ISPRS Society

XX Congress - A Glance at Turkish Architecture

By M. Orhan Altan, ISPRS 2004 Congress Director

Turkey is one of the most ancient settlement areas of the world as four seasons are encountered on the fruitful land on which thousands of plant grows.

It is possible to find the traces of the Glacier Period in Anatolia. The Karain, Beldibi and Belbaşı caves which are located in the vicinity of Antalya, were used by mankind during the end of this period (BC 20.000 – 8000).

Figure 1: Dolmabahce Palace.

During the Neolithic Age (8000 – 5000 BC) mankind had attained the status of what can be called civilised by founding permanent settlements. The two most advanced settlements were the Hacılar and Catalhoyuk settlements located in Central Anatolia. In Catalhoyuk settlement, mankind was accommodating abode huts whose walls were decorated by illustrations and colourfully embossed designs.

The Hattis, Hittites, Frigs, Urartus, Phrygians, Lydians, Karians, Ionians, Hellens, Persians, Romans. Byzantines, Seljuks and Ottomans which settled in Anatolia all left the marks of their civilisations on this land. In many ways the art works which is found all over Anatolia can be considered as a mosaic of the art of many nations which settled on this land.

Turkish architecture can roughly be divided into three main categories: religious, formal or state and folk. Numerous fine examples of religious architecture i.e. mosques, tombs of the sultans and their families can best be seen in Istanbul, Bursa and Edirne, former capitals of the Ottoman Empire. Similarly formal or state architecture can also be seen in these cities, particularly in Istanbul where the three surviving imperial palaces, Topkapı, Yıldız and Dolmabahce (Figure 1) are all well maintained and are open to the public. All three are completely different in period character reflecting the architectural trends of the period.

The Turkish houses can be defined as those in which Turks have lived throughout their history. Since they first appeared on the stage of history, their settlements have been greatly diversified. In our definition of the Turkish house (Figure 2), we can include houses that were inherited from the Ottoman Empire, some remaining examples of which can be traced back to the 17th century.

Taking a closer look at what we call "folk architecture" or architecture for the people by the people : First the loca-

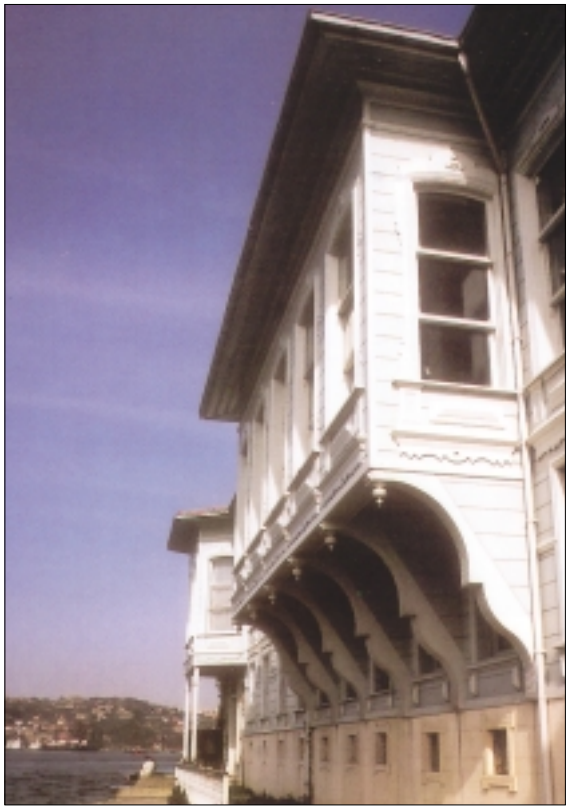

Figure 2: An old Turkish house.

tion of the house is of great importance and must be near the source of livelihood (Figure 3). The ground must be on stable ground and unlikely to be flooded. It should not take up valuable farming land.

Privacy must be respected and a reasonable distance between each homestead must be kept. It should be within easy reach of the water source.
Houses are nearly always built facing south for warmth and light during the winter months. The door however should face east toward Mecca.

There are two types of such houses. Those only used in summer by the herders in summer in the high pastures, simple seasonal and those of more permanent construction in the valleys. The latter consist of two rooms upstairs with stables for the animals below. The material used depends on local availability and the design tends to change little since no trained architect is involved. Roofing varies with the climatic variations, flat where it is hot and dry or sloping steeply where snows and rains are prevalent.

Urban houses of the Ottoman period are the most representatives of what is here known as a typical "Turkish House". Those are always two floors with the upper floor jutting out over the street, the ground floor being surrounded by a high wall and a courtyard. The frame would

Figure 3: Folk architecture.

Figure 4: A typical room decoration.

Figure 5: A more modern decoration.

be of timber filled in with local materials such as brick, plaster, stone or wood. The eaves would be wide to provide shade and shelter from the elements. The timber jutting from the house provides an opportunity for carving and decoration reflecting the artistic trends over the years. The inside of the house is primarily based on the concept of the nomadic way of life, the centre room or divan with other rooms leading of it as would the tents of the nomads (Figure 4). Rooms would be sparsely furnished with sofas around the walls and fitted cupboards containing mattresses, yorgan and pillows. Windows would be latticed, open to provide a cool breeze. In this way privacy would be maintained.

Figure 6: A modern business centre, Istanbul.

A large tray or sini would be brought into the divan at meal times and the food carried from the kitchen usually situated outside the main house.
Sadly, this typical type of Ottoman house is fast disappearing but can still be seen in isolated packets. Though fortunately there are a few restorations.

During the nineteenth century, the architectural trend shifted to baroque and neo-classical style. Especially in the Pera section of Istanbul it is possible to see buildings built in this style (Figure 5).

Today the architectural style tends to be ultra modern and skyscrapers are built in the big cities like Istanbul, Ankara and İzmir. However the Turkish people believe in tradition and they try to protect their heritage by restoring and preserving the old (Figure 6).

ISPRS Homepage: Educational Material Available

By Fabio Remondino, ISPRS Webmaster, E-mail: fabio@geod.baug.ethz.ch

The ISPRS website (www.isprs.org) has turned out to be one of the most important components of ISPRS communications, providing information about the society and linking its various activities.
Between the 620 HTML pages available, the educational material occupies a great part and it consists of:

- Education-related documents (various documentation divided in ISPRS fields of interest): we try to collect the wide gamma of educational material, software, tutorials, courses, glossaries and codes related to Photogrammetry, Remote Sensing and GIS (www.isprs. org/links/tutorial.html). More educational links can also be found in the webpages of ISPRS WG VI/1 (www.commission6.isprs.org/wg1/).
- Online proceedings from ISPRS events, EuroSDR/OEEPE workshops, CIPA, etc. (www.isprs.org/publications/online_proceedings.html).
- Proceedings of ISPRS mid-term symposia 2002 as well as tutorials and keynotes (www.isprs.org/specials/symposium.html).
- Archive of job opportunities in the field of to Photogrammetry, Remote Sensing and GIS (www.isprs.org/job_opportunities/index.html)

Moreover, to keep the users informed about new and updated events, call for papers or recent announcements, a mailing list has been activated: it contains already more than 220 users and you can subscribe at this newsletter at www.isprs.org/feedback.html.

International Policy Advisory Committee of ISPRS

By Ray Harris, Department of Geography, University College London, UK,
E-mail: r.harris@geog.ucl.ac.uk

During the year 2003 the International Policy Advisory Committee (IPAC) has been examining several policy issues concerned with remote sensing, in particular sustainable development, the benefits of remote sensing and access to remote sensing data. Papers on these subjects have been submitted to the ISPRS Council for discussion and further action.

This article presents the reports from IPAC on these three issues in ISPRS Highlights as a means of interacting with a wider audience. **Comments on the issues raised here are invited to ISPRS Highlights as letters to the editor.**

The members of the International Policy Advisory Committee in early 2003 were:
Ade Abiodun (Nigeria), Raul Colomb (Argentina) Joanne Gabrynowicz (USA), Ray Harris (chair, UK), Yukio Haruyama (Japan), John Neer (USA), D P Rao (India), Gunter Schreier (Germany) and Frans von der Dunk (The Netherlands).

Sustainable Development

Indicators and Their Limitations

While there has been some examination of using indicators to measure sustainable development, the role of remote sensing so far may be only partial. A pure remote sensing approach, which just measures geophysical parameters, probably cannot capture the full information required, and there needs to be an interaction or fusing between the physical sciences and the social and political sciences. Remote sensing has been used to measure indirectly some social science variables, for example population and Gross Domestic Product (GDP) estimated using the DMSP city lights data set.

A good example of a focus for sustainable development that combines geoscience and social science is water availability, particularly drinking water availability. This subject contributes to the main UN conventions related to sustainability, namely those on climate change and on combating desertification.

The perspectives of different nations do have a bearing on the potential of remote sensing data for sustainable development. The concerns of the less developed countries are often more practical than those of western nations, and the practical contributions of remote sensing data should be stressed.

