting. This collaborative event, which also includes the Annual Conference of the Canadian Institute of Geomatics, will foster closer relations and provide opportunities for greater interaction among the geomatics communities involved in research, development, applications and management of geo-spatial data and information. More than 180 extended abstract proposals have been submitted to Commission IV.

Working Group Activities during the Current Year

WGIV/1: SPATIAL AND TEMPORAL DATA MODELLING AND ANALYSIS

Chair: Yvan Bédard (Canada)
Co-Chair: Wenzhong (John) Shi (Hong Kong)

State of Science and Technology of Working Group Topics

There is a lot of research and development taking place in the area of Spatial and Temporal Data Modelling and Analysis. These activities are taking place mainly into two directions: modelling data or object-classes (including their operations) using formal languages and formalisms (e.g. UML) and modelling processes (natural or not) involving spatial data using algorithmic approaches and formal rules. Among the issues still under investigation are (1) the fundamental concepts used to describe space and time, especially in the context of multidimensional databases, (2) the development of spatial and temporal extensions to traditional formal language or formalisms in order to facilitate the design and development of spatio-temporal databases, either in transactional or in multidimensional systems, (3) more efficient techniques and improve their performance but also their ease of use and intuitiveness, (4) methods to better describe 3D models as well as the operations performed on these models and their implication on spatio-temporal analysis, (5) shifting from a traditionally transaction-based paradigm to an analysis-based paradigm better geared for spatio-temporal exploration and decision-support, or in other words from the traditional monoscale normalised spatio-temporal data models to the more recent multi-scale denormalised multidimensional data models where parallel space and time dimensions may coexist as well as several levels of information granularity (in order to support all levels of decision-making), and (6) innovative methods and techniques to deal with the spatial, temporal and thematic quality of data, especially methods that are better suited for the end-user or that are more powerful to express the quality of the data. All these issues pose important challenges both to fundamental researchers as well as to applied researchers. Relationships with and limitations of today's solutions to find that today's methods and technologies are still very limited with regards to all these issues. However, their underlying inherent complexity pose major challenges in terms of fundamental concepts and of practical feasibility, creating the need for such R&D activities.

Accomplishments of the Working Group

The year 2001 has been a year of renewal for the WG. After the arrival in September of 2000 of a new team to chair and co-chair the WG and some time of adaptation, new activities have taken place. Although some of these activities will really bear fruit only in 2002, the following have taken place during 2001:

- Completed the revision of the terms of reference of WG IV/I as well as to the renewed Terms of reference of Commission IV (end of 2000)
- Planning of activities for years 2001, 2002, 2003 and 2004.
- A web site has been built especially for the WG IV-1. It is similar to the ISPRS and Commission IV sites but provides information more specific to IV-1 (ex. Members, terms of reference, activities, links of interest and a forum). In particular, this web site will serve to attract WG1 members, strengthen networking and build an official list of members of the WG (this list can be used for further contacts and to email information about our activities). The site is practically completed and is being tested before being publicised (planned for February 2002). The site present address is http://sirs.scg.ulaval.ca/isprs_wg4-1/default.asp
- The WG will contribute to the paper reviewing process for Commission IV of the joint symposium between ISPRS Commission IV, SDH (Spatial Data Handling) and CIG (Canadian Institute of Geomatics) to be held in Ottawa in July 2002. Also, members of WG IV/1 submitted several papers.
- The WG will participate in the organisation of the incoming (March 2002) joint OEEPE/ISPRS Workshop on Spatial Data Quality Management organised by the Istanbul Technical University, Division of Photo-grammetry, and the General Command of Mapping, National Mapping Agency of Turkey, Ankara. Also participation to the presentation of papers.
- Co-organisation of the 3rd ISPRS Workshop on Dynamic and Multi-Dimensional GIS and 10th Annual Conference of CPGIS on Geoinformatics, May 23-25, 2001, Bangkok, Thailand.
- A half-day tutorial entitled "UML for Modelling Spatial Database Application" is being prepared to be offered at the joint symposium in Ottawa (see above).
- Preparation of a proposal for a Special Issue of the ISPRS Journal, jointly with Commission II, on "3D Spatio-Temporal Modelling and Analysis".
- Co-operation with other groups and organisations: ISPRS Comm.IV WG's, ISPRS Comm II, OEEPE, SDH (Spatial Data Handling), CIG (Canadian Institute of Geomatics), CPGIS (Chinese Professionals in Geographic Information Systems)

Working Group News and Future Plans

- January 2002: finalise the feeding and testing of WG IV/1 web site
- February 2002: initiate action to attract membership to the WG IV/1 (the web site will strongly support this action)
- February 2002: submit the proposal for an ISPRS Journal Special Issue, with Commission II, on "3D Spatio-Temporal Modelling and Analysis"
- March 2002: Participation to the OEEPE Workshop on Spatial Data Quality Management organised by the Istanbul Technical University, Division of Photogrammetry, Istanbul and the General Command of Mapping, National Mapping Agency of Turkey, Ankara.
- October 2-3, 2003: workshop of WG IV/1 to be held at Laval University Centre for Research in Geomatics in Quebec City, Canada.
- Technical Sessions during the ISPRS congress in 2004, Istanbul, Turkey.

Address Updates of WG IV/1 Chairs

Chair: Yvan Bédard
Web: http://sirs.scg.ulaval.ca/yvanbedard

WG IV/2: FEDERATED DATABASES AND INTEROPERABILITY

Chair: Jianya Gong (China)
Co-Chair: Rolf A. de By (The Netherlands)

State of Science and Technology of Working Group Topics

The concept of the federated spatial databases is evolving to deal with autonomous systems. Interoperability is expanded into distributed object environments as well as in dealing with the semantic aspects (semantic interoperability, geosemantic proximity). Web-based mapping is evolving to web-based data manipulation, while e-commerce type of applications is being adapted by national organisations.

Accomplishments of the Working Group

- WG IV/2 co-organised Geoinformatics & DMGIS'2001 at AIT, Bangkok, Thailand, May 23-25, 2001 together with The Association of Chinese Professionals in Geographic Information systems (CPGIS), ISPRS WG II/3 "Integrated systems for spatial Information Services", ISPRS WG II/5 "Design and operation of spatial decision support systems", ISPRS WG II/6 "Image-based Systems for Spatial Analysis and Visualisation", ISPRS WG IV/1 "Spatial and temporal data modelling and analysis", ISPRS WG V/5 "Quick response and distributed computing for close-range applications", Asian Institute of Technology (AIT) and the National Key Lab, for Information Engineering in Surveying, Mapping and Remote Sensing (LIESMARS). Prog. Gong Jianya, Chair of WG IV/2 and Miss Shi Lite, Secretary of WG IV/2 submitted papers and attended the conference. During the conference, they held a session related to "Federated Databases and Interoperability" with four papers submitted. The conference went on successfully with about 60 scholars and professionals in attendance.
- "International Workshop on the Map and Internet" was held in Guangzhou, China, August 30-31, 2001 together incorporated with ICA Commission "Map and Internet". After the workshop, a two-day trip to Wuhan University was led by Prof. Gong Jianya and Miss Shi Lite with 12 scholars from USA, Canada, Australia, Finland, Austria and Philippines.
- The WG IV/2 web was finished in October 2001. You may visit the web-site at http://www.geostar.com.cn/wgweb/homepage.htm or http://www.commission4isprs.org/wg2. Links to ISPRS and other relevant web-sites are established.

Working Group News and Future Plans

The working group is seeking to expand its WG membership. Now it has 12 members. An online registration form is established on the WG web-site. Anyone who is interested in joining us may register online or submit a paper application (in preparation). A joint workshop "International Workshop on Mobile and Internet GIS" is planning to be convened in Wuhan University, China, August 15-16, 2002 with other ISPRS WGs. The first announcement is in preparation and is to be released soon on the website and by mails.

WG IV/3: DATA GENERALIZATION AND DATA MINING

Chair: Monika Sester (Germany)
Co-Chair: Dianne Richardson (Canada)

State of Science and Technology of Working Group Topics

Diverse aspects related to the topics of the WG have been addressed in the workshops mentioned below. Among others these are issues of the automatic generation of different aggregation levels of spatial data. Such techniques are related to cartographic presentations of static maps, moreover, however to the presentation of interactive visualisations in the Internet. Furthermore, these issues are relevant for the updating of spatial data sets through different generalisation levels.

Accomplishments of the Working Group

A WG-web-site has been established, introducing the aims of the Working Group, as well as diverse links, activities, and a gallery of related projects (www.ikg.uni-hannover.de/isprs)

The Working Group has participated in the organisation of two Workshops:

- 8-10 October, 2001: Joint OEEPE / ISPRS workshop, Hanover, Germany – From 2D to 3D – Establishment and Maintenance of National Core Geospatial Databases. The slides of the presentations can be found under http://www.ipi.uni-hannover.de/isprs-wg2-_4/oeepe-isprs-2001.html
- 29-31 October, 2001: Joint Workshop with ISPRS WG IV/6 "Challenges in Geospatial Analysis, Integration and Visualisation", Athens, Georgia, USA, http://www.crms.uga.edu/wg_iv6/joint_workshop.htm

Furthermore, one of the chairpersons, Monika Sester, co-organised and participated in the Workshop of the Commission on "Map Generalisation" organised prior to the ICC in Beijing (1-3 August, 2001). To establish links with ICA is one of the WG's ToR. These links are on a good track, especially, since one of the chairs of the WG, Dianne Richardson, is also chair of the Commission on "Map Generalisation". Also, there is a close involvement in the organisation of the Spatial Data Handling Symposium. This ensures that the subjects relevant for diverse communities are identified and common research activities can be planned. Such topics are multi-scale approaches, 2D and 3D-visualization, as well as interpretation of spatial data sets.

Working Group News and Future Plans

- 9-11 July 2002: Organise and hold sessions related to the topics of the WG during the ISPRS Symposium in Ottawa, Canada. Currently, a total of 16 abstracts have been submitted to the WG.

- 7-8 July2002: As a pre-conference to the ISPRS/SDH/CIG-Symposium in Ottawa there will be a workshop on "Multi-Scale Representations of Spatial Data". The workshop will be organised jointly between the ISPRS Working Group IV/3 of Commission IV and the ICA Commission on Map Generalisation (CMG). The aim of the workshop is to bring together experts from different disciplines working on multi-scale aspects of spatial data (Cartography, Image Interpretation, Visualisation, etc.). There will be a focus on the elaboration of mutual use of the techniques and methods developed in the respective disciplines, and thus explore commonalties between the different domains.

WG IV/4: SPATIAL DATA INFRASTRUCTURES

Chair: Parth Sarathi Roy (India)
Co-Chair: David Holland (UK)

State of Science and Technology of Working Group Topics

Specialised and critical infrastructures are put in to place to serve specific applications such as location-based services, mobile GIS, biodiversity, population management, cyber cities and emergency/disaster management. Geospatial data infrastructures are expanding to include the height layer. Handling of metadata for warehouses is facilitated with the developments of integrated web catalogue services, while modelling of multiple representations into spatial warehouses is investigated to handle various scales. For the expansion of large databases the concepts of incremental approaches can support the redefinition of database schema.

Accomplishments of the Working Group

The WG has so far 4 members.

The WG organised a workshop within the objectives of the working group entitled "Spatial Data Infrastructure for Disaster Management" during the National Symposium of Indian Society of Remote Sensing at Ahmedabad, India from on 13th December 2001. The main themes for discussion during the workshops were

- Priorisation for SDI for Disaster Management
- Quality Evaluation Procedures and Standardisation of SDI
- Data exchange policies and Networking of Institutions for virtual Spatial Data Warehousing

Working Group News and Future Plans

A workshop on "Spatial Data Infrastructure for Sustainable Natural Resource Management" will be held during the ISPRS TC VII symposium at Hyderabad, India from 3rd to 6th December 2002.

WG IV/5: IMAGE-BASED GEOSPATIAL DATABASES

Chair: Peggy Agouris (USA)
Co-Chair: Dimitris Papadias (Hong Kong)

State of Science and Technology of Working Group Topics

The activities of this WG extend beyond photogrammetry and image analysis into the intersection of GIS and databases. Major advancements in these fields are commonly becoming available in the major conferences of these communities, including VLDB (Conference on very large Databases), DEXA (Databases and Expert Systems Applications), and PODS (Principles of Database Systems).

Trying to summarise this year's advancements in databases, the following issues can be identified as dominant:

- Content-based queries of geospatial datasets.
- Spatio-temporal analysis (especially image-based change detection).
- Modelling database content and communicating this information to multiple users in various modalities.
- Digital libraries and web-based GIS environments.

As an indication of the current state-of-practice in this area, the recent events in New York emphasised the upgraded role of digital imagery in both extracting and communicating geospatial information. In an invited tour of the Manhattan Emergency Centre of Operations, the WG Chairperson had the opportunity to witness the production cycle established to provide support for emergency personnel, rescue operations, and overall co-ordination of activities. Digital imagery captured by satellites and helicopters flying over lower Manhattan immediately after 9/11, and annotated by expert analysts, substituted the by then obsolete maps of that area.

Working Group News and Future Plans

For 2002 the main focus of our activities will be the Commission IV Symposium.

During 2001, the WG Chair (together with the Chair of WG V/5) managed to attract funding by the US National Science Foundation (NSF) to hold a workshop in 2003 in the US (most likely in New England). We will begin with workshop announcements and will contact publishing houses within 2002.

WG IV/6: LANDSCAPE MODELLING AND VISUALIZATION

Chair: Marguerite Madden (USA)
Co-Chair: Jochen Schiewe (Germany)

State of Science and Technology of Working Group Topics

During the Workshops reported below the following topics were identified as being the most important to be addressed:

- Integration of geospatial theories and analysis procedures into GIS packages to address the analysis of GIS data sets (i.e. procedures to quantify spatial trends, processes, correlations and patterns).
- Developments of intelligent/transparent GIS procedures for lineage tracking, user notification of opera-

tions suitable for particular data types, creating/using metadata, quality-fitness of data for targeted uses).
- New theories, models and techniques for high-resolution data including model-driven interpretation, multi-scale/hierarchical analysis, fuzzy spatial objects and application-dependent procedures.
- Better incorporation of prior knowledge for the analysis of remote sensing data and remote sensing/GIS integration.

In summary it is hoped that the discussions of the October 2001 Joint Workshop held in Athens, Georgia will be continued among the workshop participants via the Internet over the coming months. Plans are underway for members of the four Commission IV Working Groups to meet again at the Commission IV Symposium to be held 9-12 July, 2002 in Ottawa, Canada.

Working Group News and Future Plans
The WG will be responsible for a special issue of the ISPRS Journal of Photogrammetry and Remote Sensing. There is a Call for Papers for this special issue, entitled: "Challenges in Geospatial Analysis and Visualisation". Guest editors: Marguerite Madden, Center for Remote Sensing and Mapping Science, University of Georgia, USA, and Jochen Schiewe, Institute for Environmental Sciences University of Vechta, Germany. The planned publication date is December 2002

This issue of the ISPRS Journal of Photogrammetry and Remote Sensing is focused on the use of innovative techniques for geospatial data analysis and visualisation. As an outgrowth of a Joint ISPRS Working Group Workshop held in Athens, Georgia, in October of 2001, topics of the theme issue are related to the resolutions of ISPRS WG IV/3 (Data Generalisation and Data Mining), WG IV/5 (Image-Based Geospatial Databases) and WG IV/6 (Landscape Modelling and Visualisation).

WG IV/7: DATA INTEGRATION AND DIGITAL MAPPING

Chair: Michael Hahn (Germany)
Co-Chair: Ryosuke Shibasaki (Japan)

State of Science and Technology of Working Group Topics
Overall WG IV/7 contributed quite a number of high quality papers to the symposium mentioned below and workshop focussed on investigations on various aspects of air- and spaceborne image data integration. IKONOS stereo and multi-spectral imagery was of special interest for high resolution mapping investigators and quality aspects of pan-sharpening and other integration issues have been addressed. The successful launch of the QuickBird satellite this year and also the new digital airborne camera systems will certainly further increase the interest in high resolution topographic, thematic and 3D urban mapping.

3D data and data bases, internet developments and its relation to 3D virtual reality applications may lead to a number of new issues in the area of data fusion at image, feature and information level. VR of landscape and city models integrates multiple resolution raster and vecto data and requires homogeneity about scale, radiometric and geometric properties of the data. Interactive communication with the VR environment and streaming of those data over the Internet introduce new conditions and lead to new challenges in the area of data integration.

Accomplishments of the Working Group
A Web page (http://www.fht-stuttgart.de/fbv/fbvweb/priv/hahn/c4_wg47.htm) has been set up which gives details about the current WG activities. Further, the WG objectives and the forthcoming events support by the WG are announced on this page.

