

XVIII ISPRS Congress, Vienna, Austria, 9-19 July 1996

Spatial Information from Images

Alias Abdul Rahman

Panel of GIS and Cartography

Approximately 2000 participants from more than 80 countries attended the congress. It was held in Austria Congress Center, Vienna. The events were categorised into various sessions, namely, 95 Scientific-Technical sessions, 36 Poster sessions, 10 Tutorials, 100 Exhibitors (Commercial, National, and Scientific Exhibition), 20 Exhibitors Showcase sessions, 10 Technical Tours, 8 items for Social Programme plus 20 items for Accompanying Persons.

Tutorials

Ten tutorials were offered before the official opening of the congress and attended by approximately 300 participants. These tutorials were delivered in two days, and the registered participants has to select the most relevant ones (with payment). The ten tutorials were *Integration and Orientation of Sensor Systems*, lectured by K. Novak from Transmap, Ohio, and I. Colomina from Barcelona. The second tutorial: *Computer Vision in Photogrammetry and Remote Sensing: Towards Automatic Mapping*, lectured by W. Schneider from Inst. for Surveying and Remote Sensing, University of Agriculture, Vienna, and A. Pinz from Inst. for Computer Graphics, Technical University fo Graz, Austria. The third tutorial: *Technologies for Handling Very Large Volumes of Spatial Data*, lectured by E.J Otoo from Center for Distributed and Parallel Computing, Ottawa, Canada.

Then the fourth: *3D Image Metrology Systems and Applications*, lectured by H. Beyer from Imetric Co., Virginia, USA and E. Baltsavias from Inst. of Geodesy and Photogrammetry, ETH Zurich. The fifth tutorial: *Advanced DTM Technology*, lectured by L. Molnar, R. Ecker, D. Heitzinger, F. Hochstoger, H. Kager, N. Pfeifer, J. Wintner from Inst. for Photogrammetry and Remote Sensing, University of Technology, Vienna. The sixth: *Digital Photogrammetry in Small Scale Imagery*, lectured by D. Frisch, N. Haala, M. Hahn, M. Sester from Inst. of Photogrammetry, University of Stuttgart, Germany. The seventh tutorial: *Digital Orthophotos Applied for Topographic Mapping*, lectured by M. Franzen, G. Kohlhofer from Federal Office of Metrology and Surveying, Vienna. The eighth tutorial: *Image Quality*, lectured by H. Zeimann from Dessau, Germany, B. Andren, from Stockholm, Sweden, and A. Boberg from Royal Institute of Technology, Sweden. The ninth: *Projective Geometry for Geometric Image Analysis*, lectured by R. Mohr, from Grenoble, France. The last (10th.) tutorial: *Conceptual Aspects of GIS Technology*, lectured by M. Molenaar from Center for Geoinformation and Image Processing, Wageningen Agricultural University, Holland, D. Fritsch from Institute for Photogrammetry, University of Stuttgart, Germany, and by R. Bill from Institute of Geodesy and Geoinformatics, Rostock University, Germany. The author only managed to attend and paid for two tutorials, they were the "Advanced DTM Technology" (one-full day), and the "Conceptual Aspects of GIS Technology" (another one-full day). In the **Advanced DTM Technology**, the following topics were discussed:

- Interpolation and spatial representation of DTMs: data structures, interpolation methods, surface modelling, algorithm tiling, 3D enclaves.
- DTM applications: surface exploration (hill shading, etc), DTM algebra, digital orthophotos properly representing 3D objects, monoplotted, etc.
- Integration of DTMs in other systems.
- Topographic data management: DTM oriented archiving and information systems,

A prototype software for a nation-wide DTM data archiving was demonstrated at this tutorial. This software was developed at the Institute for Photogrammetry and Remote Sensing, Technical University of Vienna. The other attended tutorial, the "Conceptual Aspects of GIS Technology" discussed three major subtopics, namely,

Spatial Data Modelling for Geoinformation Systems by Prof. M. Molenaar. He discussed the following topics:

- Introduction: Fields, Objects and Geometry,
- Levels for Data Modelling,
- Fields and Rasters,
- The Geometry of Spatial Objects,
- Example of a Vectored Structured Data Model, and
- Object Hierarchies.

The Integration of Spatial Object Models and DTM, 2.5D and 3D Models by Prof. D. Fritsch. This is basically the subject of integrating DTM into GIS. The topics were:

- Introduction,
- Models of Height Integration,
- Importance of Height Integration in GIS,
- 2.5D Data Management, and
- 3D Query Space Spatial Operators.

Aspects of Database Implementation for Spatial Objects by Prof. R. Bill. This was a lecture of:

- Standard database technology,
- Non-standards requirements,
- Spatial access mechanism,
- Spatial query languages, and
- Spatial analysis and visualization.

Official Opening

Prior to the sessions, delegates and participants were introduced to the beautiful music of Strauss, and the ballet of the Vienna State Opera. Award presentations were the most important event in that evening session. Prof. F. Ackermann was granted the ISPRS Honorary Membership, Prof. Dr. Yuri S. Tjulflin received the Brock Gold Medal and Dr. Hans Gerd Maas was honoured with the Otto v. Gruber Award. Then, the official opening ceremony concluded by the keynote lecture of Prof. Gottfried Konecny. He spoke about "Paradigm Changes in ISPRS from the First to the Eighteenth Congress in Vienna".