Access to Data

Access to remote sensing and related geographical data remains a difficulty, particularly for the less developed countries. In many countries there are restrictions on access to remote sensing data of high spatial resolution and to map data of a useful spatial scale. For example in

some countries the national mapping agency provides maps openly to the public, and international scientists only at a maximum spatial scale of 1 : 1 million, even though maps exist at (say) 1 : 10,000 scale.

The legal basis of remote sensing is becoming firmer and guiding the data suppliers to provide data on a more open basis. A starting point is to be found in general international legal principles on access to data (for example the 1986 UN Principles and WMO Resolution 40), where for example UN Principles X and XI call upon states to disclose information promoting "protection of the Earth's natural environment" and "protection of mankind from natural disasters", which in an abstract sense could well be argued to include sustainable development. Such principles are not formally legally binding as such, and moreover contain too many loopholes and leave too much room for individual interpretation to be really effective. As data policy analyses have shown, there is still a lot to be achieved in tightening the international law parameters for such purposes. There is though a presumption of openness that supports greater availability of remote sensing data for the following reasons.

1. The UN Principles have achieved customary status because they have been negotiated and accepted for more than 25 years.
2. Non-discriminatory access policies have been adopted by major remote sensing nations, e.g. Japan, USA, Canada.
3. The data policies of some remote sensing missions (e.g. Envisat, Radarsat) specifically incorporate non-discriminatory access.

Although there is pressure from some quarters to reduce non-discriminatory access, the need to have open availability of remote sensing data to support sustainable development should continue to be stressed.

Institutional Framework

ISPRS can usefully provide an independent forum for making progress with the ideas of remote sensing, geoscience and social science data in aid of sustainable development. The institutional context is essential, and ISPRS should continue to work with UNEP, UNDP, CEOS and IGBP to find the most suitable and practical way forward. The meeting planned for September 2003 in Graz, Austria on the subject of the 'Use of Space Technology in Support of the Plan of Implementation of the Outcome of the World Summit on Sustainable Development' may prove a fruitful avenue for ISPRS to act as an independent authority to contribute to the theme of the meeting.

Conclusions on Sustainable Development

Sustainable development issues should be tackled using both geoscience and social science. ISPRS is in a strong position to promote this theme, and to emphasise the variety of perspectives from countries at different stages of economic development. The subject of water availability provides a potentially useful focus in this area.
ISPRS is in a strong position to continue to press for easier and more open access to remote sensing data in support of sustainable development.

ISPRS should continue to act within an international institutional context to ensure that the role of remote sensing in sustainable development is given its full recognition.

Benefits of Satellite Remote Sensing

Balance of Benefits

It has been clearly recognised by many that the benefits of satellite remote sensing and wide and varied. However, when we try to capture the benefits against the costs of remote sensing, the strictly economic benefits are (1) relatively small and (2) are typically not appropriated by those organisations that carry the costs.

There are many services, which depend on Earth Observation data, that government establishments are expected to provide to the society. In many of these instances while the cost of data may be quantifiable, aspects of the economic and social benefits may not be amenable to such quantification monetarily. For example, how much monetary value does one want to place on the life of a human being rescued from a natural disaster that benefited from the use of Earth Observation data? On the other hand, particularly in areas such as property management, business applications, development and management of utilities, tourism and agricultural production, the application of monetary cost/benefit ratios is practicable. In the case of geostationary meteorological satellite data, for example, the benefits are estimated at more than one billion US$, although meteorological data are essentially provided free of charge.

The economic return on information (ROI) for satellite remote sensing is in direct proportion to the users' ability to address specific natural and manmade issues. The value of remote sensing systems is in the value added exploitation of the data, not in the creation of it via satellites. Within the US government there is a historical rule of thumb that suggests there is an economic force multiplier effect that comes from information such as that provided by satellite remote sensing: spend US$1 on information and it leverages 5-10 times the investment. Investing in information leverages the economic strength of a nation.

Tangible and Intangible Benefits

The benefits of remote sensing are both tangible and intangible. The intangible benefits are far more numerous than the tangible ones and typically are long term social benefits, not easy to convert to monetary values. In Indian, for example, satellite remote sensing data have been extensively used in many fields of development such as mapping, environmental impact assessment, disaster management, pollution control, communications, environmental forecasting, urban planning, source-finding for drinking water and associated water conservation planning, in addition to research

applications including global change. All of these applications are helping immensely in the Indian national effort toward sustainable development. The Indian experience indicates that when compared to conventional methods, satellite remote sensing methods are cheaper and faster at least by a factor of 2 to 3, and more in some cases.

The social benefits are intangible. Depending on the area of application, some benefits could be immediate, some short term and many are long term. For example, during the 1970s, coastal cyclones on the Indian east coast resulted in thousands of deaths. Since the 1970s very few deaths have been reported because of improved meteorological forecasting combined with early warning systems that help in evacuating the people of the area to shelter homes. This is an example of immediate benefit, here saving human lives, which cannot be equated with monetary benefit. Locating drinking water sources for villages (with no existing source) is a short term benefit. Arresting land degradation and restoring its past productive status is a long term benefit.

The Wealth of Nations

Benefits are often expressed as economic benefits. However, a pure GDP approach only recognises the "kinetic energy" of a nation to produce wealth, it does not properly value the "potential energy", i.e. the wealth stored in its people and natural resources. If there were a way to value this potential energy (like oil in the ground) and apply remote sensing information as an "economic multiplier" more investment could be made or at the least justified. There is a role for international organisations to develop improved means of estimating the wealth of nations. Satellite remote sensing data can be seen as an information raw material on which wealth can be built.

In order to achieve benefits from remote sensing, it is not merely enough to acquire satellite data. Countries need the necessary infrastructure facilities integrated into national actions and manned by trained personnel who are capable of converting data into information. The use of such information for decision making requires institutional support and, for implementation and follow up, necessary budgetary support. This also means political commitment supported by approved policies and effective implementation of the policies. Any shortfall in these requirements results in a failure to show visibility of the benefits of remote sensing. Perhaps this may be the reason why in many developing countries we do not see the benefits of remote sensing on a scale that makes it visible. If the developing countries need to develop fast, the use of remote sensing is an imperative and not a choice.

Access to Satellite Remote Sensing Data

Economic Issues

Satellite remote sensing data that are not free of charge are often regarded as expensive. This is in part because of the difficulty of capturing the benefits as discussed above. However, most if not all satellite remote sensing data are sold at a loss in a commercial sense. Landsat data cost the US government about US$2000-3000 per scene, where a scene is a 1deg x 1deg latitude/longitude cell or about 3600 sq. nautical miles. This is a simple calculation based on total capitalisation and operations costs over the lifetime of the Landsat satellites. The US government sells a Landsat scene at a price of about US$600. A cost of $2500 and a sales price of $600 does not make a commercial business case. SPOT data sales recover the costs of the ground segment of the SPOT system but not the investment costs in the SPOT satellites.

This mismatch of a perception of high prices yet a fact of low prices is hampering the development of a mature remote sensing sector. One solution is for an organisation to buy satellite remote sensing data in bulk and then make the data available to a selected community. This has the potential to satisfy the data providers on the one hand because commercial prices can be established, and the users on the other hand because data could be made available at (say) the marginal cost or even for free. A version of this approach is under active consideration in the Landsat Data Continuity Mission, and has been discussed in Europe in the context of the Global Monitoring for Environment and Security (GMES) initiative. For the less developed countries, particularly in Africa, the UN could play an active and fruitful role here.

The global picture of satellite remote sensing is changing. In the past there were only a few suppliers of data, and these were located in western nations, but now there is a dramatic increase in the number of remote sensing satellite launches by less developed nations, for example Algeria and Nigeria in the Disaster Management Constellation (DMC). This change in the number and the type of nations launching their own missions could help to promote data sharing in specific geographical regions, in a sense a further form of bulk buying of data. This in turn places more emphasis on the needs for infrastructure and for trained manpower to turn data into information and information into knowledge.

Downlink Access

Commercial operators are concerned that the resources of their satellites are used by paying customers, i.e. costly data recording time is reserved for paying customers. If these resources are not used and their use would not mean additional costs and/or technical problems, commercial satellite operators might not be concerned how they are used. In other words, when a high resolution commercial satellite is imaging parts of (say) Africa and directly downlinking the data to an African station, the commercial operator of this satellite may not be concerned to lose precious resources over Europe (where they might have paying customers).

It can be helpful that sensed countries should have the right that the satellite operator allows them (and makes

technical provisions on the satellite system) to receive the data directly from the satellite. Remote sensing satellites should have direct downlink capabilities in order to allow (subject to technology and to costs) reception of the raw data. If not for the very high resolution satellites, this should be considered for the Landsat-class of medium resolution satellites.

Non-discriminatory Access
The first sentence of Principle XII of the United Nations Principles on Remote Sensing of the Earth from Outer Space (Resolution 41/65) states:

As soon as the primary data and the processed data concerning the territory under its jurisdiction are produced, the sensed State shall have access to them on a non-discriminatory basis and on reasonable cost terms.