With circular letters the WG informed its 60 WG members about the following activities:
- A symposium on ASIA GIS 2001 was organised by Ryosuke Shibasaki in Tokyo, 20 - 22 June, 2001. About 90 papers were presented covering topics like spatial analysis, land use/cover, mobile and web GIS, and relatively new topics like spatial IT, GXM-L, pseudolites. Around one fifth of these papers was closely related our TOR.
- Michael Hahn contributed to the organisation of a joint workshop of WGs I/2, I/5 and IV/7. This workshop on High Resolution Mapping from Space was held on 19.09.-21.09.2001 at the university of Hanover. WG members actively participated to this workshop with presentations related to topographic mapping, data integration and visualisation of fused image data. The table of contents of the proceedings can be found on our home page.
- The WG chairmen contributed to the preparation of a joint workshop of working groups IV/3, IV/5, WG IV/6, WG IV/7 "Challenges in Geospatial Analysis, Integration and Visualisation" in Athens, Georgia, October 2001. The unsettled situation after September 11 was a major reason why active participation of our WG was not feasible.

Working Group News and Future Plans
The major upcoming WG IV/7 activity for 2002 will be the midterm symposium of Commission IV on 'Geospatial Theory, Processing, and Applications'. Around 30 abstracts related to our WG have been submitted and the review and assignment to sessions will be finished by the end of December 2001.

WG IV/8: GLOBAL ENVIRONMENTAL DATABASES

Chair: Ryutaro Tateishi (Japan)
Co-Chair: David Hastings (USA)

Accomplishments of the Working Group
The main activity of the current year was to prepare drafts for the book titled "Global Environmental Databases,

Volume 2" which will be published at the time of Commission IV Symposium in July 2002. This book publication is the continuing activity from the previous WG IV/6 (Global Databases for Environmental Monitoring) during 1996-2000 which published the so-called Volume 1 book of "Global Environmental Databases" (available from http://www.geocarto.com/B001.html or http://www.amazon.com). The Volume 2 includes chapters on climatic data, land use data, land cover biophysical data, livestock data, disaster data for the specific data and chapters on spatial information infrastructure, cultural bias, meta data for the common subjects. The background of this book publication activity is based on the recognition of the awareness for the present situation of the development of global environmental databases, that is the lack of harmonisation/standardisation among various efforts of the database development.

Another activity is the discussion through "The Virtual Workshop on Data Issues" (http://hypernews.ngdc.noaa.gov/HyperNews/get/virtual.html).

In addition to the above activities, the co-operation with the Committee on Earth Observation Satellites (CEOS) Working Group on Information Systems and Services (WGISS) Global Datasets Task Team is going on to develop "the Portal to Global Environmental Datasets" http://www.ngdc.noaa.gov/seg/tools/gis/portalhome.html. In addition, the Global Mapping Task Team of CEOS is working on a book project on map projections, somewhat modelled after the books on Global Environmental Databases (several of the principles of the CEOS book project participated in the ISPRS book project workshop). Our Working Group hosted two workshops on the CEOS projection book project.

Furthermore the co-operation with "Global Mapping" project (http://www1gsi.go.ip/iscgm-sec/index.html) on the theme of the development of land cover ground truth database has started.

In addition, we have been exploring fostering additional research on new methods of topographic mapping, such as the Shuttle Radar Topography Mission, and LIDAR topography. This work is being explored with the CEOS Terrain Mapping Subgroup, and the CEOS Global Datasets Task Team.

WG: IV/9: EXTRATERRESTRIAL MAPPING

Chair: Randy L. Kirk (USA)
Co-Chair: Jan-Peter Muller (UK)

State of Science and Technology of Working Group Topics

The past year has seen the completion of several unprecedented datasets for extraterrestrial mapping and the initiation of plans that will result in even more spectacular observations in the coming half-decade. In February 2001, the NEAR-Shoemaker spacecraft ended its one-year exploration of asteroid 433 Eros by obtaining images with centimetre resolution and then gently landing on the surface. Over the course of the mission, 160,000 images were returned, permitting the Multispectral Imager team to construct a highly detailed digital shape model and global image mosaics. Many of the highest resolution images, including significant stereo coverage, have yet to be exploited for mapping. The NEAR Laser Rangefinder obtained global ranging data that provide an independent estimate of the shape of Eros and elucidate small-scale topographic features. In contrast with the length NEAR mission, the September flyby of comet Borrelly by the Deep Space 1 probe was over in a matter of minutes, but the MICAS imager on board succeeded in obtaining images of the 8-km-long nucleus with resolutions as good as 50 m and excellent stereo convergence. These images support not only geologic interpretation but also first-ever quantitative topographic mapping of a comet nucleus.

The Mars Global Surveyor spacecraft completed its primary mission in January and entered mission phase, one of the main goals of which is for the Mars Orbiter Camera to obtain numerous high-resolution (1.5 to 3 m/pixel) images, including stereo coverage, of candidate landing sites for the 2003 Mars Exploration Rovers. In June, the Mars Orbiter Laser Altimeter (MOLA) ceased mapping after obtaining 640 million measurements of the martian surface and atmosphere. The absolute accuracy of the MOLA dataset, after a global adjustment based on orbit track crossings, is believed to be <10 m vertically and ~100 m horizontally, making it the primary standard for martian geodetic control for the foreseeable future. Mapping Scientists should expect plenty of high-resolution images to tie to this control. In early November, the 2001 Mars Odyssey spacecraft successfully entered orbit and tested its THEMIS camera, which will image a large fraction of the planet with up to 18 m/pixel resolution in several visible wavelengths and obtain global infrared imager at 100 m/pixel. Also in November, NASA announced the selection of the HiRISE camera for its 2005 Mars Reconnaissance Orbiter. This instrument is intended to combine ultrahigh resolution (0.25-0.5 m/pixel) with large image size (typically 20,000x40,000 pixels). Like the Mars Orbiter Camera, it will be pointed off-nadir part of the time to permit stereo-mapping.

Accomplishments of the Working Group

The major event planned by the Working Group in 2001 was a Workshop/Symposium on "Planetary Mapping 2001" to be held at the U.S. Geological Survey facility in Flagstaff, Arizona in mid-October. The title expressed the deliberate broadening of scope compared to past "Mapping of Mars" workshops, in part because of the extraordinary success of the NEAR mission. In addition to oral and poster sessions, the two-day workshop was to include a roundtable discussion on mappers' needs for orientation data and related software, led by Chuck Acton of NASA's Navigation Ancillary Information Facility (NAIF).

Unfortunately, in the wake of the September 11 terrorist attacks, restrictive travel policies and conflicts with other meetings being rescheduled forced a majority of speakers to cancel their plans to attend the workshop. The WG considered rescheduling the event, but could not find a suitable date given the many other scheduled (and rescheduled) meetings in the fall quarter. The workshop was therefore cancelled as a physical meeting, but participants were invited to share their research through a "virtual workshop" to be hosted on the WG web-site (http://www.flag.wr.usgs.gov/USGSFlag/Space/Isprs/index.html; follow the "Meetings" link). Authors who had contributed short abstracts for the meeting were invited to expand these into mini-papers and/or to supply electronic presentations. Contributions received by the end of November will be included on the site shortly thereafter. The workshop authors were also strongly encouraged to report on their research in an Extraterrestrial Mapping session at the 2002 Commission Symposium.

A particularly significant paper submitted to the workshop by Thomas Duxbury (JPL) and colleagues concerns efforts of the NASA Mars Geodesy/Cartography Working Group chaired by Duxbury to determine authoritative values of cartographic constants for Mars. Members of the NASA group (which has considerable overlap with the ISPRS WG) used Mars Global Surveyor MOC and MOLA data to define a reference ellipsoid and prime meridian for Mars with uncertainties of a few hundred meters or less. They also recommend the use of previously published rotational parameters based on tracking of the Viking and Mars Pathfinder landers. All of these parameter estimates, which have been transmitted to the International Astronomical Union (IAU) and will appear in the forthcoming report of the IAU/IAG Working Group on Cartographic Coordinates and Rotational Elements of the Planets and Satellites, are unlikely to be superseded in the coming decade. Finally, the NASA WG strongly recommends the use of planetocentric latitude and east longitude as a single coordinate system for future Mars cartographic products. This recommendation is currently under review by NASA.

WG Chair Randy Kirk attended the International Cartographic Congress in Beijing in August and delivered a paper in the planetary mapping session on current USGS efforts to revise the control networks and global maps of Mars and the Galilean satellites of Jupiter, including the suggestions for Mars cartographic coordinates and coordinate system just described. In discussions with the International Cartographic Association Commission on Planetary Mapping, chaired by Dr. Kira Shingareva (Moscow State University), Kirk renewed the agreement to pursue joint activities of the ICA Commission and the ISPRS WG. A glossary of planetary mapping terms is now partly completed, with the ICA members supplying definitions of planetary geologic terms that may be new to cartographers and the WG to define cartographic and photogrammetric terms for geologists. When complete, this material will also be added to the WG web-site.

Working Group News and Future Plans

An extensive revision of the ISPRS-ET web-site has already started and is the main activity planned for the near future. The USGS has taken primary responsibility for maintenance of the site, so that the URL given above is now the primary site; reestablishment of a European mirror site at the University College London is planned for the near future. We have begun the long-anticipated creation of an archive of planetary DEMs and orthophotomosaics on the site (follow the "Products" link), starting with a series of USGS 1:500,000-scale topographic maps of Mars compiled from Viking Orbiter imagery. A substantial backlog of USGS and other Mars DTMs at a variety of scales will follow, as well as maps of the Moon and Venus. We will also be redesigning the site to comply with U.S. Government accessibility requirements, and adding links to other sites relevant to the Working Group, such as the Planetary Interactive GIS-on-the-Web Analysable Database (PIGWAD) at http://webgis.wr.usgs.gov.

TECHNICAL COMMISSION V
CLOSE-RANGE AND VISION TECHNIQUES

President: Petros Patias (Greece)
Secretary: Alexandra Koussoulakou (Greece)

State of Science and Technology of Commission Topics

Following the developments and debates of the last two years regarding the interdisciplinary character of the Commission (see Annual Reports of 1999 and 2000), "Close Range and Vision Techniques" emerged as a title describing in the most representative manner the state and the activities of Commission V. Methods and techniques in close range have become a widely adopted measurement tool in industrial metrology, machine and robot vision, medical science, archaeology, architecture and construction management. Digital imaging and recording technology innovations, on the other hand, have spanned a wide scientific spectrum over the last few years, offering a significant opportunity for Commission V to broaden its focus and become more interdisciplinary in its activities. These are summarised in the Commission's Terms of Reference; a more detailed view is provided by the current and planned activities of the Working Groups, which follow.

Working Group Activities during the Current Year

WG V/1: AUTOMATION FOR VISION METROLOGY SYSTEMS AND INDUSTRIAL APPLICATIONS

Chair: Stuart Robson (UK)
Co-Chair: Thomas Luhmann (Germany)

State of Science and Technology of Working Group Topics

Photogrammetrists have solved the key issues associated with point measurement and multi-photo geometries and are able to demonstrate accuracy, precision and reliability for all but the most stringent of tolerances. There is a need to build upon these skills by increasing our exploitation of new algorithms and ideas most notably from machine vision, computer graphics and animation.

On the hardware side, we are seeing a mass market driven increase in the abilities of both CCD and CMOS imaging systems that, coupled with increasingly powerful low cost CPUs and memory, can begin to provide more integrated, automated and above all user-friendly photogrammetric measurement systems able to directly deliver answers, such as pose or strain, rather than simply coordinates.

A key example of this state of our science and technology is line photogrammetry where the next goal is to deliver accurate reconstructions of complex objects. Here the basic concepts have been proven and adopted, but there is significant new work required, both in the algorithms required and in our ability to acquire images not only with an appropriate imaging geometry, but also with an appropriate quality.

The last few years have seen a move by many established vision metrology research workers into industry, either being employed by existing companies or forming new companies and consultancies. This trend, particularly in Europe, has resulted in a growth in industrial applications but a more Intellectual Property Rights oriented culture with much new work not being reported at any level of technical detail. Despite this close to market nature, we are in a healthy state with new researchers from other disciplines entering the field to complement those in industry who in turn are able to exploit new technologies as they become available.

In summary, the major influence over the duration of this working group can be expected to be brought about through the integration of a diverse group of researchers as the successes of point base photogrammetry are expanded through accurate and automated feature and surface based measurement.

Accomplishments of the Working Group

Seeing its principal activity as the organisation of technical meetings, the Working Group has been very quiet during 2001 because two established meetings that comprehensively cover the working group terms of reference were already organised:

SPIE supported Videometrics and Optical Methods for 3D Shape Measurement. 22-23 January 2001, San Jose, California. Directly of relevance to this WG were two technical sessions on calibration and performance evaluation, and sessions on single and multiple sensors, 3D shape measurement systems, object tracking and dense surface acquisition. Proceedings, edited by Sabry El-Hakim and Armin Gruen, are available as SPIE Volume 4309 (ISBN 0-8194-3987-8).

Participation in the Optical 3-D Measurement Techniques V conference in Vienna, Austria from October 1 to October 4, 2001. The working group chairmen both presented papers and the co-chair chaired a technical session at the extremely well attended and organised conference. This meeting, which has traditionally focussed on a cross discipline of the activities of Commission V, contained technical sessions on vision metrology; multi-sensor systems and machine guidance and new measurement techniques. Whilst laser-scanning technologies dominated the other technical sessions, the meeting still managed to draw many researchers and practitioners associated with our WG. Papers given at the meeting are available as conference proceedings, edited by Armin Grun and Heribert Kahmen. (ISBN 3-9501492-0-1).

An informal WG business meeting was held in Vienna in October, with the main topic being the planning of a working group technical meeting to be held in early 2003.

Working Group News and Future Plans

Plans for 2002 are centred on the participation of Working Group V/1 in the forthcoming Commission V Conference in Corfu.

Plans are on-going for a workshop meeting in 2003. This meeting, entitled "Vision Metrology Systems - Automation for Optical 3-D Measurements" will be held at University College London, between 14th and 16th of April. A first announcement of the meeting will be made in January 2002 and distributed by email. In addition to the traditional photogrammetric audience, strong support for this workshop is anticipated from researchers and practitioners in machine vision.

WG V/2: SCENE MODELLING AND VIRTUAL REALITY

Chair: Sabry El-Hakim (Canada)
Co-Chair: George Karras (Greece)

State of Science and Technology of Working Group Topics

The use of photogrammetry in modelling is now widespread as evident from papers in many symposiums organised by non-photogrammetrists. The most active application is culture heritage and architecture. Many examples

are becoming available over the past year using both photogrammetry and range sensors. In the visualisation area, the trend has shifted from expensive immersive CAVE-type systems powered by supercomputers to interactive desktop PC-powered systems. Research activities are focusing on increasing the level of automation of the whole process from data collection to model creation. Some success has been reported, particularly in the computer vision community. Under certain conditions, a model can be created fully automatically using uncalibrated cameras with approaches based on projective geometry and robust algorithms. However, to achieve the desired accuracy and effectiveness under various practical conditions, more efforts are still needed.
The working group has 48 active members. It maintains a web site with links to all the members web pages, relevant events, large collection of applicable links, and test data.

Accomplishments of the Working Group
The following Conference was organised by the WG during 2001:
- Videometrics and Optical Methods for 3D Shape Measurements VII, Part of SPIE Symposium on Electronic Imaging, 21-26 January 2001, San Jose, California.

Also, the WG co-Organised or co-operated on the following conferences:
- International Symposium on Virtual and Augmented Architecture (VAA01), June 21-22, 2001, Dublin, Ireland. Sponsored by University of Dublin, Trinity College, Edinburg University, and CAMERA project
- International Conference on Virtual Reality, Archaeology, and Cultural Heritage, VAST2001, 28-30 November 2001, Athens, Greece. Organised by the European Association for Computer Graphics-Eurographics.
- International Workshop: "Visualisation and Animation of Landscape" in connection with the International Year of the Mountains 2002, 26 February - 1 March 2002, Kunming, China, Asian Institute of Technology (AIT), Yunnan University, U. Tokyo, and ISPRS.

Working Group News and Future Plans
The following Conference will be held in 2002 and organised by the WG:
- Videometrics VIII, Part of SPIE Symposium on Electronic Imaging, January 2003, San Jose, California (date and location to be confirmed).

WG V/3: MEDICAL IMAGE ANALYSIS AND HUMAN MOTION

Chair: Frank van den Heuvel (The Netherlands)
Co-Chair: Hans-Peter Meinzer (Germany)

Accomplishments of the Working Group
At end of 2000 an active search for working group members was started. The number of members is still limited. Not many photogrammetrists are active on the topics of the working group and people from the medical field interested in the activities of the working group are reluctant to join. New members are expected to join after the publication of the theme issue of the ISPRS journal (August 2002), and the symposium (September 2002).

A working group web-page has been established (http://www.geo.tudelft.nl/frs/medical/isprs-wg.html). This page contains the terms of reference, the activities, and the list of members of the working group and links.

The chair is guest editor of the Journal of Photogrammetry and Remote Sensing theme issue "Medical Imaging and Photogrammetry", planned publication date: August 2002. Eleven papers have been submitted and are currently under review.

Working Group News and Future Plans
A tutorial is organised for the ISPRS symposium commission V titled "Medical Imaging meets Photogrammetry". September 2, 2002 in Corfu, Greece. The tutorial is expected to bring together experts from the medical and the photogrammetric field.