This principle appears now to be accepted as customary law. A number of interesting issues about access are raised by the principle.

- 'Non-discrimination' provides for a basis or point of departure from which in appropriate cases (the core question is then of course: what would be an 'appropriate' case) deviation would certainly be possible, for example when it would be reasonable from a cost perspective.
- What is '(non-)discrimination'? Discrimination refers to treating equal cases unequally, but what is an equal case? To give a very obvious example: if EUMETSAT treats requests for data from member states fundamentally differently from requests from non-member states this is not considered discrimination because those member states have contributed millions to develop, launch and operate the satellite system. It should by no means be concluded that 'non-discrimination' simply means treating all states equally (apart from the fact that Principle XII predominantly focuses on (non)discrimination of the sensed state).

Conclusions on Benefits and Access to Data
The ISPRS community and the United Nations family can contribute to the issues raised in this paper by the following.

- Pay greater attention to measures of estimating the wealth of nations and the contribution that satellite remote sensing data can play in measuring that wealth.
- Promote the opportunities for bulk buying of remote sensing data followed by controlled distribution.
- Use regional associations, collaborations and groups to develop better means of sharing remote sensing data and expertise, always in the frame of turning data into information and information into knowledge.

The International Council for Science (ICSU)

Review of Scientific Data and Information

By Professor Ray Harris, Department of Geography, University College London, UK,
E-mail: r.harris@geog.ucl.ac.uk

Following a nomination by the Council of ISPRS, Ray Harris has been invited to be a panel member of a Priority Area Assessment (PAA) of Scientific Data and Information set up by the International Council for Science, ICSU. Ray is the chair of the International Policy Advisory Council (IPAC) which reports to the ISPRS Council on policy matters of interest to ISPRS.

The following paragraph, taken from the Priority Area Assessment's context document sets the scene for the importance of data and information in ICSU. The points made by ICSU seem especially relevant to remote sensing and photogrammetry, particularly given the mix of research, operational and commercial organisations involved in these disciplines.

All scientific disciplines are dependent on the production and use of data and the integration of data and information from different disciplines and across national boundaries is central to ICSU's role in supporting international science for the benefit of society. New information technologies offer tremendous opportunities for the improved communication, exploitation, storage and processing of scientific data and information. At the same time new challenges are appearing, relating to the commercial value, accessibility, security, standardisation and validation of scientific data. New mechanisms and models are being developed for the publication and dissemination of scientific information. The field is moving incredibly quickly due to both the 'pull' of new technological developments and the 'push' of science needs. Despite its rapid evolution, technology itself is still a limiting factor in many areas of science and major paradigm shifts are appearing, e.g. the development of the distributed GRID as opposed to the building of even bigger super-computers. Moreover, the necessary institutional structures and legislative frameworks are not always in place to ensure that the optimum benefit can be derived from scientific data and information for the benefit of science and society as a whole. These problems are exacerbated in the least developed countries (or in certain regions of the so called developed countries) where infrastructure and necessary human resources are lacking. The phrase 'digital divide' has been coined to describe this situation at a societal level but there are also expanding 'digital divides' within the interna-

tional science community. The Universality of science, including access to data and information for all scientists is central to ICSU's mission.

With this dynamic context in mind the following terms of reference have been established to guide the work of the PAA.

1. Define an overarching mission and role for ICSU in the area of scientific data and information, taking into account relevant activities outside of ICSU.

2. Propose a strategic framework for ICSU to take this area forward for the next 5-10 years.

3. Examine current activities within the ICSU family, identify gaps, overlaps and synergies of existing activities, and propose responsibilities for individual bodies.

4. Propose modalities for promoting collaboration and co-ordination within the ICSU family when necessary and propose potential partnerships with bodies outside ICSU.

5. Examine and propose, if appropriate, changes either in the future direction of individual bodies or the way they operate including relationships with other bodies/organisations.

6. Consider the ethical issues related to scientific data and information and, where necessary, propose how ICSU might develop policies in response to these issues.

7. Identify policy issues of particular importance to science and society, which should be highlighted in the World Summit on the Information Society.

The panel for the assessment will consist of about a dozen members. The meetings of the assessment panel will start in September 2003, and the review report produced at the end of the process will be published and circulated within the ICSU membership (101 national science bodies and 27 international Unions) and beyond. There will certainly be an opportunity to discuss the report within ISPRS.

Joint ISPRS/WGCV Task Force on Radiometric and Geometric Standards

By Ian Dowman, Secretary General, ISPRS Council 2000 - 2004,
E-mail: idowman@ge.ucl.ac.uk

The idea for a joint ISPRS/WGCV task force originated from a resolution from the CEOS Working group on Calibration and Validation (WGCV) Terrain Mapping Sub Group that a standard format for sensor parameters should be established. A resolution was subsequently passed by the CEOS Plenary:

Noting the disparate way in which Earth observing sensor parameters are specified and quoted, and that the extra terrestrial community adopts a standard format, and

Recognising that proper use, understanding and intercomparison of sensor parameters depends on clear unambiguous definition, WGCV

Recommends that a task force be established with ISPRS to formulate a plan for standardisation of radiometric and geometric parameters of sensors.

WGCV turned this into Draft Terms of reference:

1. Collect and collate lists of parameters used to describe Earth observing sensors.
2. Make an analysis of these and recommend a standard list of parameters for presenting descriptions of EO satellites.
3. Identify ambiguity and confusion within these terms and recommend methods and means of clarifying these issues
4. Prepare a document which sets out standard methods of describing EO sensors
5. Communicate and consult widely with the user community

There was some delay is putting this into action because of the difficulty of finding someone to lead the initiative, however Dr Manfred Schroeder and Professor Stan Morain undertook to arrange a kick-off meeting at the ISPRS Commission II Symposium in Denver in November 2002. At this meeting discussion focused on the scope and content of the task force. It was expected that the output from the Task Force would be a document that defines sensor parameters that can be used by the user community. The goal is to work with colleagues at a technical level to develop a framework and detail to assist CEOS in understanding the calibration/validation needs of the community, and to agree on a standard set of terms. It was hoped that a working document could be presented at the ISPRS Congress in 2004. It was noted that the ISO

19130 Standard for Geographic Information – Sensor and Data Models for Imagery and Gridded Data could serve as a model for the goals of the Task Force. It was also suggested that the standard addressed by JACIE in the USA could be used, and to also look at commercial standards.

The kick-off meeting concluded with representatives of the cal/val team at Stennis Space Center (Bruce Davis, Vicki Zanoni) agreeing to approach NASA management about a possible SSC leadership role. It has subsequently been confirmed that Bruce Davis with chair the task force and that Veljko Jovanovic, Jet Propulsion Laboratory, would be co-chair.

NASA has subsequently agreed to host an International Workshop on Radiometric and Geometric Calibration. This will form a spring board for the Task Force deliberations, and the workshop will include discussion on the work on the Task Force, which will meet immediately after the workshop. The workshop will be held at Gulfport, Mississippi near Stennis Space Center, from 2-5 December 2003. The current plan calls for 2-days of invited technical presentations focusing on state-of-the-art techniques and best practices for calibrating infrared and visible optical sensors, both orbital and sub-orbital. One day will be devoted to tours of Stennis Space Center laboratory and field calibration test sites. On 5 December 2003, the Joint CEOS-WGCV/ISPRS Task Force will follow the workshop with a one-day meeting to discuss recommendations for standardising 'best practices' of radiometric and geometric calibration.

Obituary Gilbert Hobrough

Winner of the 1980 ISPRS Brock Gold Medal Award

Although he lost count after the first couple of dozen, Gilbert Hobrough was the inventor or co-inventor of at least forty seven patents in fields as diverse as phonograph turntables, phonograph pickups, radar altimetry, barometric altimetry, three generations of 3-D machine vision, laser interferometers hi-fi loudspeaker design.

Born in Toronto, Canada in 1918, he dropped out of daytime high school and completed his diploma at night. He studied what interested him by correspondence with the University of London. Fifty years later he admitted that life might have been easier if he had just enrolled in a regular degree program.

Although he called himself an engineer and was fully immersed in all the physical sciences, Mr. Hobrough's interests included a deep appreciation of the arts. In the 1930s, he studied under Group of Seven artist Arthur Lismer, becoming a weekend painter himself 20 years later. His interest in music and radio led to a lifelong interest in hi-fi audio. He was an original "techno nerd" from 1930 onward.

He was a dedicated radio hobbyist through childhood and during World War II he worked for Rogers Radio Tubes first making and then developing radar tubes.

Toward the end of the war he moved to the village of Lucknow, north west of Toronto, to work for an airplane parts company that was converting to civilian production. That's where he worked out his first patent (on a phonograph turntable drive) and opened his own first business – a small foundry and machine shop – in an old mill. He also became the village studio photographer and made the printing plates for pictures in the local newspaper.

He spent a couple of years working on industrial process controls for the production of uranium for Eldorado Mining in Port Hope on Lake Ontario.

Back to Toronto in 1951 he went to work for Photographic Survey Corporation, a Canadian subsidiary of Hunting Surveys Ltd of England. He developed an electronic dodging printer for aerial mapping photos. By some miscalculation, the company let the patent rights slip.

He also developed an airborne profile recorder. This required development of a radar system measuring the distance to the terrain to an accuracy of about a foot. Forty years before GPS satellites, he needed an instrument to measure barometric pressure far more finely than airplane altimeters. His "hypsometer" measured the difference in barometric pressure to one foot of difference in altitude in real time. In essence, it measured the boiling temperature of toluene very accurately.

One day he was watching a roomful of stereo plotter operators working away. Years later, reliable sources

Gilbert Hobrough.

report that he left the room muttering, "There has to be a better way!"
There was and he found it. He developed the first successful "stereo image correlator" for demonstration on a projection plotter in 1957. It made quite a stir and resulted in his receiving the Fairchild Award of the American Society for Photogrammetry in 1960. The technology was embodied for production in the Wild B8 Stereomat built by Raytheon Autometric.
In 1961 Gil moved Los Angeles where he and long partner, George Wood, developed the concept for the ARES machine to correlate high-resolution reconnaissance photos with high precision mapping photos for more precise measurement of changeable conditions on the ground. They sold this project to Itek Corporation, and joined Itek to develop it first in California and then in Massachusetts. At Itek, he patented a method for controlling the shape of telescope mirrors having large diameter but small thickness using a laser interferometer to count interference rings on the mirror and actuators to flex the mirror into the desired shape.
Gil returned to Canada in 1968 to establish Hobrough Limited in Vancouver for developing a very automated orthophoto system using high-speed stereo image correlation. The Gestalt Photo Mapper was successful and upset many long accepted ideas about the "uniquely human capability" of stereopsis.
He left Hobrough Limited in 1972 to co-found, with his son, Ted, several other companies and returned for a while to the development of high quality audio equipment.
Soon he was back at image correlation. He spent a year at the University of Hanover extending his work in a joint venture between Jumetite Laboratories Ltd of Vancouver, Carl Zeiss, and the German space agency. He enjoyed his time at Hanover because it got him "out of the house" and into the company of long time friend Uki Helava and newfound colleague Gottfried Konecny.
In 1980 he was awarded the Brock Gold Medal of the ISPRS at its XIVth Congress in Hamburg. He was cited for his many outstanding accomplishments in developing many advanced automated concepts and instruments for the benefit of the entire photogrammetric community.
From that time until his retirement in 1987, he worked in Vancouver on image correlation for industrial robotics. By then, the field he had been leading for thirty years had a new name – machine vision.
He spent much of his retirement years re-examining how the speed of light varies throughout the Cosmos and how the forces that cause such variations may also be the binding factor at the cosmic and subatomic levels.
One of this profession's more prolific and recognised inventors died of congestive heart failure in Vancouver, Canada on 30 January 2002.

Ted Hobrough (Business and technical partner from 1967 on)

2ND GRSS/ISPRS Joint Workshop on Remote Sensing and Data Fusion over Urban Areas

Berlin, Germany from 22-23 May 2003

By Paolo Gamba, Technical Chair, URBAN2003, E-mail: paolo.gamba@unipv.it

After the huge success of the 1st IEEE/ISPRS Joint Workshop on "Remote Sensing and Data Fusion over Urban Areas (URBAN2001), held in Rome in November 2003, it was straightforward to keep talking about urban remote sensing and proposing a follow-up for that workshop. The importance of such an event comes from the jointly sponsorship by ISPRS (International Society for Photogrammetry and Remote Sensing) and IEEE (Institute of Electrical and Electronic Engineers), through GRSS (Geoscience and Remote Sensing Society). And in May 2003, after a slight change in the long title but with the already familiar nickname of URBAN2003, the second workshop provided us as usual with an overwhelming quantity of good papers, new ideas, contacts and discussions.

The workshop was held in Berlin, Germany, on 22-23rd May 2003, hosted by the Photogrammetry and Cartography Department of the Technical University of Berlin. The site of the conference, close to the Unter den Linden boulevard and the most important places of the recent

Prof. O. Hellwich, URBAN2003 General Chairman, introducing the workshop.

history of the capital city of Germany made us not forget the wide changes that the city of Berlin experienced in the last years, after the break of the Wall and the reunification.

The workshop was dedicated to present recent advances in the topic of urban remote sensing and data fusion issues. In particular, we considered the organisation of special sessions on new sensors, especially very high resolution satellite, and the results of the evaluation of different panchromatic/multi-spectral fusion algorithms for the future French high resolution constellation. Sadly, a third session, a poster session dedicated to the early results of the Envisat satellite for urban remote sensing, was cancelled due to problem in data delivery in the first commissioning phase of this satellite.

The workshop was organised in a two days track, without any parallel session, with two poster sessions allowing an extensive interaction among participants. More than 110 researchers attended it, from more than 20 different countries, traveling to Berlin from all over the world. The submitted abstracts were more than 90. Among them the Technical Committee faced the hard task of choosing the 30 oral papers to be presented in the seven sessions. The total number of papers printed in the conference proceedings (available through the IEEE press service) is 65, for a total of more than 300 pages.
The workshop was scientifically co-sponsored by many scientific institutions: IEEE, ISPRS, the German Society for Photogrammetry and Remote Sensing (DGPF), the European Association of Remote Sensing Laboratories (EARSeL) and the American Society for Photogrammetry and Remote Sensing (ASPRS). Moreover, it was financially sponsored by international institutions, like the European Space Agency (ESA), and industrial companies, whose work or tools are recognised in the urban remote sensing area. We thank therefore Eurimage, PCI Geomatics, Geosystems, FPK, and Pietruska.

One of the most impressive landmarks in Berlin, the Brandebourg Tor.

The outstanding quality of the organising team was clear from the very beginning of URBAN2003.

The final program consisted of one plenary, 7 oral and 2 interactive sessions. The oral sessions were dedicated to

1. New observation capabilities for urban areas
2. Potential of multispectral/hyperspectral data for urban application
3. SAR data in urban areas
4. Building extraction and characterisation
5. Data fusion over urban areas
6. Urban modeling and reconstruction
7. Road network extraction in urban areas

This organisation of the topics reflects the need for urban area characterisation at different scales, and exploiting different sensors. In particular, the workshop showed that there is a remarkable interest in using complex and Interferometric SAR data for different urban applications, from mapping to building extraction to subsidence monitoring. Though all the problems coming from its side-looking nature, radar deserves some more attention for its potentials in this area, especially considering the availability in the near future of high resolution data coming from TerraSAR-X or Cosmo/SkyMed low orbit satellites. This calls also for advanced SAR simulator suited for urban areas, and systematic evaluation of the best geometrical (position, look angle) and electromagnetic (frequency, bandwidth, polarization) configuration for the radar system.

A second, extremely interesting topic is related to the fusion of panchromatic and multispectral data from satellite sensors, with the aim to provide as much as possible "the best of the two world", i.e. high resolution multispectral data. The need for such a tool for urban area characterization is of course very urgent, and current methods are now passing from the theoretical to the implementation stage.

Finally, we have to stress the increasing importance of interpretation techniques well suited for very high resolution data, which means techniques very similar to those

already in use for aerial images, but with the advantages of reduced revisit time (so, better monitoring capabilities) and more bands (better land cover discrimination). Still, it is questionable at this moment if we will able to reduce problems in coregistration and vertical and horizontal accuracy, and this will be one of the open questions in the future, mainly requiring data fusion issues at a feature level for a better overall result.

So far, the future of the workshop seems bright, as well as strong is the support that the scientific community is dedicating to it. The interest for urban remote sensing has been increasing in these years, and this also thanks to the efforts of those that made possible the realization of our workshop. Therefore, thanks should be given not only to our sponsors, but also to our organizing local committee, headed by Hartmut Lehmann, and especially to Marion Dennert. The workshop dinner especially deserves a comment, since it was excellent, but it provided also one more possibility to exchange ideas and experiences for future works.

URBAN2003 was another success, and we think that its legacy should not be lost. We will surely have an event in 2005, since the biennial temporal schedule allows sufficiently quick sampling of new techniques and sensors for urban remote sensing and data fusion, Moreover, as we had in the first workshop, there is a special issue associated with the event. So, please consider the call for the International Journal of Information Fusion on "Fusion of urban remotely sensed features", available on urban2003 web site, at http://tlc.unipv.it/urban_2003/. The deadline is 30th September 2003: you should not miss it.