WG V/4: IMAGE ANALYSIS AND SPATIAL INFORMATION SYSTEMS FOR APPLICATIONS IN CULTURAL HERITAGE

Chair: Hirofumi Chikatsu (Japan)
Co-Chair: Gabriele Fangi (Italy)

State of Science and Technology of Working Group Topics
Digital imaging and recording technology innovations over the last few years have spanned a wide scientific spectrum, which has offered a significant opportunity for Commission V to broaden its focus and become more interdisciplinary in its activities. In particular, recently developed laser scanning technology will contribute greatly to issues such as real-time data acquisition, visualisation, 3D modelling and scene reconstruction for cultural heritage. On the other hand, the number of pixels of consumer digital camera are amazingly increasing by modern semiconductor and digital technology. There are 53 kinds of high resolution consumer digital cameras on the market which have more than 3 million pixels in Japan. These high resolution consumer digital cameras will contribute to low-cost system, and the use of Internet and VR technology also will contribute to spatial information systems.

Furthermore, high resolution satellite imagery for monitoring of archaeological sites, and integrated surveying techniques with GPS are expected.

The goal of this working group is to coordinate research and activities, through sharing test data, topics, publication news letter, and organising meetings and workshops that address those terms of reference. In pursuing this goal, the following activities took place:

Accomplishments of the Working Group
- A homepage and several sub-pages have been set up on the WWW (http://www.chikatsu-lab.g.dendai.ac.jp/wgv4/index.html)
- A seminar was held at Feb. 2001.
- WG V/4 co-organised the International Workshop on "Recreating the Past" - Visualisation and Animation of Cultural Heritage -which was held at Ayutthaya, Thailand, 26 Feb. – 1 March, 2001.
- WG V/4 co-organised the International Symposium on "Asia GIS 2001" in Tokyo, Japan, 20 –22 June, 2001.
- A news letter was distributed at Sept. 2001.
- WG V/4 had a technical Session in the "3rd International Image Sensing Seminar" in Gifu, Japan, 24 - 27.Sept. 2001.
- WG V/4 is co-organising the International Workshop on " Visualisation and animation of Landscape" which will be held at Kunming, China, 26 Feb. – 1 March 2002.

Working Group News and Future Plans
- Participation to the International Workshop on " Visualisation and Animation of Landscape" in Kunming/China (26 Feb. – 1 March 2002).
- Participation to the ISPRS Com. V Inter-Congress Symposium in Corfu/Greece (2-6, Sept. 2002).

WG V/5: QUICK RESPONSE AND DISTRIBUTED COMPUTING FOR CLOSE RANGE APPLICATIONS

Chair: Anthony Stefanidis (USA)
Co-Chair: Vincent Tao (Canada)

State of Science and Technology of Working Group Topics
This WG is addressing emerging technologies and their effects on traditional photogrammetric processes. This year, as in the last couple of years, we could identify the following few issues as dominant among the themes of this workshop:
- Advancements in camera technologies and wireless communications.
- Distributed geospatial libraries.
- Video image analysis.
- Spatiotemporal applications.
- 3-D GIS.

We feel that the last issue (demand for and capability to fully analyze 3-D GIS) is the one that will drive the practice in our WG's theme over the next few years.

Accomplishments of the Working Group
This year WG V/5 co-organised two workshops. On September 3-4, 2001 we co-sponsored (together with WG IV-5) a Special Track on Image-Based Geospatial Databases, during the workshop on Query processing and Multimedia Issues in Distributed Systems (QPMIDS'2001). The meeting was held in Munich, Germany. The workshop was held as part of the Annual Meeting on Databases and Expert Systems Applications (DEXA'01). Workshop proceedings (including special track articles) were published by IEEE Press. The DEXA conference program may be found at http://www.dexa.org/dexa01/. On May 23-25 we co-sponsored "Geoinformatics 2001", held in Bangkok, Thailand. The Conference was organised by CPGIS (The Int'l Association of Chinese Professionals in GIS) and ISPRS Commission II. A summary report on the event may be found at http://www.acpgis.org/newsletter0102/10th_cpgis_annual_meeting.htm.
We also established the WG Web page: www.spatial.maine.edu/~tony/ISPRSWGV5.html, with information on our activities and an on-line call for participation questionnaire.

Working Group News and Future Plans
For 2002 the main focus of our activities will be the Commission V Symposium.

During 2001, the WG Chair (together with the Chair of WG IV-5) managed to attract funding by the US National Science Foundation (NSF) to hold a workshop in 2003 in the US (most likely in New England). We will begin with workshop announcements and will contact publishing houses within 2002.

WG V/6: VISUALIZATION AND ANIMATION

Chair: Armin Gruen (Switzerland)
Co-Chair: Shunji Murai (Japan)

Accomplishments of the Working Group
The WG participated in the organisation of the following:
- February 26-March 1, 2001: International Workshop on Recording the Past - Visualisation and Animation of Cultural Heritage, Ayutthaya, Thailand.
- 5th Conference on Optical 3-D Measurement Techniques, Vienna, AUSTRIA. info.tuwien.ac.at/ingeo/optical3d/o3d.htm

Working Group News and Future Plans
The WG participated in the organisation of the following:
- WG V/6, International Workshop on Visualisation and Animation of Landscape, in Kunming, China, 26 February-1 March 2002.
- 23rd ACRS in Kathmandu, Nepal, December 2002: Workshop related to the "International Year of the Mountains 2002".

IC WG V/III: IMAGE SEQUENCE ANALYSIS

Chair: Marc Pollefeys (Belgium)
Co-Chair: Guoqing Zhou (USA)

State of Science and Technology of Working Group Topics
Image sequence analysis has been playing an important role in many applications in computer vision, machine vision and robot vision and is also gaining interest in several fields of digital photogrammetry, especially in digital close-range photogrammetry. Examples of the application

of image sequence analysis in digital close range photogrammetry are 3-D object tracking, the analysis of dynamic processes, deformation measurements, monocular or stereoscopic mapping of the environment of an autonomous robot, mobile mapping systems, biomedical motion analysis, 3-D data gathering for computer animation and many others. Image sequence analysis techniques are also gaining interest in aerial photogrammetry in the context of automated triangulation techniques.

Sensor fusion and integration is of major importance especially in the field of mobile robots, where the information retrieved from vision systems is combined with data from other sensors like distance meters, odometers, inertial navigation systems or range images acquisition systems, but also plays a role in aerial triangulation, where INS and GPS are used as additional sources of data. The integration of rather different types of sensors requires a careful handling of redundant information and thorough error modelling.

New developments of hardware components are mainly related to the storage of digital image sequences and to the development of high-speed cameras. Digital video systems now coming onto the consumer market at very reasonable prices will considerably simplify the acquisition of monocular image sequences in the near future. The general increase of computer speed will allow real-time solutions for an increasing number of image analysis tasks in the future.

Accomplishments of the Working Group
- A web-site has been set-up for the working group: http://www.commission5.isprs.org/icwg5_3
- IWG V/III participated in the organisation of VAST 2001 (Virtual Reality, Archaeology and Cultural Heritage, 28-30 Nov 2001, Athens, Greece) together with WG V/2 and WG V/4, and of the IEEE Workshop on Stereo and Multi-Baseline Vision.
- Tutorials/courses on 3D structure and motion recovery from image sequence were given at 3DIM 2001, Siggraph 2001 and CVPR 2001.

Working Group News and Future Plans
- European Conference on Computer Vision 2002, 27 May - 2 June 2002, Copenhagen, Denmark.
- Workshop on Vision and Modelling of Dynamic Scenes, 2 June 2002, Copenhagen, Denmark.
- Photogrammetric Computer Vision (ISPRS Commission III symposium), 9-13 September 2002, Graz, Austria
- ISPRS Commission V symposium, 2-6 September 2002, Corfu, Greece.

ISPRS TECHNICAL COMMISSION VI
EDUCATION AND COMMUNICATION

President: Tania Maria Sausen (Brazil)
Secretary: João Ávila (Brazil)

State of Science and Technology of Commission Topics
The status of the topics of the Commission are summarised in the following papers:

Sausen, T.M. et al, XIXth International Congress of Photogrammetry and Remote Sensing, Commission VI: Education and Communication, Photogrammetric Record, 17(97): 119-155 (April 2001);

Sausen, T.M.; Rivett, U.; Geomatics Education in Africa and South America; International Journal in the Geomatics Industry, GIM International, will be published in January 2002;

Sausen. T.M.; The China-Brasil Earth Resources Satellite(CBERS), Highlights Vol.6 Nº2, June 2001;

Singhal, A.; Internet Resources and Distance Learning, India (Report), Working Group Meeting of ISPRS TCVI/4New Delhi, India,; Highlights Vol.6 Nº2, June 2001;

Accomplishments of the Commission
The Commission President attended Map India 2001, 4th Annual International Conference and Exhibition on GIS, GPS and Remote Sensing, 7-9 February 2001, Taj Palace Hotel, New Delhi, India and presented a paper on Remote Sensing and GIS activities: Examples from Brasil, and chaired a Technical Session on Education. ISPRS TC VI/ WG VI-4 organised a meeting of its members, on February 10th, 2001 in New Delhi at Hotel Taj Palace to discuss on the proposed activities of this group during its tenure. On this occasion were also organised a Workshop on "Developing Education Campus on the Web for GIS and Remote Sensing.

The Commission President also attended the UN Expert Meeting on Regional Centres for Space Science and technology education, Affiliated to the United nations, and Their Education Curricula at ESA Headquarter, Frascati, Italy, 3-6 September 2001, which was followed by a CEOS WG Education Meeting.

Tania Maria Sausen also attended RSPS 2001 First Annual Meeting of the Remote Sensing and Photogrammetry Society, DTI Conference Centre, 1 Victoria Street, London, 12-14th September, 2001 and presented a keynote paper on ISPRS TC VI –Education and Communication Activities, and a technical paper on The China-Brazil Earth Resources Satellite (CBERS). She also attended Primeras Jornadas Uruguayas de Teledetección,

in Montevideo, Uruguay, 29-31 October, 2001,and presented a paper on ISPRS TC VI –Education and Communication Activities in Latin America

During the tea year TCVI co-organised in collaboration with Working Group WG VI/3, the TC VI Seminar "Education and Technology Transfer in Photogrammetry, Remote Sensing and Spatial Information Systems in Latin America", from 8 - 10 October 2001, at Porto Alegre, Brazil within the frame of 20th Brazilian Congress of Cartography, 8th Iberoamerican GIS Conference and the 9th National Congress of Rural Engineering.

Other activities include:
- Mid Term Symposium Organisation
- Letter sent to Brazilian Science Academy, concerning an ISPRS Application for Full Membership of ICSU

Working Group Activities during the Current Year

WG VI/1: EDUCATION AND TRAINING

Chair: Emmanuel Baltsavias (Switzerland)
Co-Chair: Theodoros Bouloucos (Netherlands)

Accomplishments of the Working Group

The WG was established and activated quickly. A WEB page was set up in late 2000 with much information, including a structured list of educational material, esp. freely accessible material on the WEB. Thousands of such links have been found, checked and shortly commented. Most of them have been placed on the WEB. Although this information is very useful, it has not been accessed to a satisfying degree (about 430 unique visitors from all around the world). The existence of this database should become more widely known especially within ISPRS. For this reason an announcement in the last 2001 issue of Highlights has been published. The WG contacted almost all educational institutions in our field and other persons and solicited membership. Currently, we have 30 members. The members were regularly informed via e-mail on the WG activities. Furthermore, we have propagated the Educator's Network and have sent relevant information, esp. on events and educational opportunities to it.

The WG co-organised in collaboration with Technical Commission VI President Tania Maria Sausen and WG VI/3 the TC VI Seminar "Education and Technology Transfer in Photogrammetry, Remote Sensing and Spatial Information Systems in Latin America", 8 - 10 October 2001, Porto Alegre, Brazil within the frame of 20th Brazilian Congress of Cartography, 8th Iberoamerican GIS Conference and the 9th National Congress of Rural Engineering. The programme included 4 opening introductory presentations, technical sessions (11 papers), a special session "Geotechnologies for urban studies" (2 papers), a round-table discussion "Education and Technology Transfer Exploring Opportunities for Networking with Similar Groups" which was very lively with many proposals and a tutorial "Map updating (1:50,000 and 1:25,000) using medium and high resolution remote sensing data and GIS", which was very successful and provided a wealth of material. A quite large and interesting technical exhibition and social events rounded up the programme. Speakers came from 11 countries, while a strong presence from Brazil and secondary Argentina among the participants was noticed, leading to a truly multinational discussion, often in Portuguese or Spanish. Our WG papers were dedicated to educational opportunities at post-graduation level in Photogrammetry, Cartography, Remote sensing and GIS. All papers from European and Latin American institutions were given. Based also on the discussions it was shown that there is a great need for such programmes, esp. at M.Sc. level, in L. America, which however should be easily accessible and adapted if possible to the regional needs. The Seminar can be judged successful with participation reaching partly up to 65-70 persons. Most material of the workshop is freely available at www.photogrammetry.ethz.ch/ general/persons/jana/isprs/poa_ brazil.html and was distributed on CD-ROM. The WG, with cooperation of WG VI/3 and UCLAS, Univ. of Dar es Salaam, is preparing another workshop "Developments and Technology Transfer in Geomatics for Environmental and Resource Management in Dar es Salaam, 25-27 March 2002. Details can be found at www.commission6.isprs.org/daressalaam/. Participation fees have been kept very low and we manage to get some financial support from the Council. Searching sponsors proved very difficult, showing a weak point where ISPRS should become more active, if activities in developing countries are to be supported. The WG has contributed to the preparations of the Com. VI Mid-Term Symposium and has distributed promotional material to its WG members. Some contacts with TCPs have been established with aim to support organisation of tutorials during the Mid-Term Symposia.

Working Group News and Future Plans

The activities for 2002 will focus on topics of our activity list (see our WEB page) not treated yet and on the 2002 events. Furthermore, we will start preparing events for 2003 in Asia. We also plan to extend our information database on our WEB site and extend it with search facilities trying to establish a searchable scientific database in our fields.

WG VI/2: COMPUTER ASSISTED TEACHING

Chair: Mark Shortis (Australia)
Co-Chair: Pierre Grussenmeyer (France)

Accomplishments of the Working Group

A new web site for ISPRS Working Group VI/2 has been established at http://geolier.eng.unimelb.edu.au/isprs6wg2/ and contains information on activities, terms of reference, resources and Computer Assisted Teaching contests (CATCONs). Some of the content for this web site was kindly provided by Dr. Kohei Cho, Chair of WG VI/2 during 1992-2000;

The FIG Commission 2 Working Group 2 workshop and seminar on the "Virtual Academy" held in Espoo, Finland during June 5-8, 2001 was supported by WG VI/2. More information on the workshop is available at http://ns.foto.hut.fi/fig/wg22.htm and includes a summary of the important issues identified during the workshop and a look forward to the matters to be discussed at the next meeting of the group;

WG VI/2 organised and participated in a "Special Session on Multimedia in Education" at the 5th Conference on Optical 3-D Measurement Techniques at Vienna, Austria, during October 1-3, 2001. This was the major activity of the year and comprised three presentations by Pierre Grussenmeyer and Pierre Drap, Barend Köbben, and Mark Shortis and Neil Woodhouse. The presentations covered a range of activities in photogrammetry, cartography and surveying, in accord with the general theme of the Optical 3D conference, but contained the common themes of computer assisted teaching, student-centric learning and flexible delivery. The session was moderated by the Chair of WG VI/2, drew an audience of 20-30 participants in competition with a parallel session, and generated some interesting discussion. The aims of the session were to raise the awareness of computer assisted teaching and flexible delivery in tertiary education, to establish a presence in the conference and expand the list of interested people. All three aims were achieved to varying degrees, however this process of participation in appropriate conferences must continue.

Working Group News and Future Plans

ISPRS WG VI/2 will be involved in technical sessions on computer assisted teaching, student-centric learning and flexible delivery during the Mid Term symposium of TC VI in São José dos Campos, Brasil, September 16-18.

The current web site will be expanded with additional links to resources available on the Internet. The list of active members of ISPRS WG VI/2 will be established and also published on the web site. Liaison with FIG WG 2.2 will continue wherever possible.

ISPRS WG VI/2, in conjunction with FIG WG 2.2, will organise and participate in special sessions on multimedia in education at Canberra, Australia. These sessions will be held in conjunction with the combined annual meetings of the Remote Sensing and Photogrammetry Association of Australasia, the Institution of Surveyors, Australia, the Mapping Sciences Institute of Australia and the Australian Urban and Regional Information Systems Association. The schedule for the conference is yet to be confirmed, but the meeting is likely to be held in September 2003. This will be the first time that the four organisations have held their national meetings as one conference, so there is an ideal opportunity to take advantage of interest in tertiary education across a broad range of disciplines within the spatial sciences.

WG VI/3: INTERNATIONAL CO-OPERATION AND TECHNOLOGY TRANSFER

Chair: Ulrike Rivett (South Africa)
Co-Chair: Tamara Bellone (Italy)

Accomplishments of the Working Group

Progress has been made with regard to the terms of reference: "Further development of international co-operation and public relations for ISPRS professions and stimulation of young professionals for co-operation in ISPRS activities". Various talks to young professionals in South Africa and Zimbabwe have led to an increased awareness of ISPRS.