4th International Symposium Remote Sensing of Urban Areas

Regensburg, Germany from 27-29 June 2003

Reported by Tarek Rashed, San Diego State University, USA

At a time when interest in the use of remote sensing for the study of human settlements is growing overwhelmingly, the 4th international symposium on remote sensing of urban areas (URS2003) comes to prove that what was once thought of as a "narrow" area in the field of remote sensing is not longer so. More than 120 urban remote sensing researchers and practitioners, representing 36 different countries, convened June 27-29, 2003, in Regensburg, Germany, to take advantage of three days of intensive program that included oral and poster paper presentations, commercial product updates, and social events that provided numerous opportunities to network and exchange ideas with other research partners and colleagues. The beautiful city of Regensburg with its medieval centre and modern suburbs provided an attractive setting for the symposium and a reminder of the insights that remote sensing can add to our understanding of urban systems, when the use of technology is augmented by a through understanding of urban form and function, as well as the spatial context within which urban systems develop.

The URS2003 was hosted by the Geography Department at the University of Regensburg and was scientifically co-sponsored by many scientific institutions, including: the International Society for Photogrammetry and Remote Sensing (ISPRS), the European Association of Remote Sensing Laboratories (EARSeL), the German Society for Photogrammetry, Remote Sensing and Geoinformation (DGPF), the University of Regensburg, and the Istanbul Technical University. In addition, several scientific publishers and industrial companies whose journals or tools are recognised in the urban remote sensing arena have sponsored the symposium.

The launch of the new generation of very high resolution imagery and the wide dissemination of a variety of digital data sources that can be used to augment detailed satellite data have brought together an interesting and exciting period in the development of urban remote sensing. This

John Trinder opened the symposium.

has been expressed by increasing published articles and books on urban remote sensing, new urban specialty groups within many national and international remote sensing societies and a growing number of workshops organised around topics that relate in a way or another to the broader field of urban remote sensing. While this trend is indeed very encouraging to the future of the field, there is also a vital need for those involved in these activities to build ties among themselves to foster progress toward a common agenda. Therefore, the success of the URS2003 in this regard was spectacular due to its focus on building relationships between different researchers and practitioners toward a unified research agenda for the international community of urban remote sensing. This was evidenced by the symposium's final program that reflected the different perspectives on the way remote sensing is currently applied to tackle urban problems and various ideas on the future trends within the field. These perspectives and ideas were covered in 10 oral sessions and an interactive poster session, organized sequentially thus allowing an extensive interaction among participants. In addition, the two-day exhibition provided a unique opportunity for participants to update their knowledge with the stat-of-the-art in the technology.

The oral sessions were dedicated to the following topics:

1. Ecological Aspects/Landscape metrics
2. Urban Information and Decision Support Systems
3. Change Detection Analysis
4. Road Extraction Techniques/Traffic Applications
5. Radar and Thermal Applications
6. Special Applications
7. Extraction of Height and Density
8. Monitoring Urban Land Cover Dynamics and Urban Growth
9. Vulnerability to Urban Areas to Natural Hazards
10. New Information Extraction Strategies

The organisation of these sessions, as implied by their topic titles, reflected a balance that the organisers of the symposium have sought between techniques/data driven approaches to urban applications, and thematic/theory driven ones. This balance between applied and academic realms is indeed a very important issue to be considered in the wider agenda of the urban remote sensing community. Oral papers and poster presentations are included in the proceedings of the symposium, available through the international archives of the ISPRS, Volume No. XXXIV-7/W9 under the following title:

Proceedings of the ISPRS WG VII/4 Symposium
Remote Sensing of Urban Areas
June 27-29, 2003
Regensburg, Germany
Editor, Carsten Jurgens

The URS2003 symposium was another success added to a series of conferences devoted to remote sensing of urban areas. Thanks are due to Carsten Jurgens, his students, and all who helped with the organisation of the symposium, those who sponsored the symposium, and those who participated and presented their work. While there is a follow-up session on this symposium planned to take place next year during the ISPRS Congressional meeting in Istanbul (August 2004), the 5th international symposium will likely take place in 2005 in the United States.

Joint Workshop of ISPRS Working Groups I/1 and II/2

'Three Dimensional Mapping from InSAR and LIDAR'

Portland, Oregon, USA from 17-19 June 2003

By Mike Renslow, Chair, WG I/3 (Vice-President, Spencer B. Gross, Inc.), E-mail: mike@sbgmaps.com and Dr. Bryan Mercer, Chair, WG II/2 (Chief Scientist, Intermap Technologies Corp.)

This Joint Working Group Workshop was held in Portland, OR, USA at the Doubletree Hotel along the beautiful Columbia River. The meeting had 60 attendees with representation from the USA, Canada, UK, Italy, and Germany. During the 2-1/2 days, 31 papers were presented covering a wide range of LIDAR/InSAR topics on instrumentation, calibration, data processing, specialised algorithm for feature extraction, and development of GIS databases. The Workshop afforded an opportunity for 6 student volunteers to provide support and participate in this international event.

The Keynote address was delivered by Professor Ian Dowman of University College, London, UK and ISPRS Secretary General. His presentation was titled "The Role of LIDAR and InSAR in Populating Geospatial Databases", and he set the tone for the next two days with a through overview of the technologies and his vision of the future. It is clear that active sensor technologies have become a valuable source for data acquisition and surface model development that are a natural match to the demands of GIS and the types of analysis and modelling required to support complex geo-spatial research and applications.

Enjoying lunch in the tent.

The technical program focused on the following tracks supported by three of four presentations:

- Technology Trends
- LIDAR Performance
- Combining/Contrasting LIDAR and InSAR Data
- Spaceborne LIDAR and InSAR
- Feature Extraction
- Specialised Applications
- Forestry Applications

A CD of the conference papers, abstracts, slides, and images is being assembled for distribution to the attendees. Details may be found at the Workshop web site: http://www.intermaptechnologies.com/isprs_wgii_2/

The workshop attendees enjoyed the delightful venue along the Columbia River. Between sessions the luncheons were served on the Riverside Dock on the River. A special tent was erected in the event of wet weather.

Professor Ian Dowman.

On the first evening an Icebreaker Reception was held, and on the second evening, the Workshop Banquet attendees were entertained by a jazz trio. These activities provided ample time to exchange ideas and meet new colleagues.

The Workshop ended with a Slide Show highlighting the two days of activities and concluding remarks from Ian Dowman.

The Workshop Organisers give special thanks to the Sponsors: Optech, Inc., Applanix Corp., Spencer B. Gross, Inc., Intermap Technologies, Inc., and ASPRS-Columbia River Region.

Workshop of Commission V – WG 4

'Vision Techniques for Digital Architectural and Archaeological Archives'

Ancona-Portonovo, Italy from 1-3 July 2003

By Gabriele Fangi, E-mail: fangi@univpm.it

From 1rst to 3rd of July in Ancona-Portonovo, Italy, took place an international workshop ISPRS on the survey and archiving of Cultural Heritage. The title of the workshop was "Vision Techniques for Digital Architectural and Archaeological Archives". 89 were the participants, coming from 12 different countries. Particularly crowded the Japanese group, 12 participants, leaded by Prof. Hirofumi Chikatzu of Tokyo, chairman of the WG 4 of Commission V "Image Analysis and Spatial Information System for Application in Cultural Heritage. Commission V deals with close-range photogrammetry and WG 4 in particular of Cultural Heritage. The keynote address has been given by Prof. Petros Patias, president both of the Commission V and of CIPA, the international committee dealing with the documentation of Cultural Heritage. Also Prof. Dequal, from Politecnico of Turin, director of Cipa Congress in 2005, and Mark Pollefeys, chairman of the inter-commission III-V, attended the workshop.

The workshop was dedicated to recent advances in the topics of cultural heritage survey. In these last years, recent innovations regarded the survey, modelling, visualisation and archiving of Cultural Heritage. The photogrammetric systems are deeply renewed, converted from the analogue and analytical photogrammetry to digital photogrammetry. For instance, now many automatic operations are possible like the automatic feature extraction, image correlation, formation of Digital Models Surfaces and terrain, and real-time photogrammetry.

In order to satisfy the increasing demand of applications, the WG V/4 begun a co-operation with other working groups, such as those derived from Computer Vision, Internet Technology and of the VR, Virtual Reality. Moreover the introduction of the Laser scanning for architecture is more and more a revolutionary instrument. Particularly numerous and interesting the presented works in this activity.

The opening of the workshop. Prof. Chikatzu greets the participants, Prof. Fangi and Patias are on the table.

During the social dinner.

The site of the conference is inside a natural park, a protected area, in the so-called Riviera del Conero, a magnificent environment, close to the Adriatic sea. We discussed about these themes, in a useful exchange of experiences. 66 works have been presented, published in the workshop proceedings, for more than 300 pages, and a CD. Italy obviously has been always very rich of researchers and experiences. The participants were not only by experts of the sector but also by final users, for a meeting that has

Some participants during the social trip to Urbino. Are recognisable Chikatzu, standing of the right, Patias, with sunglasses, Fangi, in front.

been truly interesting. In nine sessions 38 oral presentations in seven sessions:

1. Developments and integration of close-range vision techniques
2. Low-cost and rapid photogrammetric systems
3. Scene modelling by laser scanning
4. Algorithms and process in digital image analysis
5. Technologies for VR/VE and animation for internet connection
6. Developments of spatial information systems for recording structures and items of cultural heritage
7. Integrated applications in cultural heritage
8. Multi-image and multi-sensor systems
9. Laser scanning data processing.

The social trip to Urbin concluded the successful manifestation.

Report of the International Workshop on 'Global Environmental Databases: Adaptation to Meet Current and Future Needs'

United Nations Conference Centre, Bangkok, Thailand, 4-6 June 2003

By Ryutaro Tateishi, Chairman, ISPRS WG IV/8, E-mail: tateishi@faculty.chiba-u.jp and David Hastings, E-mail: hastingsd@un.org

The workshop on "Global Environmental Databases: Adaptation to Meet Current and Future Needs" was held on 4-6 June 2003 at the United Nations Conference Centre, Bangkok, Thailand. The meeting was organised by ISPRS WG IV/8 on global environmental databases, with co-organiser United Nations Economic and Social Commission for Asia and the Pacific (UN/ESCAP). Sixteen scientists participated, from the six countries of Thailand, USA, Japan, Italy, Kenya, and Nepal. Participants enjoyed a dinner on the first day at the Royal Princess Hotel, and on the second day at Thewes Pier on the Chao Phraya River, with a colourful sunset and evening view of the river. On the last day of the meeting, the group paid a technical visit to the Geo-Informatics and Space Technology Development Agency (GISTDA). A presentation and tour showed that GISTDA is an active satellite/geospatial data and information development and distribution centre.

The background of the workshop is the efforts of the former ISPRS WG IV/6 (1996-2000) and the present WG IV/8 (2000-2004) by which two books were published; "Global Environmental Databases" Volumes 1 and 2 (available from GITC http://www2.profsurv.com/isprsarc.html). Based on a workshop at the East-West Center in Honolulu, in November 1999, these books extensively discuss the present situation of global environmental databases such as topography, oceanography, land cover, biodiversity, soil, hydrology, climate, livestock, land use, and biophysical data. Problems hindering their optimal development and use, and suggested directions for moving toward such optimisation are discussed. Common challenges were found to be 1) frequent glitches in [or lack of long-term] commitment and funding, 2) national-global and local-global issues (such as differing local/national views/priorities/abilities/approaches that result in differing legend categories), 3) differences in objectives of producers and users, as well as differences in goals of funding agencies from those actually implemented by database developers under contract to such funding agencies, 4) other issues of standardisation/ harmonisation, 5) validation and ground truth/reference data, 6) data access, 7) the competitive bidding process which often creates a win-lose situation for funders, data developers and users, and 8) cultural bias of datasets developed by a small subset of global scientific thought.

Based on this background, WG IV/8 planned to have this workshop to discuss action plans for the next 4-5 years for better development and usage of global environmental databases to meet current and future needs. Considering the concerns of the Regional Space Applications Programme for Sustainable Development in Asia and the Pacific (RESAP), supported by UN ESCAP, for improved operational effectiveness, accessibility, and use of geomatics data for such activities as planning, food security, and disaster management, co-operative organisation of this workshop was appropriate.

Major focal points of the workshop were (1) how to make global/regional/local environmental data(bases) more useful to operational projects, and (2) what strategies for adapting global environmental data(bases) will help them to better meet current and future needs?

Factors discussed at the workshop include: (1) Convenience (Data should be easy to use, with convenient formats and viewers; and with access that is simple and convenient for the user [which means extra work by producers to harmonise presentation approaches around user-oriented models, making data easy for non-space specialists to select and use]; perhaps delivered via a portal developed in response to widespread interests for convenient data access); (2) Documentation (With non-specialist user-oriented [not producer-oriented as is often the case at present], non-superfluous, easy-to-read for people who are reading the documentation in

their second language [e.g. low Fogg index, etc.]; convenient, searchable metadata written for the non-specialist user; (3) Case Studies (Describe representative case studies using methodology which is simple enough for non-scientific users, but good enough for acceptable quality outputs); (4) User Interaction ("When a data or instrument provider asks 'what's next' the answer comes from the users" is an approach that helps to avoid systems designed for the data producers; improved user feedback mechanisms using the Web and other media ["Why isn't this working well enough?"]; how to get more data brokers and intermediate service providers active in supporting enriched user communities?; How to get data producers to come down from their spacecraft to reach out to non-specialist decision-makers?); (5) Integration (Better thematic and geographic integration [including keeping marine and land data on their respective sides of the coast line/zone], tweaking products for specific user communities [and sometimes adapting legend categories for better (a) universality plus (b) reclassificability for specific user communities], better selection of format and projection [before settling on the Goodes Projection again, see if it's used as a native projection in any GIS, whether compressed Goodes-projected data are efficient, and whether Goodes-projected data can be conveniently reprojected into any other projection using software that currently commonly transforms data through latitude-longitude coordinates]; (6) Products (Don't forget to aim low with some products – many data providers' lowest-common-denominator products sell best; provide ready-made while also letting high-end users select data and post processing options to customise products; develop low-cost sustainable alternatives to ultimate and expensive data to increase markets; extend niche products to broader geographic areas – examples might include fire and famine monitoring products; (7) Public Relations [Visibility, Motivation to use] (How to get users to WANT to use the data, learn what's available from what sources, acquire data/products, and use them wisely?)

In the afternoon of the first day, the International Steering Committee for Global Mapping (ISCGM) WG4 session on global land cover data was held. In this session, the trend of global land cover mapping was summarised, and a new plan by US Geological Survey/EROS Data Center was presented by Chandra Giri. A new plan for the ISCGM Global Mapping Project was presented by Ryutaro Tateishi. The importance of exchanging land cover ground truth (or reference) data and making them open by the co-operation between projects was emphasised.

On the second day, "Using Remote Sensing for Conservation: Increasing Access" and "ASTER: Instrument, Data, and Applications" was presented by Gary Geller. Participants held an extensive and fruitful discussion on how to promote operational use of remote sensing for management of conservation areas.

In summary, the workshop had an intensive discussion on how to promote operational use of global environmental data. The conclusion was that this depended on improved user interaction aimed at a more user-oriented focus of space agencies, data developers and data service providers; better data integration and products; better documentation/metadata, better access to better case studies; and overall better public relations. In short, space agencies and data service providers need to look less like government bureaucracies, and more like the best 21st century entrepreneurs. Perhaps we should see more geomatics products advertised in PC Week and The Economist, and hope that major PC software houses incorporate geomatics software into their office suites. (When will Open Office, GRASS, and MapServer develop interfaces? When will Microsoft MapPoint enrich its functionality and open its data architecture, say by allowing the importation of multiple SDTS, GEOTiff and Shape Files for multi-layer manipulation of global and international data, to help put geomatics into every home and office?)

The WG IV/8 will continue to contribute to promote the better development and usage of global environmental databases.

Call for Papers - NG2I 2003

ISPRS WG IV/5 Workshop on Next Generation Geospatial Information in Cambridge (Boston), Massachusetts, USA from 19-21 October 2003

By Prof. Peggy Agouris, Dept. of Spatial Information and Science & Engineering, National Center for Geographic Information & Analysis, University of Maine,
E-mail: peggy@spatial.maine.edu

Scope

The proliferation of data collection tools, from satellite sensors and GPS receivers to camera-equipped mobile phones, and the resulting availability of huge amounts of geospatial data, together with heightened consumer expectations (e.g. reliable car navigation systems) and recent unforeseen geopolitical events, have created a rapidly increasing demand and need for timely and accurate geospatial information.

The scope of this intensive workshop is to address research advancements in Digital Image Processing & Analysis, Geographic Information Systems, and SpatioTemporal Databases that are relevant to geospatial information. Its main objective is to bring together specialists from these overlapping but not necessarily interacting scientific communities and provide a high-quality forum for the presentation and discussion of related research activities.

The workshop is sponsored by the U.S. National Science Foundation, and in particular the Information and Data Management Program of the Computer and Information Science & Engineering Directorate. It is organized by Working Group IV/5 (Image-Based Geospatial Databases) of the International Society for Photogrammetry and Remote Sensing (ISPRS). NG2I 2003 follows a successful first event on "Integrated Spatial Databases: Digital Images & GIS" that was organised in 1999 in Portland, Maine.

Suggested Topics

High quality, original contributions are solicited. Topics of interest for potential paper submissions include (but are not limited to) the following:

- Automated methods of geospatial information extraction and change detection using digital imagery;
- Image sequence analysis and video processing for dynamic events;
- Spatiotemporal knowledge management;
- Distributed computing for geospatial applications;
- Semantic and geometric integration of heterogeneous spatial information and sources;
- Spatial and spatiotemporal data mining, queries, and content-based information retrieval methods;
- Digital libraries and web-based geospatial environments;
- Mobile computing and location-based services;
- Handling data quality and uncertainty in geospatial information, incl. modelling, propagation, visualisation, and communication.