Other activities include:
- Establishment of a new webpage.
- A seminar was held in Porto Allegre in collaboration with commission VI president Tania Maria Sausen and Working Group VI/1 chair Manos Baltsavias. The chair of Working Group VI/3 presented a paper and took part in one of the panel discussions.
- Organisation of a mid-term workshop in Dar es Saalam, Tanzania, in 2002 in collaboration with working group VI/1. Title: Developments and Technology Transfer in Geomatics for Environmental and Resource Management, Dar es Saalam Tanzania 25 –27 March 2002
- Contacts have been established with the local ISPRS members to promote ISPRS activities.

Working Group News and Future Plans

First steps towards the organisation of a workshop in Zagreb, Croatia, in 2003.
The chair, co-chair and secretary of the Working Group changed in July 2001. Due to the co-chair taking over the position of the chair, the transition was relatively smooth.

WG VI/4: INTERNET RESOURCES AND DISTANCE LEARNING

Chair: Sanjay Kumar (India)
Co-chair: Carlos G. Pattillo (Chile)

Accomplishments of the Working Group

To define and discuss on the agenda for the working group, a meeting was held on 10th February 2001 in New Delhi at Hotel Taj Palace. More than 50 academicians, researchers and professionals took part in the meeting from all over the world. There were delegates from ITC, The Netherlands, Delft University of Technology, The Netherlands, CEOS WGEdu, Indian Institute of Remote Sensing, Indian Space Research Organisation (ISRO), Anna University, Delhi University etc. In addition, few GIS industry professionals and other concerned has also attended the meeting. Dr. Tania Maria Sausen, Chairperson of ISPRS TC VI, chaired the meeting. She presented an overview of the objectives of the meeting, activities and the terms of references of the working group VI/4. Sanjay Kumar, Chairman, ISPRS WG VI/4, in his welcome address, has

emphasised on the need for developing a mechanism for distance learning in the field of Spatial Information Science (SIS) and the development of good quality training and education modules on it. The keynote address was delivered by Prof. Karl Harmsen, Former Rector, ITC, The Netherlands. In his address, he focused on the need of a global strategy for education and training in Remote Sensing and GIS.

The major papers presented during the meeting were essentially on the major topics viz.
- CEOS initiatives in education
- Perspectives on e-education in colleges and universities
- What's new in Internet and distance education
- Web-enabled education material etc.

During the concluding session, there were discussions on the proposed working plan of the WG VI/4. Working Group VI/4 proposed to launch a web-based Photogrammetry, Remote Sensing and GIS education programme. It also proposed to develop a web site for educators along with a web site on SIS education

WG VI/4 has launched a portal on SIS education (www.GISdevelopment.net/education) to promote Internet Resources and Distance Learning. The main attraction of the site is the exhaustive listing of educational institutes in the developing region of the world. This section offers a compilation of the over 100 educational institutes from 23 countries in Asia-Pacific region with details of the courses, research and academics of particular institutes with contact addresses. The site also contains details of the ongoing and forthcoming training programmes in various fields of SIS. Tutorials on this section have generated interests among professionals from varied disciplines, apart from the experts from GIS, RS and Photogrammetry. This site also contains very good information of books on Geospatial technology and its applications written by accomplished authors. Details of magazines and other publications are the other attractions of this section. Apart from the listing of books and magazines, the site also carries about 50 research papers and abstracts on GIS education. The career section provided in the portal caters the needs of the career aspirants in this field. The application and technology sections provided in the site contains more than 2000 research papers on geospatial technologies and their application to different fields. These papers are the data and information banks for the prospective students and researchers.

There is a compilation of the review of over 20 conferences on "SIS Education" organised all over the world. Apart from stressing the conferences on SIS Education, the site provides information about other conferences/ workshops and related events.

An education forum was organised by WG VI/4 during 7-9 February at Map India 2001, Asia's largest Conference and exhibition in this field. The forum provide a platform to universities and institutions, which are actively carrying out research and education in the field of Spatial Information Sciences, to share information about their courses and training programmes. In this forum, endeavour was made to discuss the possible mechanisms for promoting the distance learning on GIS through Internet. The forum tried to build an interface between industry and academia and facilitates the interaction for conceptualisation and realisation of collaborative programmes between GIS education sector and industry. IIRS (Indian Institute of Remote Sensing), Dehradun, JNT University, Hyderabad, CSSTE-AP (Centre for Space Science and Technology Education in Asia and Pacific), AIT (Asian Institute of Technology), Thailand were the major participants of this forum.

The forum realised that there is an urgent need to work on a strategy for reviving the SIS education policy, by making a look on to the issues like design of curriculum, infrastructure, distance learning, and accreditation at various stages of education from school to university.

The Working Group is also developing a Web-based Education Programme. Earth Observation education is highly demanded by planners, decision-makers and administrators who are directly involved in spatial analysis and planning. The philosophy of this education, like any other specialised education, rests in the provision and sharing of knowledge through the practical exposure to the system. However, the increased cost of the system restricts the number of training institutes in developing country like India to a countable figure. Most of the training institutions are confined only to metropolitan cities of the country. This results in the centralisation of training base, which makes it a costly affair for professionals from other parts of the country.

To bridge this gap in knowledge dissemination, WG VI/4 has worked out a proposal on developing a web-based education programme on Remote Sensing. The proposed programme essentially aims to rectify the spatial discrimination in knowledge dissemination. This involves an active and simplified art of teaching-by-teaching skills of problem solving, collaborative learning etc. The proposed course will be available free of cost to all aspirants. In the first phase of the programme, a Certificate course will be developed as a prototype on which rest of the courses will be designed. WG VI/4 endeavours to make this education available in regional languages in the near future. Since this project needs considerable investment due to the massive input of expertise, manpower and technology, WG VI/4 is looking forward for support from various agencies including ISPRS Commissions, CEOS WGEdu etc.

The concept of the prototype was demonstrated by Ravi Gupta, Secretary, WG VI/4 at the workshop organised by CEOS WGEdu at Frascati in September 2001.

CSDMS has also brought out a special issue on Geospatial education in its magazine, GIS@development, Volume 5 Issue 1, January 2001 (http://www. gisdevelopment.net/ magazine/gisdev/2001/jan/index.shtml). Here, it is pertinent to mention that GIS@ development is the Asia's first and only monthly magazine in the field of GIS, Remote Sensing and GPS with its readership all over the world.

Working Group News and Future Plans

The future activities include the content addition to its education portal and developing a portal for educators. In the educational institutes section, few more additions have to be made like information about syllabus, about the faculty, ongoing research projects in various institutions and other details. Also, it has been planned to add the interviews of the experts in the field of education. In continuation to its activities, WG VI/4 is planning to launch a portal for GIS and Remote Sensing teachers. The site will provide complete teaching materials to be used in classroom. It will also include the details of various ongoing research projects in various universities and institutions. It is expected that the web-site will be able to provide a common platform-enabling interaction among teachers. This portal is expected to be beneficial for the GIS community, academia, NGOs and other research organisations working on education.

TECHNICAL COMMISSION VII
RESOURCE AND ENVIRONMENTAL MONITORING

President: Rangnath Navalgund (India)
Secretary: Shailesh Nayak (India)

State of Science and Technology of Commission Topics

Availability of very high-resolution imagery (IKONOS, QUICKBIRD and EROS-A1) has dramatically changed the scenario in remote sensing applications, especially its use in infrastructure development and urban management. High-resolution imagery are capturing greater share of markets. However, the high cost of IKONOS data is a limiting factor in its widespread use. Rigorous models are required to correct for distortions due to platform movement and the sensor. Thematic maps up to 1:1000 scale have been prepared for their use by local municipalities. Planimetric accuracy of 2-3 m and DEM accuracy of 3-5 m depending upon land cover have been achieved. Future work should lead to integrating available cartographic data as well as extracting information on cartographic features from DEM. In coming years, many more such satellites are proposed to be launched and hopefully data cost will be more affordable.

Space-based observations are increasingly being used in all aspects of disaster management, especially for floods, cyclones, droughts, etc. However an operational system, which can integrate variety of remote sensing as well as in situ data and provides information with quick turn around time is yet be functional. Work towards definition of a constellation of satellites carrying both optical and microwave sensors is gaining importance. The detection and monitoring of surface deformation for understanding geological hazards through SAR interferometry is an important field of research.

Global change is much more than climate change. Human activities significantly affect the functioning of the Earth system. The driving forces of global change such as deforestation, agricultural practices, land-use changes, urbanisation, etc. need to be monitored continuously to understand their impact. Observations from space through various remote sensors have provided new data on the understanding of earth. Launch of Terra -1 Mission has added to this capability.

Population of the world is increasing at an alarming rate. It is likely to double by 2100. Food security demands sustainability in agriculture. Precision farming is a method of ensuring sustainable agriculture. Integrated use of remote sensing data, GPS and GIS and other input on agricultural practices could possibly help this process. Availability of multispectral data at high spatial resolution is facilitating some of these experiments. Hyperion onboard EO-1 adds observation capability in the spectral domain.

Natural resources are vital for national development. Periodic monitoring of resources through satellites has become a practice in many countries. Information on status of forest, coastal habitat, wetlands, glaciers, etc. has been generated routinely. The major requirement is to develop and validate models to integrate remote-sensing-based-information with in situ data, which will aid decision making. Data from ASTER (VNIR, 15 m, SWIR, 30 m, TIR, 90 m), IRS 1C/1D, Landsat and SPOT are quite useful for such studies. The future satellites will further enhance this capability. Shuttle Radar Terrain Mapping mission has provided vital digital elevation information for the entire globe.

Accomplishments of the Commission

Preparations for holding the mid-term symposium at Hyderabad, India has been an important activity. This Symposium is being organised in collaboration with the Indian Society of Remote Sensing and is hosted by the National Remote Sensing Agency, Hyderabad. It will be held during December 3-6, 2002. Three thousand five hundred copies of the first circular have already been mailed. Intercommission sessions with TC I, IV and VI have also been planned. Two pre-symposium tutorials on Sustainable

Agriculture and Integrated Coastal Zone Management are planned on December 2, 2002. The details are available on web-site www.commission7. isprs.org.

Special technical sessions on Disaster Management and Spatial data infrastructure for disaster management (with WG IV/4) were organised during December 12 and 13, 2001 at the National Symposium on Advances in Remote Sensing Technology with special emphasis on High Resolution Imagery, at Ahmedabad, India. Distinguished scientists delivered lectures. Apart from this, oral as well as interactive presentations were also organised.

The President of TC VII made the following invited technical presentations on:
- Applications of Remote Sensing and GIS in Sustainable Development and Disaster Mitigation: Indian Perspective at the UK Remote Sensing and Photogrammetry Conference, during September 12-14, 2001,
- Applications of remote sensing and GIS in documentation, exploration and management of natural heritage sites and cultural landscapes: Indian experience at the Space and Time Conference, Sopron, Hungary, September 6-8, 2001,
- Scenario and Perspectives of Space in Ocean and Coastal Applications at the PORSEC Conference on December 5, 2000, Goa, India.

The Secretary of TC VII delivered the following invited talks:
- IRS P4 Ocean Colour Monitor and its applications at the Symposium on Ocean Colour Remote Sensing and the Asian Marine Environment on December 11, 2000 at AIT, Bangkok, Thailand, organised by NASDA, ESCAP and IOCCG.
- Integrated Coastal Zone Management- role of RS and GIS at the Training Course on RS and GIS for Coastal Applications and conducted tutorials on Ocean Colour held at Bogor, Indonesia, organised by SEOMEO BIOTROP during Oct 23-Nov 1, 2001. Tutorials on Ocean Colour were conducted during December 12-15.

A two-week training course on Ocean Colour: Techniques and Applications for the participants from the South-east Asian countries was organised in collaboration with the International Ocean Colour Co-ordinating Group (affiliated to SCOR/IOC) during February 12-23, 2001, Ahmedabad, India.

A Pre-conference training module on Ocean Colour was organised during PORSEC 2000, during Nov. 30-Dec. 2, 2000 at Goa, India.

President TC – VII facilitated setting up RS Data Processing Centre at Yangon, Myanmar.

Working Group Activities during the Current Year

WG VII/1: FUNDAMENTAL PHYSICS AND MODELLING

Chair: Karl Staenz (Canada)
Co-Chair: Marc Leroy (France)

State of Science and Technology of Working Group Topics

Many of the WG topics have been addressed in recent workshops and conferences. Progress in the various areas, such as sensor development, calibration, data pre-processing (e.g. atmospheric correction, BRDF), modelling, advanced information extraction techniques, and applications development, have been demonstrated in the ISPRS supported events, the 8th International Symposium on Physical Measurements and Signatures in Remote Sensing (Aussois, France; January 2001) and the International Symposium on Spectral Sensing Research (ISSSR'01) (Quebec, Canada; June 2001). In addition, symposia such as NASA's 10th JPL Annual Airborne Earth Science Workshop (Pasadena, U.S.A.; February 2001), the International SPIE Conference on Imaging Spectrometry VII (San Diego, U.S.A.; July 2001), and IGARSS'01 (Sidney, Australia; July 2001) revealed the advances made in the development of imaging spectrometry (hyper-spectral remote sensing) and microwave remote sensing.

Accomplishments of the Working Group

The major activities of WG VII/1 were the participation in the organisation and execution of the 8th International Symposium on Physical Measurements and Signatures in Remote Sensing and the International Symposium on Spectral Sensing Research (ISSSR'01).

The 8th International Symposium on Physical Measurements and Signatures in Remote Sensing was divided in 10 sessions with 37 oral and 85 poster papers. These sessions covered topics such as land cover classification and scaling issues, data correction and pre-processing, signatures in optical and microwave remote sensing, geo/biophysical parameter retrieval, and data assimilation in models. Two special sessions focused on earth observation (EO) data requirements and future space missions. About 200 scientists have participated. Proceedings of the Symposium are available.

One major conclusion of the symposium was that the physics of measurement and spectral signatures would remain an active area of research for some time to come despite the evolution of this field over the last years. The trend in EO data requirements is related to an improvement of existing temporal, spatial, and spectral resolution. A consideration of two or all three requirements is a challenge for future space-borne systems. A need for dedicated sensors for the observation of variables related to specific applications has emerged as a recommendation from the symposium. Especially the terrestrial component of the carbon cycle was mentioned as an application area.

The International Symposium on Spectral Sensing Research (ISSSR'01), the sixth in the ISSSR series, focused on the theme "Sensing from Space", emphasising the generation of information from remotely sensed data. The symposium contained 13 sessions with 68 papers. The sessions addressed a variety of topics, such as sensor systems, modelling and simulations, tools and methodology, data analysis, and environmental applications. There was a mix of military and civilian applications, including minefield detection (including the detection of disturbed soils), military target detection, chemical and biological agent, and disaster mapping and monitoring.

The symposium showed the progress of hyper-spectral remote sensing and its huge potential for civilian and military applications. The trend in sensor system development focuses more and more on sophisticated systems with very fine spectral resolution (e.g., Fourier Transform Spectrometer). A need for real-time data processing is becoming an issue since the data analysis is becoming more complex due to the high volume of data and the fast turn-around time required for product generation. This is particular important for military and disaster management applications.

The WG VII/1 actively participated in the 18th CEOS Cal/Val WG Meeting (Frascati, Italy; June 2001). The focus was on Radarsat and Landsat calibration and on land surface parameter validation.

Working Group News and Future Plans

The main event in 2002 for the WG VII/1 will be the involvement in the mid-term symposium of TC VII to be held in December of 2002 in Hyderabad, India. Future symposia supported by WG VII/1 are the International Symposium on Spectral Sensing Research (ISSSR) to be held in the U.S.A. in 2003 and the 9th International Symposium on Physical Measurements and Signatures in Remote Sensing to be held in France early 2004. The collaborative effort with CEOS Cal/Val WG will continue in the context of the next meeting which will be held in May 1 to 3, 2002 in Ottawa, Canada.

WG VII/2: SUSTAINABLE AGRICULTURE AND ECO-SYSTEM APPROACH

Chair: Andrew K.Skidmore (The Netherlands)
Co-Chair: Lief F.Tian (USA)

State of Science and Technology of Working Group Topics

An integrated system for providing multiple forecasts during a crop season using both optical and microwave data along with agro meteorological inputs is being established in India. Resourcesat carrying a set of three sensors AWiFS, LISS-3 and LISS-4 (5.8 multispectral) to facilitate this effort is planned for launch end 2002. Use of models to understand sustainability of cropping systems using RS inputs on crop-crop rotation is being demonstrated. High resolution data is helping to test precision farming concept.

Accomplishments of the Working Group

- Initiate new working group
- Develop mailing list
- Plan program for 2002-2004

Working Group News and Future Plans

- Tutorials on "sustainable agriculture" on December 2, 2002 at Hyderabad, India prior to the mid term symposium
- Technical sessions at the December, 2002 symposium
- International symposium/workshop in the first quarter of 2003 addressing environmental indicators (as applied to agricultural systems, natural resource management, and multi scale approach from precision farming to global impacts) will be organised during 2003 at ITC, the Netherlands. Special ISPRS journal issue on environmental indicators in 2003, organising theme sessions in Istanbul Congress, and commission state of art reviews of working group topics are some of the activities planned.

WG VII/3: INTEGRATED MONITORING SYSTEMS FOR RESOURCE MANAGEMENT

Chair: Sandra Maria Fonseca da Costa (Brasil)
Co-Chair: Li Yingcheng (China)

State of Science and Technology of Working Group Topics

Availability of RS data at various spatial resolutions ranging from global to regional to local scale, advances in data processing, data fusion and GIS techniques, decision support systems, are facilitating evolving integrated monitoring systems in many fields such as coastal zone management, watershed development, forest eco systems, etc., Information systems comprising RS-derived thematic layers, attribute information on demographic, socio-economic aspects along with `what if' solutions are being developed at national/regional/local levels.

Working Group News and Future Plans

A Tutorial on Integrated Coastal Zone Management will be held on December 2, 2002, prior to mid-term Symposium

WG VII/4: HUMAN SETTLEMENT AND IMPACT ANALYSIS

Chair: Gábor Remetey-Fülöpp (Hungary)
Co-Chair: Carsten Juergens (Germany)

State of Science and Technology of Working Group Topics

Five years after the Istanbul Declaration and the Habitat Agenda it was time to review how far the commitments are being implemented and to make recommendations for future actions. One of the approved aim of the ISPRS Working Group VII/4 is to investigate the widespread use of GIS/remote sensing in the national reports prepared for the Special Session of the UN General Assembly held in New York, June 2001 (Istambul+5) and providing a

review report for the mid-term ISPRS Commission VII symposium to be held in Hyderabad. The work has been started by the study of UNCHS publications such as the Guidelines for Country Reporting and the Country Report on Hungary. The following three of six Agenda themes need the advanced technologies of GI/GIS and aerospace remote sensing:

- Environmental management (providing regional and sub-regional level responses to disaster mitigation and management, monitoring urban environment and change detection; urban sustainability),
- Urban governance (for sustainable human settlements development taking into account the estimation, by 2030 more than 60% of the world's population will live in towns and cities. Good urban governance is characterised by seven interdependent and mutually reinforcing norms, which are introduced), and
- International co-operation (strengthen the use of open GIS systems for urban data management, elaboration of spatial data infrastructure based on international initiatives, emphasise the role and importance of interoperability and use of ISO standards and /OGC recommendations to facilitate the co-ordinated implementation of the Habitat Agenda)

Encouraged by the President of ISPRS and the local organisers of the Organisation of Islamic Capitols and Cities, representative of the WGVII/4 was invited to Cairo in February 2001 to the Conference devoted to GIS/RS and the urbanisation.

Use of remote sensing in urban applications was in the focus of the successful Regensburg Conference organised partly under the ISPRS logo by the WG Co-Chair Dr. Carsten Jürgens in June 2001. By the launch of the newest sub-meter resolution remote sensing satellite system in Autumn 2001 it is anticipated that the competition of the commercial very high resolution systems will allow more economical use of these data for urban analysis and planning.

Accomplishments of the Working Group

WG Co-chair Carsten Jürgens participated in the 9th Conference of the Organisation of Islamic Capitals and Cities (OICC) and the 7th International Seminar "Geographic Information Systems Applications in Planning and Sustainable Development" held in Cairo/Egypt from February 13-15, 2001 (ISPRS highlights Vol.6 No.2). The major concerns of the delegates and seminar speakers included: i) Rapid urban growth and associated management problems, ii) How can sustainable development in mostly arid environments be achieved for metropolitan areas, and iii) How can the GIS-toolbox be efficiently be used. About 350 participants from all Islamic countries were present to discuss these topics and to exchange ideas and experiences in data processing strategies.

2nd International Symposium on Remote Sensing of Urban Areas (Regensburg, June 22-23, 2001) was organised in continuation to the first symposium Remote Sensing of Urban Areas (Regensburg 1997). Conference topics included monitoring of urban growth (time series, trend analysis, change detection, land-use transformation), thermal data analysis, road extraction techniques, IKONOS applications, monitoring urban land cover dynamics, high-resolution airborne digital sensors for urban applications, ecological aspects of urban landscapes as well as towards a global urban monitoring facility. The Symposium attracted experts from 20 countries. An edited book entitled "Remote Sensing of Urban Areas", 35th Book in a series of the "Regensburger Geographische Schriften" was brought out by ISPRS WG VII/4 Co-chair Carsten Jürgens. Next venues will include Istanbul (2002) and Regensburg (2003).

The Conference on Space and Time co-organised by ISPRS WG VII/4 in Sopron, between 4-6 September was actively participated (with presentations) by ISPRS TC President Rangnath Navalgund, Peter Waldhaeusl, President of CIPA, and the officers of WG VII/4 C. Jürgens, P. Winkler and G. Remetey-Fülöpp. UNESCO Director of the World Heritage Sites Office Mr. Bandarin attended the conference and emphasised the potentials of co-operation with ISPRS. The main objective of the conference was to bring together scientists and interested parties to discuss aspects of monitoring and change detection of world heritage sites and to draft guidelines for a unified GIS database, in order to help new site nominations and improve disaster-monitoring capacity for site managers and national authorities. About 80 experts from 20 countries from Canada to India and South Africa to Germany participated. Lectures were delivered among others by F. Bandarin, Director of UNESCO's World heritage office in Paris, R. Navalgund, President of ISPRS Commission VII, C. Juergens, P. Winkler and CIPA President Prof. P. Waldhaeusl. Chair G. Remetey-Fülöpp gave an in-depth overview on the strategy and early results of the ISPRS WG VII/4.

The First Periodic Reporting Cycle (2000-2005) of the Convention concerning the Protection of the World Cultural and Natural Heritage adopted by the GC of UNESCO in 1972 is a strategic challenge not only for the whole RS & GIS, but also for the cultural resource management (CRM) community. From 630 sites already inscribed on the World Heritage List, 487 will be scrutinised on a regional basis during this ongoing six years Cycle.

Ambassador J.Jelen, internationally acknowledged expert in this field said that "Remote sensing & GIS together with CRM should provide desperately needed tools for governments, municipalities, local communities, investors and developers involved in this work. Synergy of all the three components is the key to sustainable resource management of the most precious cultural and natural sites of the world. Research communities and universities should work in close co-operation with the key stakeholders for the benefit of all" he added. Hungary has been playing a leading role among nations working on the subject. Excellent pilot projects for Zoning and Environmental Protection of his-

toric sites (e.g. on Angkor, then on Budapest, Visegrád, Hortobágy and Fert) have been prepared. Setting a standard for the next periodic report cycle.

The International GIS Day 2001 was an event hosted by the Ministry of Agriculture and Regional Development in Budapest on November 14, 2001. The event attracted 220 participants featured by the written messages of three international nobilities of the IT/GIS/RS profession: Erkki Liikanen, Member of the European Commission (High Commissioner of the DG Information Society and Enterprises), Santiago Borrero-Mutis, Chair of the Steering Committee of the Global Spatial Data Infrastructure, Director of the Augustin Codazzi Geographical Institute in Bogota as well as Francois Salgé, Secretary General of AFIGÉO and CNIG, the French inter-ministerial forum on GI. The programmes included 20 presentations on the use of advanced technologies in monitoring agriculture, environment, natural disasters and sustainable regional development (www.gisinfo.hu)
WG Secretary Peter Winkler promoted the ISPRS WG VII/4 co-sponsored conference held in Sopron at the EARSeL Bureau Meeting in Paris, January 10, 2001. WG Chair Gabor Remetey-Fülöpp promoted the same WG event at the European Umbrella Organisation for Geographical Information (EUROGI) Executive Committee Meeting in Apeldoorn, January 19-20, 2001. The EARSeL Symposium held in Marne la Vallée, June 2001 was actively participated by WG Secretary Peter Winkler at the invitation of ISPRS Council officer Gerard Begni.

Chair G. Remetey has built contact with IHDP Secretariat exchanging documents and information with special emphasis on impact study of human dimension of urbanisation, on ecological and social environment. WG Chair took part at the 6th GIS Day in Cluj devoted to the subject urban management and GIS/RS. WG Chair G.Remetey took part in the meeting of the Working Group "Land use and land cover statistics held in Luxembourg, organised by EUROSTAT between November 5-6. By invitation of the WG Chair, Istvan Balsay, chair of the Parliamentary Committee for Regional Development delivered a presentation at the GIS Day Hungary on November 14. WG Co-chair Carsten Jürgens was active as Scientific Programme Committee member of the IEEE/ISPRS/EARSeL Joint Workshop held in Rome between November 8-9 on "Remote Sensing and Data Fusion Over Urban Areas" (http://tlc.unipv.it/urban_2001, http://tlc.unipv.it/intlink.htm.

A country report submitted to the UN Special Session Habitat+5, New York, June 2001 was received for assessment of how to apply technologies such as RS and GIS in measuring, e.g. key indices by objective and quantitative way. The WG chair met with Sylvie Lacroux, Senior Human Settlements Officer, Head of the UN Centre for Human Settlements (Habitat), Head of Geneva Office at the General Meeting of the UN ECE Working Party of Land Administration held in Geneva between 19-20 November 2001. Based on the introductory talks, the information on the activity of ISPRS WG VII/4 will be submitted to the Nairobi Office to exploit further possibilities of co-operation.

Working Group News and Future Plans
- 3rd Symposium on Remote Sensing in Urban Applications, Istanbul, June 11-13, 2002.
- International Workshop in September 2003.

WG VII/5: DISASTER MONITORING, MITIGATION AND DAMAGE ASSESSMENT

Chair: Vern H. Singhroy (Canada)
Co-Chair: Michael Abrams (USA)

State of Science and Technology of Working Group Topics
The uses of EO data for disaster monitoring, mitigation and damage assessment are increasing. Current high -resolution satellites both Optical and SAR with stereo and InSAR capabilities are being used in all the phases of disaster management- before, during and after the disaster. However, there are serious gaps in the operational uses of EO for disaster management. The most serious issues are the timeliness of the data in the response phase, and reliable predictive models. SAR interferometry needs to be tested in various environments. ISPRS VII/5 working group will continue to discuss, new EO techniques and case studies to educate and advise users and space agencies, develop operational guidelines, to assist us to live with disasters.

Accomplishments of the Working Group
The working group (VII/5) met in Brussels together with CEOS Disaster Management Support Group. The group produced a Landslide Hazard Team report for CEOS. This report can be viewed at (http://disaster.ceos.org/landslide.htm). Dr. Singhroy is also the chair of the Landslide Hazard team of CEOS. Singhroy also represented ISPRS-VII/5 at the UNESCO/IGOS-P geohazard theme meeting in Paris in May 01. In Jan 02, Singhroy will represent ISPRS to finalise the IGOS-P Geohazard theme proposal.

ISPRS-VII/5 is a Co- Sponsor of a Special session on Geological Processes and Geohazards: at the IGARSS 02 meeting in Toronto in July 2002 and will convene a special Session on Space Applications of Disaster Monitoring, Mitigation and Damage Assessment at its mid- term ISPRS Commission VII meeting in India in December 2002. The Working Group co-operated with the European Geophysical Society on special sessions on Earth Observations and Disaster Management, Nice, May 2001.

Working Group News and Future Plans
- Organising technical sessions at the TC-VII Symposium, Dec. 3-6, 2001.
- Special Journal Issue on EO Techniques for Disaster Management, 2002.

WG VII/6: MONITORING AND MODELLING OF GLOBAL ENVIRONMENTAL CHANGE

Chair: Yoshifumi Yasuoka (Japan)
Co-Chair: Vinaykumar Dadhwal (India)

State of Science and Technology on Working Group Topics

The IPCC has completed its Third Assessment Report in 2001, and it provides new scientific, technical and socio-economic backgrounds on global climate change. The UN Framework Convention on Climate Change (UNFCCC) made a substantial progress in the COP-7 at Marrakesh, Morocco, 2001. The Terrestrial Carbon Observation (TCO) program under CEOS, IGBP, IHDP and GTOS was extended to the Global Carbon Observation (GCO) program to integrate carbon observation over ocean and atmosphere as well as land. These activities would promote and enhance the monitoring and modelling activities on global environmental changes.

Accomplishments of the Working Group

WG VII/6 has established the IGBP/IHDP LUCC Focus 2 (Empirical Observation and Diagnostic Modelling) secretariat office to promote joint programs between ISPRS and IGBP. The secretariat is at the Institute of Industrial Science (IIS) of the University of Tokyo (UT).

Secretariat of IGBP/IHDP LUCC Focus 2:
Director: Prof. Ryosuke Shibazaki, IIS/UT
Scientific Officer: Dr. Krishnan S. Rajan, IIS/UT
IGBP/IHDP LUCC Workshop was held at the Science Council of Japan (Tokyo) from December 13 to 14, 2001.

Development of a global/continental scale environmental database is another important activity. The reception of TERRA/MODIS data at the IIS/UT campus, Tokyo and at the Asian Institute of Technology (AIT), Bangkok since April, 2001 has started. An Asian data set is being archived at the IIS/UT and data distribution through science communities including ISPRS and IGBP will be started. Working Group VII/ 6 will utilise the above mentioned data set to develop several thematic maps for environmental and disaster monitoring. The WG will also investigate methodologies, in particular, for the following new research fields: Scaling from local to global assimilation of remote sensing data to ecosystem models.

Working Group News and Future Plans

WG VII/6 workshop on Monitoring and Modelling of Global Environmental Change is planned for June 2003. It will take place at the Tokyo Big Sight (Tokyo, Japan) and will be jointly organised by ISPRS WG VII/6, ISPRS Commission IV, Japan Society of Photogrammetry and Remote Sensing, Japan Association of Surveyors, and other International Research Programs including IGBP/IHDP LUCC (Lund Use/Cover Change), GTOS/GOFC (Global Terrestrial Observing System/ Global Observation of Forest Cover). The workshop will be held together with "Geo-informatics Forum 2003" organised by Japan Association of Surveyors.

Other Relevant Information

The proposed themes for Istanbul Congress 2004 are given below.

- Hyperspectral remote sensing (WG VII/1)
- Towards operationalisation in remote sensing (WG VII/1)
- Advanced classifiers and data fusion techniques (WG VII/1)
- Sustainable agriculture and precision farming (WG VII/2)
- Integrated approach for crop production forecasting (WG VII/2)
- Integrated coastal zone management (WG VII/3)
- Applications of RS and GIS in geoscience and terrain evaluation (WG VII/3)
- Integrated monitoring systems for water resources management (WG VII/3)
- Applications of high spatial resolution data in urban sprawl, perspective and development planning (WG VII/4)
- RS and GIS in archaeological studies (WG VII/4)
- Space inputs in disaster monitoring, mitigation and damage assessment (WG VII/5)
- Use of global and regional databases for studying global change (WG VII/6)
- Assimilating RS data in global change models (WG VII/6).

The XXth ISPRS Congress

The activities for the year of 2001 consists of the following items carried out by the ISPRS 2004 Congress Directorate.

Planning and Arrangement of the Congress Venues

Several site inspection visits were paid to the International Istanbul Convention & Exhibition Center (ICEC - www.icec.org), where the ISPRS 2004 Congress is planned to be held, and also to other complementary premises in the close vicinity, within the so-called "Conference Valley". Discussions were held with the respective managing bodies, in order to get the most convenient Congress set-up with the best possible conditions. We expect to finalise this work and undersign contracts in 2002.

Program
Special time and effort were devoted to create and to co-ordinate the overall Congress program, so that it comes out satisfactorily for all participants from the viewpoint of framework, timing and content.

Congress Leaflet
45,000 copies of a colourful leaflet containing preliminary information, program and a pre-registration form has been printed. 35,000 copies were distributed worldwide. 10,000 copies are still in stock.

Stands
To promote both ISPRS and the Congress during the related national and international meetings, two elegant self-standing Chronoexpo 1 banner displays were purchased and the graphic panels were meticulously designed for ISPRS use.

Guideline Update
Guidelines for Preparation and Presentation of Technical Papers at ISPRS Congresses and Symposia has been updated and published in the Orange Book:
- B.2 Guidelines for Authors Preparing Manuscripts for ISPRS Sponsored Meetings
- B.3 Manual for Presentation of Technical Papers at ISPRS Congresses and Symposia

With the new updates, presenters are encouraged to use digital presentations, whereas conventional systems are meant mostly for backups.
The Guidelines for Preparation of Member Reports were also revised and updated.

Scientific Program of the Congress
As far as the scientific program of the Congress is concerned, a series of new regulations were adopted by the end of October 2001 and a Concept Letter for the preparation of the Technical Program of the ISPRS Congress in Istanbul-2004 was agreed by TCPs and posted on the web.

International Meetings
To promote the ISPRS 2004 Istanbul Congress, Prof. Dr. M. Orhan Altan participated in many international meetings in 2001.

By Orhan Altan, ISPRS Congress Director

Regional Member Activities

European Association of Remote Sensing Laboratories (EARSeL)

General Information
The Bureau and Council of EARSeL met twice in the year 2001, once in January in Paris and the second time on the occasion of the Annual General Assembly, held at the Ecole Nationale des Sciences Géographiques at Marne-la-Vallée, near Paris, France, in May. At the regular January meeting each of the national representatives, who form the EARSeL Council, presents a report on remote sensing activities and projects within their country. Then the present and future activities of the Special Interest Groups are discussed, as well as co-operation with other societies and future strategy orientations. At these January meetings, representatives of other international organisations, whose activities include remote sensing research and applications, are also invited to make a report. The ISPRS has produced a matrix of its own Commissions and Working Groups and those of its Regional Members, which shows where research areas overlap and which should facilitate co-operation among the different groups.