Organisation

Workshop Chair: Peggy Agouris, University of Maine, USA

Programme Committee:

- Chaitan Baru, University of California - San Diego, USA
- Isabel Cruz, The University of Illinois at Chicago, USA
- Mike Goodchild, University of California - Santa Barbara, USA
- Armin Gruen, Swiss Federal Institute of Technology, Switzerland
- Thanassis Hadzilacos, Computer Technology Institute, Greece
- Christian Heipke, University of Hanover, Germany
- Marinos Kavouras, National Technical University of Athens, Greece
- Martien Molenaar, ITC, The Netherlands
- Dimitris Papadias, Hong Kong University of Science and Technology, China
- Hanan Samet, University of Maryland, College Park, USA
- Timos Sellis, National Technical University of Athens, Greece
- Monika Sester, University of Hanover, Germany
- Anthony Stefanidis, University of Maine, USA
- Vassilis Tsotras, University of California - Riverside, USA
- Marc van Kreveld, Utrecht University, The Netherlands
- Mike Worboys, University of Maine, USA

Workshop Venue

The workshop will be held at the innovative "Hotel@MIT", a high-tech hotel of the Hilton Group, which, in addition to award-winning architecture and cosmopolitan amenities, offers free high-speed Internet access in all rooms. The "Hotel@MIT" is located in the heart of Cambridge, Massachusetts. Cambridge, often referred to as "Boston's Left bank", is the academically and culturally rich and active side of Boston, and home to the renowned educational institutions MIT and Harvard. For more details on the "Hotel@MIT" please visit its Web site at http://www.hotelatmit.com/ and for information on Cambridge please visit http://www.cambridge-usa.org/.

A limited number of deluxe rooms have been reserved for the workshop at the special rate of $159 per night (plus applicable taxes). The cut-off date for reservations at this special rate is September 19, 2003. Reservations can be made by contacting the hotel directly at +(617) 577 0200, or by e-mail: reservations@hotelatmit.com. Be sure to mention "Next Generation Geospatial Information" to obtain the special workshop rate. Early hotel reservations are *strongly* encouraged, as the limited number of rooms that have been reserved for NG2I 2003 participants will be dispersed on a "first-come, first-served" basis, and the hotel may run out of rooms at the special workshop rate before the cut-off date.

Mid-October is an excellent time for visiting the Boston metropolitan area and New England in general. The weather is mild, breezy, yet still warm, and foliage colours are starting to change, adding a spectacular touch to the beautiful New England scenery.

Information for Prospective Authors

The reviewing process for this workshop will be performed in two stages. First, 3-page extended abstracts will be reviewed by the program committee for the selection of workshop presentations. Subsequently, the authors who are selected to present during the workshop will be invited to submit full papers to be reviewed for inclusion in the workshop proceedings, which will be published as a book after the completion of the workshop.

Important Dates

- Submission of extended abstracts: August 4, 2003
- Notification of abstract acceptance: September 1, 2003

- Submission of full papers: October 6, 2003
- Notification of paper acceptance: November 3, 2003
- Camera-ready papers for post-workshop book: December 1, 2003

Submission Format
All submissions should be in Acrobat PDF format. Extended abstracts should not exceed 3 pages, 11-point font, one-inch margins all around. Full papers should be limited to 10 pages, 11-point font, with one-inch margins all around.

Submission Procedure
All submissions must be e-mailed to: submissions NG2I@spatial.maine.edu. Please make sure to observe the above mentioned deadlines.

Questions & Further Information
For any questions or to request additional information please send e-mail to: questionsNG2I@spatial.maine.edu. For registration, and up-to-date details on all aspects of the workshop please check its Web-site regularly at http://dipa.spatial.maine.edu/NG2I03/

ISPRS Workshop

WG II/5, II/6, IV/1 and IV/2 Joint Workshop on "Spatial, Temporal and Multi-Dimensional Data Modelling and Analysis"

Québec, Canada from 2-3 October 2003

Invitation
You are cordially invited to participate in the Joint Workshop of ISPRS Commission II and IV, Working Groups II/5, II/6, IV/1 and IV/2. Originally focused on spatio-temporal data modelling issues, this workshop has been extended to include dynamic and multi-dimensional GIS issues as the workshop has been merged with the DMGIS workshop[1] that had to be cancelled. The objective of this workshop is to provide a platform for scholars and professionals in the areas of spatio-temporal and multi-dimensional data modelling and analysis to exchange research ideas and interests, to present their newest research results in theses areas, to define important areas of application for this technology, and to promote international collaboration in these fields.

Organisers
The Workshop is organised as a collaboration of four ISPRS Working Groups, spanning two ISPRS Commissions:
- ISPRS WG II/5: Design and operation of spatial decision support systems
- ISPRS WG II/6: Spatial analysis and visualisation systems
- ISPRS WG IV/1: Spatial and temporal data modelling and analysis
- ISPRS WG IV/2: Federated databases and interoperability

Venue
The workshop will be held at the Hotel Plaza Québec close to historical Old Québec, which was declared a UNESCO World Heritage site in 1985. At this period of the year, the Fall colours of our forests are at their peak.

Workshop Topics (in the context of data modelling and analysis)
- Spatio-temporal relations and reasoning
- Multi-dimensional and multi-scale modelling
- Three-dimensional GIS modelling
- (Heterogeneous) spatio-temporal database design and development
- Spatial database revision
- Multi-source data fusion
- Spatio-temporal data mining
- Multi-scale and multi-media representation
- Multi-dimensional decision support systems
- Other related topics

Format
The workshop will consist of sequential technical sessions, being moderated, with 20 minutes allocated to each presented paper. There will be space for about 24 papers.

Important Dates
- Deadline for short papers: August 25 2003
- Notification of acceptance: September 8, 2003
- Workshop program: September 15, 2003
- Workshop: October, 2-3, 2003

Guidelines for Paper Submission
Short papers are expected to be about 6 to 8 pages in PDF format and must be sent via e-mail to:
eveline.bernier@scg.ulaval.ca

Publication
Proceedings will be published according to the format of the ISPRS archives, and will be included in the registration package as a CD-ROM. We also intend to execute a further selection of accepted extended abstracts to take place. The authors of the selected abstracts will be invited to submit a full paper for publication in a special issue of an International Journal (probably the Journal of Applied earth observation and Geoinformation – JAG), requiring a further review process for that journal.

Registration Information
The registration fee is 150$ CAD and includes access to the sessions, proceedings of the workshop, coffee breaks and two (2) lunches. The fees can be paid by credit card (Visa and MasterCard) or by cheque (payable to "Université Laval"). Payment must be made in Canadian dollars. Please use the Registration form.

Committees
Organising Committee
- Yvan Bédard CRG, Laval University
- Eveline Bernier CRG, Laval University
- Rolf de By (Co-Chair, WG IV/2) ITC, Enschede, The Netherlands
- Wolfgang Kainz (Chair, WG II/5) University of Vienna, Austria
- Zhilin Li (Chair, WG II/6) H.K. Polytechnic University, Hong Kong, China
- Wenzhong (John) Shi (Chair, WG IV/1) H.K. Polytechnic University, Hong Kong, China

Local Organising Committee
- Yvan Bédard CRG, Laval University
- Eveline Bernier CRG, Laval University

Information and inquiries
For more information, please visit: http://sirs.scg.ulaval.ca/isprs_wg4-1/workshop.asp
Or contact Ms. Eveline Bernier at:
Centre for Research in Geomatics Pavillon Louis-Jacques-Casault
Université Laval
Québec (Québec)
G1K 7P4 Canada
Phone: 1 418 656 5355
Fax: 1 418 656 3607
E-mail : eveline.bernier@scg.ulaval.ca

Note
[1] The 4 th ISPRS Workshop on Dynamic and Multi-Dimensional GIS was supposed to be held in Enschede, The Netherlands, in August 2003.

ISPRS Working Group VII/6

By Yoshifumi Yasuoka, Chairman ISPRS Working Group VII/6

Dear international colleagues,

As you may know by now, the ISPRS Working Group VII/6 and Japan Society of Photogrammetry and Remote Sensing are going to organise the international workshop on Monitoring and Modelling of Global Environmental Change at Kyoto International Community House, Kyoto, Japan on 21-22 October, 2003.
This is to remind you that deadline for the abstracts is 20 July 2003.
If you are planning to submit a paper to the workshop please do not forget about the abstract submission. The details about the workshop is written on the homepage of the workshop: http://jsprs.iis.u-tokyo.ac.jp/jsprs/isprs/top.html

The ADEOS-2 satellite was successfully launched on 14 December 2002 by NASDA from the Tanegashima Space Center, Japan. The workshop would be a good opportunity for exchanging information on the latest outcome of various remote sensing activities including the ADEOS-2 Program.

Moreover, this year is the 15 years anniversary of the exciting ISPRS Congress held in Kyoto in 1988. Autumn is the best sightseeing season in Kyoto. We look forward to seeing you in the beautiful city of Kyoto in coming October.