During the Council meeting held in May, a new Bureau was elected to hold office for two years, renewable for a further term of two years. The Bureau is now composed as follows:

Chairman	Prof. Dr. Eberhard Parlow, University of Basel, Switzerland
Vice-Chairman	Prof. Paul Mather, University of Nottingham, U.K.
Secretary General	Prof. Dr. Rudi Goossens, University of Gent, Belgium
Treasurer	Dr. Rainer Reuter, University of Oldenburg, Germany

Dr. Tomas Benes of the UHUL Forest Management Institute continues to be the EARSeL contact for East/West relations.

The EARSeL community, represented by its Chairman, is invited to participate in the discussions of the ESA Earth Science Advisory Committee, which has made important recommendations and decisions concerning the "Living Planet" programme.

Regional Member Activities during the Reporting Period
The highlight of the year for EARSeL members is the annual General Assembly, with its accompanying symposium and workshop(s). Apart from these events, EARSeL also organises specialist meetings and workshops through its Special Interest Groups.

The Annual General Assembly and the 21st EARSeL

Symposium on the theme "Observing our Environment from Space – New Solutions for a New Millennium" was held at the Ecole Nationale des Sciences Géographiques from 14-16 May. This brought together participants from 27 countries, some of whom came from India, several African countries, the USA and Canada.

This was followed by the 3rd specialist workshop organised by the Forest Fires Special Interest Group on the theme "Remote Sensing and GIS Applications to Forest Fire Management – New Methods and Sensors." The workshop was attended by 70 researchers from 15 countries (Spain, Portugal, Greece, Italy, France, Germany, Finland, Canada, USA, Senegal, United Kingdom, Russia, Ukraine, Switzerland and Czech Republic). Contributions were organised around three topics, each introduced by an invited in-depth overview paper: Fire Prevention, Fire detection, and burned land mapping. All contributed papers were presented in 3 poster sessions of one hour, followed by general group discussion of one hour. Additionally, a round-table session was held focused on the challenges in the application of remote sensing to operational forest fire management. This formula for the workshop, which allowed plenty of time for discussions, was very much appreciated. Another workshop is planned by this group to follow the Symposium 2003 to be held in Gent, Belgium.

Another technical workshop on Remote Sensing by Low Frequency Radar, a theme at the forefront of research, was organised in Naples (Italy) on 20/21 September in collaboration with CO.RI.S.T.A. (Consortium of Research on Advanced Remote Sensing Systems). The topic dealt with the increasing expectations of the scientific community for the interesting characteristics of this type of sensors - which operate down to HF frequencies - due to the high penetration. In recent years, the range of applications of Low-frequency Radar (LFR) systems, has rapidly increased and extends to archaeology, ecology, environment, geology and geophysics, glaciology, oceanography, as well as planetology. The workshop was attended by some 50 specialists from the five continents, who appreciated both the high level of the papers presented and the magnificent surroundings of the Bay of Naples.

Reports on all these events can be found in the quarterly EARSeL Newsletter. The Proceedings of the annual symposium are published in hardback by Swets/Balkema, The Netherlands. EARSeL has now launched its series of eProceedings on CD-ROM to publish those of its specialist workshops and the CDs of the Workshops held to date are now available through the Secretariat.

Participation in Events Organised by Other Associations

EARSeL has sponsored and participated in several meetings organised this year by ISPRS Commissions III and VII Working Groups, including the meeting on "GIS and Remote Sensing with special emphasis on Monitoring World Heritage Sites" organised by WG VII/4 on 6-8 September in Sopron, Hungary, and the 1st IEEE/ISPRS Joint Workshop on "Remote Sensing and Data Fusion over Urban Areas", organised by WG III/6 in Rome, Italy, on 8/9 November.

EARSeL was also present at the annual UK remote sensing event in September, organised by the Remote Sensing Society, which has now merged with the Photogrammetry Society, to become the Remote Sensing and Photogrammetry Society.

Plans for Forthcoming Activities

23-25 January 2002 - 4th international conference on "Fusion of Earth Data", Sophia Antipolis, Côte d'Azur, France

11-13 March 2002 – 3rd international workshop on "Observing our Cryosphere from Space: Techniques and Methods for monitoring Snow and Ice with regard to Climate Change", Berne, Switzerland.

4-6 June 2002 - Annual General Assembly and 22nd Symposium: "Geo-Information for European-wide Integration", to be followed on 7th June by a specialist workshop on the "Role of Remote Sensing for Environmental Modelling" - Prague, Czech Republic.

18-20 September 2002 - 2nd SIG Workshop on "Remote Sensing for Developing Countries" with a special session on SRTM data - Bonn, Germany.

3-6 June 2003 - Annual General Assembly and Symposium - Gent, Belgium - to be followed by specialist workshops organised by the SIGs on Forest Fires and Lidar/Coastal Zone Management.

Major Accomplishments of Regional Member during Reporting Period

Apart from organising the above meetings and arranging for the publication of the relevant Proceedings and Journals, EARSeL acts as a focal source of information on remote sensing activities throughout the extended European region.

EARSeL has established a new Special Interest Group on Self-Organised Criticality in the Environment, led by Prof. Leonid Vasiliev of the Institute of Geography of the Russian Academy of Sciences.

It is also planned to launch in 2002 a Special Interest Group on "Multilateral Environmental Agreements" in collaboration with ISPRS and led by Dr. Gérard Bégni.

The EARSeL Directory of members, the Newsletters, calendar of activities, Abstracts of papers to be presented at meetings organised by EARSeL, are now available on the EARSeL Website: http:www.earsel.org.

General Comments Concerning Relations with ISPRS

There is a general consensus that there are too many meetings that researchers would like to attend and therefore EARSeL welcomes all opportunities to collaborate in the organisation of meetings with the various Commissions and Working Groups of ISPRS that deal with the theory and applications of remote sensing techniques. Following the study undertaken by ISPRS to identify areas of activities where those of regional members overlap with those of certain ISPRS WGs, we expect these opportunities to multiply. We are also seeking to collaborate with other Regional Members of ISPRS through our SIG on Remote Sensing for Developing Countries.

By Rudi Goossens, EARSeL Secretary General

OEEPE

The only constant in the world of today is change. This also applies to the OEEPE.

Strategic OEEPE changes that started a few years ago were concretised in 2001 by launching a new Research Plan 2001-2003; to better match with the new research targets, OEEPE Commissions have been renamed and their respective mission, terms of reference, action plan and needed research alliances renewed.

Other important OEEPE achievements in 2001 have been:
- Portugal has become a member of the OEEPE in the fall of 2001, bringing the number of European countries that are members of the OEEPE to eighteen
- The OEEPE EUREKA Umbrella Project "Environmental AGIS" has been approved by the EUREKA Council of Ministers in June 2001
- Four successful Workshops have been organised (Airborne Laser Scanning and Interferometric SAR for Detailed DEM; Integrated sensor orientation; From 2D to 3D, establishment and maintenance of national core geospatial databases; XML/GML)
- A new type of activity has been started, namely the development of OEEPE educational services, to provide distance education on results of OEEPE research
- Two new Official Publications on Automatic Generalisation (#39) and on Airborne Laser Scanning and Interferometric SAR for Detailed Digital Elevation Models (#40 on CD-ROM) have been disseminated
- Co-operation with other GI pan-European and International Organisations has been enhanced to improve research synergy

2002 will also be a pro-active year for the OEEPE:
- The OEEPE will be renamed to better visualise its new mission, vision and strategic research perspective
- Possibilities for the OEEPE to become a Network of Excellence under the 6th European Framework will be further explored
- Several new research projects will be launched: Use of image deformation parameters; Road extraction performance; Evaluation of building extraction; Test of digital cameras.
- Several Workshops will be organised: Spatial Data Quality Management (21-22 March 2002 in Istanbul, Turkey); Next generation of national spatial databases (22-24 May 2002 in Southampton, UK); Visualisation (date and venue to be confirmed)
- Several Official Publications are expected: A structural approach to the management and optimisation of geoinformatics processes; Integrated sensor orientation; Topographic mapping from high resolution space sensors; Proceedings of Workshop on 2D to 3D, establishment and maintenance of national core geospatial databases and XML/GML Workshop
- OEEPE Presidency will be transferred from Prof. Ø. Andersen (Norway) to Prof.Dr. R. Kuittinen (Finland) at the 100th meeting of the OEEPE Steering Committee early June in Rauma, Finland

Thus the "old" OEEPE (it will exist for 50 years by fall 2003) is still a very dynamic "young" organisation, looking into the future without forgetting its past.

By Chris Paresi, OEEPE Secretary General

Intersociety Activities

ICSU (International Council of Sciences)

ISPRS is currently an associate of ICSU. However, in recognition of the increasing importance of remote sensing in the fields of environmental monitoring and assessment, ISPRS decided in 1997 to apply for full membership. Due to some delays in processing the application, it was not considered at the ICSU plenary meeting in 1999. However the application has now progressed and ICSU is seeking letters of support for ISPRS application. Council is

hoping that international unions and national members of ICSU will respond positively to the application and is attempting to take appropriate actions so that this will occur.

It is recognised that an important application of remote sensing is for monitoring sustainable development. In 2001 several scientists associated with ISPRS applied for funding through the ICSU annual grant program, to study the application of remote sensing for sustainable development in tropical regions. While the application was unsuccessful, (there was a success rate of less than 25% for all grants) it received favourable comments. ISPRS will aim to apply again in the future, based on an improvement in the participation of other international unions in the project and a more focused research plan.

ICSU has prepared a document for the preparatory process for the world summit for Sustainable Development, which addresses the issues in Chapter 31 of AGENDA 21, entitled Role and Contributions of the Scientific and Technological Community (S&TC) to Sustainable Development for the World Summit for Sustainable Development (WSSD), (also referred to as RIO+10) to be held in South Africa in September 2002. ISPRS, as an associate of ICSU was asked to make a contribution to this document. The document is limited to 16 pages, but it includes a positive statement about the importance of remote sensing for sustainable development, as quoted in the following paragraph. This is an important advance on the low level of recognition often given by decision makers to remote sensing in official statements prepared on sustainable development and other environment issues.

Space systems and remote sensing technologies are examples of new technologies which have contributed towards our understanding of global systems. Currently researchers using space data processing and interpretation, developing land/ atmosphere/ ocean models to further our understanding of earth systems by examining areas such as the ocean (ocean circulation, ocean waves, air – sea interaction etc.), ozone chemistry and trace gases and their interaction with climate change, sinks and sources of greenhouse gases, changes in land use and land cover (key for estimating global and regional carbon cycle), desertification and urban environments. More generally, S & T are equally fundamental to pursuing solutions to human health and social issues, from key human health questions such as AIDS to sustainable transportation.

By John Trinder, ISPRS President

Committee on Earth Observation Satellites (CEOS)

General

As an associate of CEOS, ISPRS was entitled to attend the 15th CEOS plenary, held in 2001 in Kyoto, Japan in November. ISPRS is progressively making an impact in CEOS, particularly through the Working Group on Calibration and Validation (WGCV), as described elsewhere in this report. ISPRS also has representatives on the Working Group on Information Systems and Services (WGISS), the Working Group on Education and Training (WGEdu), and the Disaster Management Support Group (DMSG). All of these groups in CEOS are very active and hence ISPRS should benefit from the collaboration with them.

Plenary

CEOS is also in the process of preparing a document for the World Summit for Sustainable Development (WSSD) in South Africa in September this year. Members at the Plenary were particularly concerned that in the past, the importance of remote sensing has received little or no recognition by decision makers, in terms of the role that it can play in monitoring sustainable development of the planet. The CEOS document will aim to redress this lack of recognition.

Other matters determined in the Plenary were: a review of the management of CEOS, programs for the CEOS Working Groups mentioned above; reports on two themes of the IGOS (Integrated Global Observing System) on Ocean and Carbon, and a recommendation for a new theme on the Global Water Cycle theme; a report on the CEOS database which now contains details of 179 missions; and an updated version of the CEOS Handbook. CEOS will be Chaired by Dr Stephen Briggs of ESA for the year 2002.

CEOS is made up of a plenary, (comprising members and associates), working groups (Calibration and validation (WGCV), Information Systems and Services, (WGISS), Education and Disaster Management Support), WGCV and WGISS each have a number of working groups.

CEOS Working Group on Calibration and Validation (WGCV)

ISPRS is represented on WGCV by Ian Dowman. WGCV meets in plenary session about once every 9 months, but most of the work centers around the sub groups:

- SAR Subgroup
- Microwave Sensors Subgroup
- Infrared and Visible Optical Sensors Subgroup
- Terrain Mapping Subgroup
- Land Product Validation Subgroup

All of these are of interest to ISPRS and Council is encouraging WG chairs to liaise with appropriate sub

groups. Of particular interest is the Terrain Mapping sub group which initiated several of the resolutions discussed below. Another important activity of WGCV is the Cal/Val Dossier which provides a single, on-line source of information about:

- Calibration/validation facilities
- Instrument calibration activities
- Calibration and validation test sites
- Point of contact links to agencies

WGCV put a number of resolutions to the CEOS Plenary which are particularly relevant to ISPRS. The first resolution called for a task force to be established with ISPRS on standardisation of radiometric and geometric sensor parameter terms. This is now being set up. The second resolution called on CEOS Plenary to contact commercial operators of Earth observing satellites to ask them to agree to the free exchange of calibration and validation data as adopted by CEOS agencies. This recommendation was discussed and accepted. Other resolutions and actions relevant to the group are that historical archives of space-borne SAR data held by CEOS agencies should be opened to the scientific community at cost of reproduction and that support for maintenance and development of the Cal/Val dossier should be continued. CEOS agencies should also provide a link to the CEOS dossier from their own web sites either directly or via a link to the CEOS web site.
Both CEOS WGCV and ISPRS recognise the importance of working together and current activities reflect that.

CEOS Working Group on Information Systems and Services (WGISS)

ISPRS is in the process of appointing an official representative to WGISS. However several working groups have links with WGISS.

By John Trinder, ISPRS President and Ian Dowman, ISPRS Secretary General

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United Nations Divisions

ISPRS is an accredited NGO with the UN Office of Outer Space Affairs (OOSA), UN Statistics Division, UN Economic and Social Council (ECOSOC), and the UN Department of Public Information (DPI). President John Trinder attended the UN Regional Cartographic Conference for the Americas in New York (organised by the Statistics Division) in January 2001 and presented a paper entitled 'Developments in Acquisition of Spatial Data from Imagery'. The President also attended the CODI-2 (Committee on the Development of Information in Africa) meeting in Addis Ababa, Ethiopia and presented a paper with a similar title. He participated in the formulation of recommendations in both meetings. A report of the CODI-2 meeting was included in the December 2001 edition of ISPRS Highlights.

By John Trinder, ISPRS President

COPUOS

ISPRS is a member of the United Nations Committee on the Peaceful uses of Outer Space (COPUOS). The President and Secretary General attended the 38th Session of the Science and Technology Sub-Committee 12-23 February 2001. The President attended the COPUOS plenary meeting in June. ISPRS was involved in planning two workshops, one in Kuala Lumpur on GPS and one on 'Making space applications operational - opportunities and challenges for sustainable development' at the UN/IAF workshop to be held before the IAF Conference in Toulouse.

By Ian Dowman, ISPRS Secretary General

International Union of Technical Associations and Organisations (UATI)

In 1997, ISPRS applied for a subvention from UNESCO through its membership of UATI for documenting the cultural heritage rock-hewn churches in Lalibela, Ethiopia. In 2001 UNESCO granted $US10,000 to ISPRS for this task. The Lalibela site is unique in its relevance for African heritage and an important tourist attraction for the region. The 'construction' of the monolithic rock church was in fact an excavation, the procedure being to first cut free a block of stone in the volcanic tuff, after which stonemasons chiselled out the church, shaping both the exterior and interior. There are signs of surface damage on some of the relatively soft tuff surfaces and further deterioration is expected. Photogrammetric recording of the churches for posterity was therefore considered highly desirable. The work was undertaken under the

direction of Professor Heinz Rüther of the University of Cape Town in South Africa. It is hoped that if the photogrammetric documentation can be extended to a spatial information system and made available on CD and/or the Internet, it will play a significant role in public education and above all contribute to the development of African awareness of African history. The documentation would also be available for analysis by historians, archaeologists, architects and conservationists. A full report of the work was published in 2001 in ISPRS Highlights.

Despite the success of this application for funding, ISPRS Council believes that the benefits of membership of UATI do not warrant the continued cost of membership fees, and hence made the decision in September 2001 to withdraw its membership, effective from 2002.

By John Trinder, ISPRS President

CIPA
The ICOMOS & ISPRS Committee on Documentation of Cultural Heritage

CIPA and UNESCO

CIPA has amended the contacts to UNESCO. In April 2001 a meeting took place in Paris on invitation of the UNESCO World Heritage Centre. The working plan of CIPA has been discussed and appreciated by its Director and Co-Director. The WHC accepted the invitation of CIPA to give a key-note lecture at the CIPA Symposium in Potsdam, which was held this time by Mario Hernandes, the responsible expert in the WHC for Heritage Information Systems. Mario Hernandes has been nominated as the permanent contact person for this working area of CIPA. UNESCO WHC is planning for a Virtual Real World Congress in October 2002 and asked for co-sponsorship of ISPRS. (The Council of ISPRS has nominated Prof. Dr. Heinz Rüther, South Africa, as contact person, CIPA nominated further the CIPA Secretary General Cliff Ogleby as a second liaison). WHC agreed principally that the technical preconditions for permanent monitoring of the World Heritage Sites are to be defined in more detail, but in co-operation with the experts of the respective States Parties and prior to any World Heritage contract. For the existing contracts an adequate solution has to be sought. Details are to be discussed within ICOMOS which is the official contractor of UNESCO for the evaluation of WH Sites and Cultural Landscapes, and with IUCN which is the corresponding partner of UNESCO for Natural Landscapes.
The President and the Vice-President of CIPA took part as observers in the 25th Meeting of the Bureau of the UNESCO World Heritage Committee in Paris in June 2002, when the act of vandalism against the Buddha statue of Bamyan, Afghanistan, was discussed. It was not known to UNESCO that photogrammetric documentation and already a restitution were available from an expedition in 1970 of the Austrians Roger Senarclens de Grancy and Robert Kostka. This demonstrated again that a meta-data-network on all cultural heritage documents is an urgent and essential task for the future. The terror acts in peace and war times against cultural objects urge us to pay much more attention to photogrammetric documentation and to Heritage Information Systems and Networks. The many contacts on the occasion of this meeting have been used to learn more about the special requirements of art historians and conservationists specially for monitoring and conservation of cultural and natural World Heritage Sites on the one side and to inform about CIPA's intentions to further these activities on the other side.

Events

The International ISPRS / CIPA Workshop on Recreating the Past (Visualisation and Animation of Cultural Heritage) in Ayuttaya, Thailand, 26 February - 1 March 2001, was a co-operation with ISPRS Commission V, WG V/5 and SIG, the Asian Institute of Technology (AIT), the Surveying and Mapping Society of Thailand, the Silpakorn University, the Seameo Regional Centre for Archaeology and Fine Arts (SPAFA), the Association for Real-time Imaging and Dynamic Analysis (ARIDA), ETH Zurich, the Asian Centre for Research in Remote Sensing, and with ICOMOS Thailand. Cliff Ogleby, Secretary General of CIPA, Klaus Hanke and Petros Patias represented CIPA. A report can be found at http://cipa.icomos.org/reports. html

A workshop of ISPRS Commission VII, Working Group 4 on Human Settlements and Impact Analysis, was held in Sopron, Hungary, 6 – 8 Sept.2001. This Workshop was chaired by Gabor Remetey-Fülöpp, Hungary. And brought some 50 experts together discussing issues of application of remote sensing to the monitoring of World Heritage Sites. It was co-organised with CIPA's Working Group 8 (Gebhard Banko, Vienna, Austria) on Photogrammetric, Remote Sensing and GIS applications for evaluation and monitoring of Cultural and Natural Landscapes. The proceedings are available from Gabor Remetey Fülöpp, Department of Lands and Mapping, Ministry of Agriculture and Regional Development, Kossuth Ter 11, H-1860 Budapest 55, Hungary, Fax: +36 1 301 4691, E-mail: gabor.remetey@fvm.hu

The XVIIth International Symposium of CIPA in Potsdam, Germany, 18 - 21 Sept. 2001, the first CIPA Symposium held under the auspices of UNESCO, was a great success. The Symposium Director was Joerg Albertz, Berlin. We had the honour that both the parent societies of CIPA were represented by their Presidents, ICOMOS by Michael Petzet, ISPRS by John Trinder, and that also UNESCO had sent its representative Mario Herlandes. 250 participants from 30 countries, 12 of the 18

Executive Board Members present, 24 of the then 49 National and Committee Delegates present, 14 of the 20 Working Group Chairpersons and Co-chairpersons present, 40 oral presentations, 80 poster presentations in two very well accepted poster sessions. Two half days were dedicated to excursions to various places of interest in the area of the World Heritage site of Potsdam and of course also to the famous Meydenbauer Archive. 20 posters best representing the manifold working areas of CIPA were selected for the Best Poster Awards. These posters will be shown in an exhibition at the next General Assembly of ICOMOS in order to demonstrate good examples of application of modern technology. The detailed reports will be published in the German, Austrian, French and English Journals. The printed Proceedings will be available from TU Berlin and from ICOMOS Paris by spring 2002.

ARCHAEO 2001, the 4th International Conference on Archaeological Prospecting, was held at the invitation of the Austrian Academy of Sciences in Vienna, 19-23 Sept. 2001. Also this conference was very well visited. About 200 participants discussed about 100 oral and poster papers. It was co-organised by ICOMOS Austria and CIPA's Working Group 5 on Archaeology. Unfortunately this symposium had to take place exactly parallel to the CIPA Symposium. It is planned that these two conferences will be arranged together in 2003 in Antalya, Turkey. The excellent Proceedings of this conference have been edited by Michael Doneus, Alois Eder-Hinterleitner and Wolfgang Neubauer (206 pages) and are available via internet under http://verlag.oeaw.ac.at/. Pictures of the meeting can be found at the homepage of the conference at (http://www.univie.ac.at/archeo2001/)

Annual Meeting of the CIPA Executive Board

After the Symposium the Annual Meeting of CIPA was held in Potsdam. 10 Executive Board Members were present (4 ISPRS, 4 ICOMOS Ordinary Members and 2 Associate Members). One ISPRS and one ICOMOS Ordinary Member were excused, the sixth ISPRS Member had resigned, this position is now vacant as also the sixth of ICOMOS.

The Executive Board decided about a new Logo of CIPA and about the new name. As earlier discussed, the "Architectural Photogrammetry" is a much too narrow field of work compared with the real needs of ICOMOS experts. To show that CIPA has changed in a provisional way we used the "CIPA – I2DOC" you may have read somewhere during the last year. The intention was to make the reader curious. Now we found a better solution, easier to write and to understand:

CIPA
The ICOMOS and ISPRS Committee for the Documentation of Cultural Heritage
(1969 – 2000: International Committee of Architectural Photogrammetry)
http://cipa.icomos.org

CIPA HERITAGE DOCUMENTATION

Please note that CIPA has also new permanent email addresses for the executives (left); but also the old addresses remain valid (right):

president@cipa.icomos.org
Peter.Waldhaeusl@tuwien.ac.at
vice-president@cipa.icomos.org
Letellier.R@ATTGlobal.net
secretary_general@cipa.icomos.org
C.Ogleby@eng.unimelb.edu.au
webmaster@cipa.icomos.org
Klaus.Hanke@uibk.ac.at

CIPA, ICOMOS and the GCI – The RecorDIM Initiative

Over the past two years, CIPA's Working Group 1 (WG1) and the Getty Conservation Institute (GCI) have been working together on a project, "Bridging the Gap", to improve the communication between Information Users (e.g. conservation specialists, site managers, etc.) and Information Providers (e.g., heritage recorders, building surveyors, photographers, photogrammetrists, etc.). It was also recognised that there is a pressing need to develop guidelines, handbooks, training and information dissemination pertaining to Heritage Recording, Documentation and Information Management.

Consequently, CIPA-WG1 and the GCI jointly organised a Plenary Session during the September 2001 CIPA Symposium in Potsdam entitled: Bridging-the-Gap between the Information User and the Information Provider. During this Session, Robin Letellier (Chair of WG1), Francois LeBlanc (GCI Head of Field Projects) and Gaetano Palumbo (for Giora Solar, ICOMOS' delegate to CIPA) presented the above-mentioned concerns and proposed a Recording, Documentation and Information Management (RecorDIM) 5-Year Initiative.

This RecorDIM Initiative focuses primarily on creating a partnership between CIPA, ICOMOS and the GCI to address the following needs:

- Organise round-table discussions to define the gaps between information users and providers
- Publish guidelines for heritage recording, documentation and information management
- Develop "how-to" handbooks for recording
- Create a web presence on these subjects
- Develop training opportunities and materials
- Develop further partnerships with appropriate and committed organisations

This RecorDIM Initiative proposal was discussed during CIPA's Executive meeting that followed the Potsdam

Symposium. The CIPA Executive saw this initiative as an effective way to integrate conservation specialists to CIPA's future activities, and to make CIPA's role more effective in answering to the needs of the heritage documentation field. Consequently, CIPA accepted to support the project and become a Partner in this 5-year RecorDIM Initiative.

During the last week in October 2001, Giora Solar presented the RecorDIM Initiative proposal to the ICOMOS Executive that met in Dubrovnik. The Executive Committee expressed in principle its support for the RecorDIM Initiative with the understanding that a plan will be provided as soon as available.

As a result of the Bridging-the-Gap Session in Potsdam, a partnership between CIPA, ICOMOS and the GCI has been initiated. The goal of this partnership is to raise the level of heritage conservation practice world-wide through the provision of supplementary guidance, training and information dissemination. To reach this goal, the GCI, ICOMOS and CIPA will join their efforts and resources to address the above-mentioned needs.

As announced by Francois LeBlanc during his presentation in Potsdam, the GCI will sponsor Round Table 1 to take place on 4-5 March 2002 in Los Angeles. During this 2-day meeting, conservation specialists from many diverse regions of the world, representing different conservation disciplines, will discuss and define the Gaps that, from their experience, exist between the information users and providers. These Gaps will be developed into focused Deliverables that will be addressed by Task Groups composed of partnership representatives.

The following Round Table (or Task Group) meeting is currently being planned to take place during the ICOMOS General Assembly in Zimbabwe in October of 2002. At this meeting, the Partners will review the work of Task Groups and report on the progress during the General Assembly.

Public Works and Government Services Canada, Real Property Services for Parks Canada, are considering sponsoring a further Round Table (or a Task Group meeting) possibly in the Spring of 2003.

The progress of the 5 Year RecorDIM Initiative will be reviewed at a Round Table planned to take place during CIPA's 19th International Symposium in Antalya, Turkey, from 30 September to 4 October 2003. One of the main objectives of this CIPA Symposium will be to significantly increase the participation of ICOMOS conservation specialists. In Antalya the results of Deliverables will be assessed and adjustments / refinements will be made to the RecorDIM Initiative. This assessment should determine the quality of outputs and future tasks to be addressed.

Participating organisations and liaison officers:

CIPA	Peter Waldhäusl
ICOMOS	Giora Solar
GCI	François LeBlanc / Christopher Gray

(others organisations should be joining this initiative in the near future)

Future Events

The ISPRS Commission V Symposium 3-6 Sept 2002 in Korfu, Greece: Symposium Director and President of Commission V is Prof. Dr. Petros Patias, Ordinary Member of CIPA. For further information see http://www.isprs.org/technical_commissions/tc_5.html.

The Annual Meeting of CIPA will be held in connection with this Symposium, but only before the symposium, 31 August – 2 September 2002, because many of the ISPRS Members have obligations afterwards.

The XIIIth ICOMOS General Assembly together with a Scientific Symposium will take place in Victoria Falls, Zimbabwe, from 14 - 18 October 2002. CIPA will present there the Best Posters selected in Potsdam and Korfu. The ICOMOS General Assembly is always a great event where the CIPA friends can meet members of other International Scientific ICOMOS Committees as well as many more culturally interested participants. The theme of the symposium: "Place, Memory, Meaning: Preserving Intangible Values in Monuments and Sites" will encourage to discuss perspectives of cultural heritage, which the African may see better than the too much "developed" European. For further Information see: http://www.international.icomos.org/ga2002.htm

The XIXth International CIPA Symposium 30 Sept - 4 Oct 2003 in Antalya, Turkey on "New Perspectives to Save Cultural Heritage" will be held again under the auspices of UNESCO. Symposium Director is Prof. Dr. Orhan Altan, Council Member of ISPRS and its Society Delegate in CIPA. This symposium will be closely connected to ARCHAEO 2003, the 5th Symposium for Aerial and Geophysical Prospection of Archaeological Sites. Detailed Information see the web-site http://www.cipa2003-antalya.com and by email oaltan@itu.edu.tr or gulersoy@itu.edu.tr

Members of the Executive Board (Status 1.1.2002)

Ordinary Members

*From **ISPRS** (International Society of Photogrammetry and Remote Sensing)*

Orhan **Altan** (Turkey) Society Delegate and Symposium Director
Pierre **Grussenmeyer** (France) Treasurer
Jozef **Jachimski** (Poland)
Petros **Patias** (Greece)
Peter **Waldhäusl**, (Austria) President
NN

*From **ICOMOS** (International Council on Monuments and Sites)*

Giora **Solar** (Israel), Society Delegate
Robin **Letellier** (Canada) Vice-President
Steve **Nickerson** (Canada)
Cliff **Ogleby** (Australia) Secretary General
Gaetano **Palumbo** (UK)
NN

Associate Members:
Communication and Web:
Klaus **Hanke** (Austria) (ISPRS)
Former Symposium Directors:
Joerg **Albertz** (Germany) (-2003)
Joerg **Haspel** (Germany) (-2003)
Next Symposium Directors:
Nuran Zeren **Gulersoy** (Turkey) Co-Director
Others:
Antonio **Almagro** (Spain)
Michael **Doneus** (Austria) Fin.Committee.
Andre **Streilein** (Switzerland) Fin.Committee
3 NN

Honorary Members
Maurice **Carbonnell** (France)(Hon.-Pres.)
John Badekas (Greece)
Carl-Wilhelm **Clasen** (Germany)
Mario **Fondelli** (Italy)
Elzbieta **Wanot** (Poland)

The CIPA Board of delegates increased to 55 officially nominated and approved members. (Status 1.1.2002). CIPA has today 50 National and 5 Committee Delegates. From the 50 are 28 from National ICOMOS Committees and only 22 from National ISPRS Member Societies. Only 14 countries have nominated delegates from both, ICOMOS and ISPRS.

By Peter Waldhäusl, CIPA President and Robin Letellier, CIPA Vice President

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International Society of Biomechanics (ISB)

ISPRS has a link with the International Society of Biomechanics (ISB) and is represented by Armin Gruen. The 18th congress of the ISB was organised by the Laboratory for Biomechanics of the ETH Zürich and the Institute of Biomedical Engineering of the University and ETH Zürich. It was housed from the 8th to the 13th of July at the central building of the ETH in Zürich. The organising committee was proud to have the congress back in Zürich, where the first Seminar on Biomechanics was held in 1967.

There were 9 keynote lectures, 370 oral presentations divided in 5 parallel sessions and up to 400 poster presentations. The sessions were classified in 11 different topics: hard tissue, soft tissue, muscle, bone, locomotion, orthopedics, sport, neuromuscular control, biomaterials, biofluidmechanics and others.
Relevant for ISPRS are the topics related to orthopedics and sports biomechanics. Especially interesting for photogrammetry was a session dedicated to motion capture techniques. The problem of calibration remains a key issue for the achievement of highly accurate measurements. Several papers have been presented to that topic. Fast, accurate and user friendly systems are aimed at in biomechanics. An interesting application of photogrammetric techniques in medicine is the NSCP (Non Stereo Corresponding Points) stereoradiographic 3-D reconstruction technique, which uses two X-ray images (front and lateral). One study of this technique used 2-D contours for the reconstruction of the femur (presented by Laporte from the Ecole de Technologie Supériore of Paris, France). Various applications of photogrammetric motion capture systems were presented for motion analysis and kinematic studies in orthopedics and sports biomechanics, however without new developments in the used technology.

By Armin Gruen

International Standards Organisation (ISO)

ISPRS is a liaison member of ISO/TC211 'Geographic Information/Geomatics' and has a commitment to supporting efforts to establish standards for data format and transfer. ISPRS also supports efforts for interoperability and data transfer through the Open GIS Consortium (OGC). In order to implement this support, explicit reference to ISO and OGC is made within the terms of reference of the following Working Groups:

- WG I/1: Define standards for sensor parameters
- WG II/2: Systems for SAR and Lidar processing
- WG II/4: Image data standards
- WG IV/2: Federated databases and interoperability
- WG VII/6: Monitoring and modelling global change

The most important of these is WG II/4 which has the specific remit to develop image standards. The chair and co-chair of WG II/4 are leading the ISO project 19130

"Sensor and data models for imagery and gridded data". The WG has established links with many other groups working in this area. The progress of the work on the standardisation of the frame camera and of the pushb-room/swath-type of sensors is also good. More work is necessary for the SAR- and LIDAR-systems.

The chair and co-chair of WG II/4, Wolfgang Kresse and Liping Di, and the ISPRS representative to ISO/TC 211, Hans Knoop attended the ISO/TC211 Plenary meetings in Lisbon and Adelaide during 2001. There are plans to hold a meeting on standards with FIG at the FIG Congress in Washington DC. In April.

ISPRS is also making input to ISO Project 19122 'Geographic Information/Geomatics: qualifications and certification of personnel'. FIG is playing a leading role in this and ISPRS delegates will attend a meeting on this topic at the FIG Congress in Washington DC in April 2002.

By Ian Dowman, ISPRS Secretary General

SPIE

ISPRS working groups have been involved in organising sessions at a number of SPIE conferences. Discussions are currently in progress to agree a Memorandum of Understanding so that there can be reciprocal co-sponsorship of SPIE and ISPRS events.