Best regards,

Yoshifumi Yasuoka
Chairman
ISPRS Working Group VII/6
Institute of Industrial Science
University of Tokyo
4-6-1 Komaba, Meguro, Tokyo
Japan
Tel. +81-3-5452-6409 (or 6411)
Fax. +81-3-5452-6408
yyasuoka@iis.u-tokyo.ac.jp

The Brazilian Amazon Forest Monitoring by Satellite

The Forest Degradation Cartography Using Image Processing and Classification Techniques

By João Roberto dos Santos, National Institute for Space Research – INPE, Ministry of Science and Technology – MCT, São José dos Campos, São Paulo State, Brazil, E-mail: jroberto@ltid.inpe.br

One of the Brazilian Government requirements to take decisions for an effective monitoring and control of its ecosystems as well as the planning of the sustainable use of its natural resources is to get updated information about land cover.
It allows to know the description, location of the main characteristics of a landscape and information related to the human settlement of the interest area.

INPE/MCT has been working on thematic cartography of deforested areas in the Amazon region (~5 million km^2) in order to make this information available to the public. It makes possible to know about the extension and the estimate of the annual deforestation rate. All this information is available in the database at http://www.obt.inpe. br/prodes/. This work is very important for scientists that analyses causes and effects of human settlement through investigation models in issues like: biodiversity, global changes, dynamics of agriculture/cattle raising frontier, among other aspects of interest for the population.
In this frame, the community of researchers and technicians involved in the Program "Environmental Monitoring of the Amazon Region" is performing a methodological breakthrough to characterise and estimate the extent and rate of gross deforestation in the Amazon. In addition, using new procedures to accomplish this large task and computer techniques for the interpretation of TM-Landsat digital images and, preparing the so-called PRODES Digital Project. The procedure for the deforestation analysis of the TM-Landsat data takes into account the following steps:

a) the generation of synthetic images technique through a linear spectral mixture model whose aims is to estimate the proportion of the Soil, Vegetation and Shade

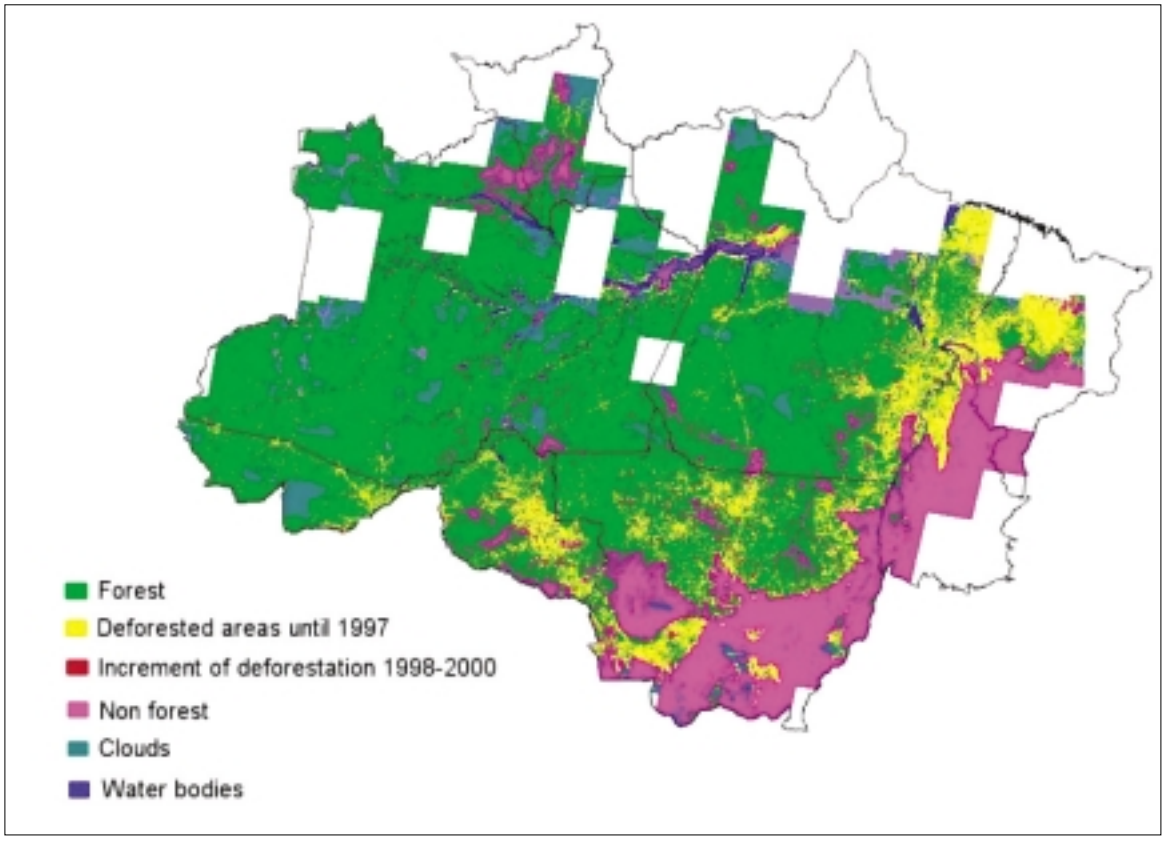

Figure 1, Spatial representation of deforested areas in Brazilian Amazon obtained by digital processing of TM/Landsat images. Source: (http://www.obt.inpe.br/ prodes/).

Figure 2, Section of ASTER/ Terra image (colour composite, 2R3G1B) in recent selective timber logging areas.

components for each pixel from the spectral response in different bands;

b) due to the complexity of landscapes and/or land use, the segmentation technique for the region growth, defined by similarity thresholds and the area established previously is used only for those regions which are spatially adjacent and have similar spectral characteristics that can be grouped. Also, this technique of grouping data has been applied only for the fraction images "shade" or "soil", considered as ideal for studies in the Amazon.

c) the non-supervised classification technique for assembly data (ISOSEG) that is used for the class discrimination based on statistical attributes of the region, within pre-defined acceptance thresholds above 90%;

d) a complementary procedure of editing and auditing, made by and experienced photointerpreter. Once the edition is made, each thematic image chart (theme chart) is placed in a specific database according to its orbits/points of reference from the satellite, to compose the mosaic of the "Brazilian Amazonia" (composed by 229 TM scenes). Due to the large amount of information generated in the original scale of the work, during this mosaic composition process, the Information Plans (IP) of data input, namely the theme charts, have their spatial resolution transformed to 120 meters, for a final presentation of the entire Brazilian Amazon at 1:250.000 scale (Figure 1). As for each Brazilian State mosaic that composes the Brazilian Amazonia, the IPs of the theme charts have a resolution of 60 meters, the scale of presentation is 1:500.000. The PRODES Digital Project has been done through the SPRING computational system (SPRING is under public domain). It can be downloaded at http://www.dpi.inpe.br. And it was conceived to process satellite images and to integrate data from both thematic and basic cartography.

The use of digital processing techniques, such as they are used in this project, minimises problems like geometric distortions and the consequent failure of cartographic adjustment of polygons with annual deforested areas. This occurred very often when the work methodology was visual interpretation of images in photographic format (colour composites at 1:250.000 scale, with the identification of minimum deforested sections of 6.25 ha).
This procedure allowed a higher precision in geo-referencing of deforestation polygons which compose a multi-temporal information base.

All these comments and summarised information show the capacity of the PRODES Digital Project to manage a time series of data/information and contribute strongly

for the process of annual monitoring of the amazon Forest, exclusively to targets of deforestation.

The spatial representation of this type of forest degradation, besides the values of extension and deforestation gross rate, is a very important subsidy because indicates the size and the direction taken by land occupation, performing an adequate territorial planning based on sustainable development.

The discussions raised by representatives of public and private organisations (NGOs) from this database, produced recently a Decree by the Brazilian Government (on 3 July 2003 from the Brazilian President, according to the Article 84, item VI, point "a" of the Constitution) creating the Ministerial Permanent Working Group whose aims is to propose actions to reduce deforestation indices in the Brazilian Amazon, using resources such as: cadaster of lands in those municipalities which make up the so-called "Deforestation Arch"(the region designation with the highest deforestation rates in the Amazon), fiscal incentives to increase the economic efficiency and sustainability of deforested areas, generation of jobs and income about activities related to the recovery of deforested areas, incorporation in the production process of deforested and abandoned areas, management of forested areas and so on.

The Brazilian scientific community has been strongly advancing on its research and spatial applications related to the forest studies, here referred to both monitoring forest clear cut and the detection and monitoring of burning and timber exploration (Figure 2) in the Amazon.
Studies made with sensors images from CBERS, MODIS, ASTER (using among others, the Change Vector Analysis technique and/or information extraction based on Fuzzy Artificial Neural network) have been an important data source for the analysis of environmental degradation of these large tropical forest area. In some cases, it is also used high resolution satellite data (IKONOS) and airborne and spaceborne radar.

CBERS Image

This CBERS image is used in an educational program in Porto Alegre, Rio Grande do Sul, South Region in Brazil. This image is from October 2001, from CCD sensor in CBERS.
In the right side you can see part of Patos Lagoon, in the top of lagoon you can see the Guaiba river and just beside the river is the Porto Alegre metropolitan area.