By Ian Dowman, ISPRS Secretary General

Publications and ISPRS Journal

Annual Report ISPRS Highlights 2001

In 2001 we have produced Volume 6 of ISPRS Highlights. It is being produced in good teamwork between the ISPRS Secretary General (Ian Dowman), the Publisher's Production Manager (Sandra Visscher) and the Editor-in-Chief (Lucas Janssen).

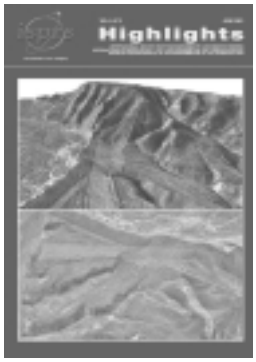
Production is planned in such way that the issues arrive at the 1st of the Issue's month. The current situation with distribution is that Highlights is send to 450 persons or companies directly, rather than bulk mail to members (1,400 copies). We aim to increase the 'direct mail', among others to attract advertisers. Shortly after publication, Highlights is published on the Society's internet site (as PDF).

At different times the Editor invites Council and TCP's to send in material. Although some of us contribute regularly, the relative low input from Society members remains a fact-of-life.

Statistics regarding ISPRS Highlights in 2001

Issue	Nr pages	Print run	Remarks
March Vol 6.1	64	2100	Annual Report 2000
June Vol 6.2	48	2100	-
September Vol 6.3	48	2100	-
December Vol 6.4	48	2100	-

By Lucas Janssen, Highlights Editor-in-Chief and Johan Boesjes, GITC BV President



ISPRS Journal of Photogrammetry and Remote Sensing

Administrative Matters

The new Editorial Advisory Board for the period 2001-2004 was finalised at the end of February 2002, with substantial increase of members from remote sensing and particular spatial information sciences. The Editor was invited to Joint Council/TCP meeting In London last September and presented matters related to the Journal. In particular the role of the new technical commissions and working groups with respect to the journal has been discussed and the preparation of special/theme issues of the journal. After this meeting, a meeting with Elsevier took place in Oxford.

Papers, Reviews and Publication Time

The paper queue has increased, and combined with slower processing, has led to longer publication times. The quality of papers and reviews has deteriorated. Copy-editing and language editing are mostly done by the editor, whose administrative load has considerably increased. Due to various problems, publication delays are occurring. The low level of scientific output from ISPRS, which typically occurs after the Congresses, has also negatively influenced both regular papers and special/theme issues.

Electronic Subscriptions, On-line Electronic Journal

Electronic subscriptions in 2000 were 141 involving 87 consortia. This data is incomplete with many subscribers missing. Elsevier has been unable to provide complete information on such subscriptions since September 1999. Accesses of full text-papers at Elsevier's WEB site have increased from ca. 200 in January 2001 to 1,300-1,400 in the period April-June 2001. The papers now appear as extended Summary (abstract, outline (section titles), figures, tables and references), HTML (with increasing number of links to abstracts and full papers for references) and PDF files.

Hardcopy Subscriptions

Following the trend of recent years, common for most peer-reviewed journals, subscriptions declined from August 2000 to August 2001 by about 4%. In spite of cheap subscriptions for individual within ISPRS members ($40) and institutions from developing countries ($50), these subscriptions did not show any great increase (although concrete numbers for these subscription categories could not be provided by Elsevier), making clear that they have to be made more widely known, especially exploiting the Symposia in 2002. Correct order forms for these cheap subscriptions have appeared on Elsevier's WEB page after a delay of one year. Personal (non-ISPRS) and institutional subscriptions for 2002 have increased by 5% and 6.6% respectively.

Special/theme Issues

The following issues have been decided for the period until the next Congress or are under preparation, most of them with active involvement of Technical Commissions and their WGs. Another 2 proposals by Commissions III, and IV/II have been accepted and their topics are under discussion.

- Image spectroscopy and hyperspectral imaging: A. Skidmore, F.Van der Meer. Should be ready in early 2002.
- Geomatics in Mountainous Areas - The International Year of the Mountains, 2002: A. Gruen. S. Murai. Planned for late 2002.
- Fusion of geodata and imagery for revision and updating purposes: Christian Heipke, Felicitas Lang and Ammatzia Peled. Planned for early 2004.
- Algorithms and Techniques for Multi-Source Data Fusion in Urban Areas: P. Gamba, O. Hellwich, P. Lombardo. Planned for Spring 2003.
- Challenges in Geo-Spatial Analysis and Visualization: M. Madden, J. Schiewe. Planned for Autumn 2002.
- Medical Imaging and Photogrammetry: F. Van den Heuvel. Planned for Summer 2002.

Varia

Gratis ads were published in the journal for Commission Symposia and Call for Papers for special/theme issues.
ISI's impact factor was 0.692 in 2000 compared with 0.492 for 1999 and 0.132 for 1998.
The new ISPRS logo was added to the journal cover.
According to the ISPRS Webmaster, from January to September 2001 there were requests from about 10,000 different IP addresses (generally different persons) at the journal's page of ISPRS.

By E. Baltsavias, Editor-In-Chief

ISPRS Home Page

Introduction

The homepage of ISPRS has turned out to be one of the most important components of ISPRS communications. It provides online information about the society and links the various activities of ISPRS. Since September 2000, ISPRS server is hosted in ETH-Zurich and is always accessible under the Internet address 'www.isprs.org'.

As November 2001 there are about 450 HTML pages with approximately 160000 lines of information available on the ISPRS web site, i.e. ca 90 Megabytes of data.
In April 2001, a search engine (provided by Google) has been introduced inside ISPRS 'Table of Contents', with the possibility to search for pages inside ISPRS server or inside the WWW.
Thanks to the reservation of the international domain 'isprs.org', all Technical Commissions and Working Groups

Figure 1: Number of ISPRS Member Organisations, Technical Commissions and Working Groups with own web-pages.

can now be reached at unique URL like www.commissionX.isprs.org and www.commissionX.isprs.org/wgY At present (November 2001), all Technical Commissions have a personal homepage. Instead about 50% of the Working Groups and 40% of the Member Organisations provide information on their own web-pages (Figure 1).

Statistics of ISPRS Server

The statistics give a reasonable estimate of the use of the ISPRS web server, as it counts only requests for single HTML documents and the requests for images, graphics, icons etc. are not taken into account. Moreover, the statistics refer only to the requests made from outside the ETH domain, which excludes all the accesses during maintenance of the documents.

In Figure 2 is shown the monthly report of the number of requests to ISPRS server, in the period January 1995-November 2001. An increasing interest of the community for the ISPRS homepage is evident: the steady increase of the use of the HTML documents over the years and especially after the registration of ISPRS domain (1999) is obvious. The data missing from the figure in the period July-August 2000 is due to the movement of the server from Delft to Zurich. The pick of October 2001 states 90,500

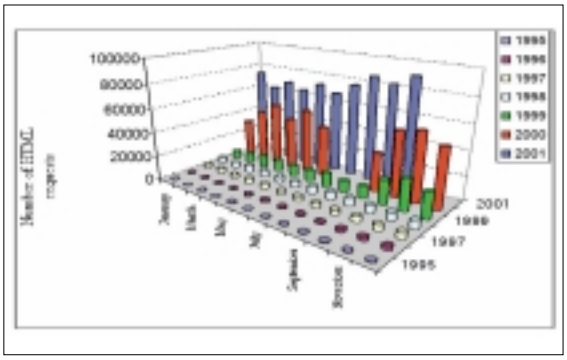


Figure 2: Number of monthly HTML requests on ISPRS server in the period January 1995-November 2001.

requests to ISPRS server. In 1995 the average of monthly requests was 424, in 1998 the average was 5,780 while at present ISPRS server has an average of 75,000 requests per month (see Figure 3). This is a mean of 2,500 successful requests per day, ca. 104 per hour or 1.7 requests every minute. The different domain (~country) served at least one by the server were 133 (ca. 55% of the registered country code domains), while the distinct hosts served (~users) were ca. 37,000 with an average of 20Mb of data transferred per day.

Another interesting statistic concerns the words and queries used in the search engines to find ISPRS and its related pages: between 7000 words, the most used are remote (9%), sensing (8%), photogrammetry (7%) and isprs (5%). Considering all the queries, the most requested are 'photogrammetry', 'isprs', 'remote sensing', 'orange book', 'International Archive of Photogrammetry and Remote Sensing'. The browser most used to find information related to ISPRS is Microsoft Internet Explorer (48%), followed by Netscape (26%) (Figure 4, left). The majority of the users (67%) has Windows as operating systems; then Unix (9%) and Macintosh (2%) (Figure 4, centre). The information (directories) more requested contain the events calendar (15%), the publications (11%) and Technical Commission (8%) (Figure 4, right).

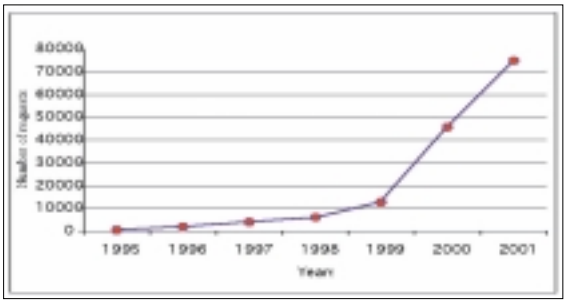


Figure 3: Average number of request per year to ISPRS server in the period 1995-2001.

Educational Resources on ISPRS Web-site

ISPRS educational page (http://www.isprs.org/links/tutorial.html) tries to collect the wide gamma of educational material, software and online publications related to Photogrammetry, Remote Sensing and GIS. It is not a complete list of all the documents available on the Internet, therefore if anyone wanted to contribute in this list, please send links or information to fabio@geod.baug.ethz.ch. A bigger database of education-related links is provided by Working Group VI/1 (http://www.commission6.isprs.org/wg1/).

By Fabio Remondino, ISPRS Webmaster

ISPRS Events Calendar

Introduction

The ISPRS Events Calendar is published in the quarterly ISPRS bulletin, ISPRS Highlights, and rapidly updated on the ISPRS Web Site. The Calendar contains a list of all ISPRS and Sister Societies (FIG, ICA, IAG, IHO, IGU, etc.) sponsored and co-sponsored congresses, conferences, symposia, workshops, tutorials, meetings, and other events. It also contains details of all international and national events on topics related to the activities of ISPRS, including those in photogrammetry, remote sensing, spatial information systems, geomatics, surveying, mapping, machine vision, image processing and similar areas.

The purpose for ISPRS is to allow WGs and Commissions to identify open dates or events which they may link up with or avoid conflicting with. This avoidance of conflicting with other events externally and definitely internally is a major responsibility of ISPRS. We publish the calendar to encourage others to do likewise. It is important that we cover events which are on the interdisciplinary boundaries of ISPRS so that our Commissions and WGs are aware of who and how they can interface with related organisations.

The Events Calendar Editor respectfully asks all of you to submit the details of their congresses, conferences, symposia, workshops, tutorials, meetings, and other events.

Versions

The WWW page of ISPRS Events Calendar (http://www.isprs.org/calendar.html) is updated as rapid as possible to keep it always up-to-date. This version will be modified as soon as the new information or amendment has been known, and therefore should be used as the main reference.

The ISPRS Events Calendar will be sent to all members of ISPRS Council monthly as a general reference. The Council could check the details, and then send their comments or corrections to the Events Calendar Editor, e.g. the confirmation of ISPRS Events and the co-sponsorship of other events.

The ISPRS Events Calendar will be sent to ISPRS Highlights quarterly for publishing on this bulletin. The disadvantage of this version is that the deadline is 40 days before the issue date, therefore this version is not up-to-date and should be used for rough reference only.

An Automatic Searching System

The ISPRS Events Calendar Editor has established an automatic system to search useful information for this Calendar on the Internet. The system is using the newest technique of searching engine and programming tools for web pages and Internet server. Following software, operating system, programming languages, and programming tools have been used: Microsoft Windows 2000 Server, Microsoft SQL Server 2000, Microsoft .NET Web N-tiers, IIS, Microsoft Office XP, Dynamic HTML, XML/SOAP, JAVA Script, VB Script, CGI, ASP, PHP, Delphi, etc.

By Tuan-chih Chen, Editor

Financial State of Affairs

The outgoing year will be remembered by the global situation rather than by any particular society event. The Amsterdam Congress seems now far away and the change of office had no effect on the Treasurer's work that is continuously in progress. Occlusions, discontinuities or any other irregularities are unacceptable in the financial function. It would be nice to have a simple harmonic flow yet the omissions and the "early birds" who pay their contribution a year ahead seems to be the real thrill of this work. Yet, some new changes have to enrich our experience. The outgoing Council resolved to hire some professional assistance for financial and accounting. After some discussions and deliberations based on distant-work difficulties, Council resolved to run the financial affairs without the assistance of the financial advisor. This will also manifest in an expenditure cut that might help in furthering other projects.

As reported previously, for logistic reasons, outgoing Council opened new Bank accounts at the UBS-AG branch in Zurich. On 31.12.2000, the "old" account at the UBS-AG branch in Lugano was finally closed, after serving our Society for so many years. The fixed annual contribution rates offered in US$ and SFr proved to be very helpful. Yet, again, one member has chosen to send a cheque drawn in EUROs. I hope this was the first and last tribute to the new European currency and all other members will find other gestures to hail the Europeans.

Last but not least, ISPRS forwarded this year additional SFr 50,000 to the Istanbul 2004 ISPRS Congress organisers. Together with previous advances (total of SFr 100,000), this loan will help the Congress organisers with cash flow problems, typically to the first two years of the four inter-congress years. All this advances where made gradually. Thus, affecting mainly our cash flow and very little effect on our investments. It is the basically healthy

financial standing of ISPRS that allowed us these transactions and I take this opportunity to thank previous Treasurers and mainly our Members who take care to pay their contributions early on upon receiving the invoices rather than at the end of the year.

As always, it is a major task of the Treasurer and Council to keep ISPRS in continuing good financial standing. This is implemented by seeking new Members, of course, but also by encouraging all members for prompt payment of their subscription. At this moment ISPRS still have some members who have outstanding dues. During 2001, all Council members where engaged with contacting these members. In some cases they have succeeded to re-establish the standing of such "sleepers". In some cases Council resolved to stop the participation of non-co-operating Member Societies and to designate new organisations to replace them.

This work will continue through 2002. Before taking actions, as ordered by the XIX General Assembly, all organisation members who may have outstanding dues are encouraged to please contact President Trinder or Treasurer Peled and make arrangements for payment prior to April 2002.

In spite of these some overdue payments, it can be stated that the Society is in good financial health with a sound and secure investments. Also, I'm happy to report that the contributions made between 1.4.2000 - 31.12.2001 are the same as was between 1.4.1999 - 31.12.2000. Having in mind that the previous year was a "Congress Year", it seems that the amount of contributions in the FY2001 will surpass last year contributions as a token of a better payment regime.

To conclude, 2001 proved the strength of the Society and gave much hope for the future. I'm most confident that, with members help, we will continue to keep the financial health of ISPRS in the same excellent manner.

By Ammatzia Peled, ISPRS Treasurer

Membership

Current Status of Membership (31 December 2001)

Membership type	Category	No 31.12.01	No 31.12.00
Ordinary members	1	41	41
Total No: 103	2	27	27
	3	11	11
	4	8	8
	5	5	5
	6	4	4
	7	2	2
	8	5	5
Associate members	1	8	7
Total No: 12	2	2	2
	3	1	1
	4	1	1
Sustaining members	A	7	7
Total No: 51	B	7	7
	C	13	13
	D	24	23
Regional members		9	9

Changes in Membership Since 1st January 2001

New Members

Associate members:

- National Institute of Aeronautics and Space, Remote Sensing Technology and Application Center, Division of Natural Resources and Environmental Monitoring (NREM) Cat 1

- National research Council of Thailand replaced by Geo-informatics and Space Technology Development Agency Cat 1

Sustaining members

e-HD.com	S Korea	Cat D
Infomap	Srpska Bosnia and Herzegovina	Cat D
Supresoft Inc*	China	Cat C
Seagate Computers*	Nepal	Cat D

* To be confirmed

Retiring members

Sustaining members:
Simmons Aerofilms
AeroSensing

Liaison with Sustaining Members

There have been no meetings of sustaining members in 2001. A meeting will be organised at INTERGEO in Frankfurt on October 2002. The Congress Director is organising this.

Council has planned a drive to attract new sustaining members and note the following advantages of membership of ISPRS:

- WORLD WIDE exposure for the company/organisation
- Preferential treatment and reduced Exhibitor rates. (10% reduction for Istanbul 2004.)
- A company profile each year in the Society's bulletin ISPRS Highlights
- Receive complimentary copy of "Part A, International Archives of Photogrammetry & Remote Sensing"
- Receive annual copy of ISPRS Member Address List
- Receive ISPRS Highlights every 3 months, which includes the Annual Report
- Preferential rates for advertisements in ISPRS Highlights
- Receive a copy of ISPRS Organization and Programs book
- Notification of ISPRS opportunities - Working Groups, tutorials, seminars
- Invitation to Sustaining Member meetings
- Entitlement to use ISPRS logo