Technical-Scientific and Poster Sessions

The presentations of all the seven ISPRS commissions were made of more than 800 papers, and they were running parallel almost for two weeks. The seven commissions were Commission I: *Sensors, Platforms and Imagery*; Commission II: *Systems for Data Processing, analysis and Representation*; Commission III: *Theory and Algorithms*; Commission IV: *Mapping and Geographic Information Systems*; Commission V: *Close-Range Techniques and Machine Vision*; Commission VI: *Economics, Professional Matters and Education*; Commission VII: *Resource and Environmental Monitoring*. Participants have to choose the most interested and most suitable for his/her field of interest. I found it was difficult for me to attend all the interested sessions. I wish I could be at all the interested places at the same time. The events were organized in such a way that it was hardly any body will get to all the sessions they want. I have managed to attend only 16 out of 131 sessions. The sixteenth were:

GIS Methods: Fuzzy set representation; Images for spatial analysis; GIS visualization; 3D data structure; Multimedia extensions with information systems.

- **Matching Techniques:** Matching in 2D and 3D; Image matching using complex conjugate; Least squares matching by search; Automatic registration of images; Automated measurement of ground control in large scale aerial photography.
- **Landscape Modelling and Road Extraction:** Uncertainty in GIS for road extraction; Knowledge based modelling of landscape; Road updating from imagery; Extraction of man-made features; Automatic DTM generation using aerial images and maps.
- **DEM Modelling Applications:** Interpolation in flight simulators; Global DTM modelling; Continental DEM generation using contour maps; Terrain visualization using 3D computer graphics and digital photogrammetry; DEM products using ASTER data; Shaded relief map of Mexico.
- **Integration of Photogrammetric Systems and Spatial Databases:** Digital photogrammetric workstations 1992-96; Digital photogrammetric stations revisited; VirtuoZo digital photogrammetry system; Stereoscopic image processing using digital photogrammetric system; Siscam softcopy photogrammetric workstation.
- **Remote Sensing and Photogrammetry for GIS Applications:** Digital photogrammetry joins GIS; GPS, image processing and GIS for coastal wetland mapping; Photogrammetry and field completion; Estimation of aerial evapotranspiration by remote sensing and GIS.
- **OEEPE (European Organization for Experimental Photogrammetric Research) A Partnership for Solving the European Mapping Problems:** Preliminary results of the OEEPE scanner test; Experimental test on fast ambiguity solutions for airborne kinematic GPS positioning; Updating complex database- the next step.
- **Industrial Measurements for Reverse Engineering and CAD/CAM:** Cad models for OO measurements; CAD based engineering with digital photogrammetry; Design and simulation of video digitizing; Comparison of digital and conventional non-metric camera; Terrestrial photogrammetric applications with CAD supported sensor; Spatially indexed image archives.
- **Integrating Vector and Raster Data in GIS:** GIS techniques and hybrid parametric/non-parametric image classification; Defining and representing temporal objects; "Delta" digital photogrammetric station; 3D space with digital cartography data; Spatial relation based on Voronoi diagram.
- **Design and Implementation of 3D-GIS:** Practical photogrammetry for 3D-GIS; Modelling of urban landscape; Hybrid data structures based on octree, tetrahedral in 3D-GIS; In transition of 2.5D to 3D GIS; Design and implementation of OO GIS software.
- **Data Structures for 3D GIS:** 3D GIS - status and prospects; Surface reconstruction based on triangular mesh; Spatio- temporal interpolation; Coupling GIS and environmental modelling; 3D representation of spatial object and topological relationships.
- **Computer Assisted Teaching:** PC based training for remote sensing and GIS; PC-TAS for analytical photogrammetry; Learning digital photogrammetry by personal computers; Photogrammetrist v.1.0 - the Greek way; Asean - image processing system for remote sensing training and education.
- **Conceptual Aspect of GIS:** Parcel-based information systems; Terrain morphology modelling; Digital surface models for volume objects; Requirements for photo realistic 3D modelling; Map symbol recognition using directed Hausdorff distance and neural network classifier; Spatial object database system; OO genetic algorithms in GIS; Spatial linear interpolation between sets; Theory on urban GIS.
- **Mapping Support to the Bosnian Peace Talks.** Presentation from US Military Mapping agency.
- **Hardware and Software Aspects of GIS:** VGIS - analytical GIS operations; Systems for integrated geoinformation; Semi-automatic digital photogrammetric system on PC; Client/server map visualization based on WWW; Industry trends for PC based GIS.
- **Applications of DEMs, Digital Orthoimages and Global Databases:** Development of digital orthophoto mapping; Construction of DEMs of textured areas using video images; TIN-based DTM application (a paper with Assoc. Prof. Ghazali Desa as co-author); Automated DTM of

coastal zones; DTM generation using photogrammetric techniques, GIS and GPS; Acquisition of map information from scanning images for GIS; Application of territorial GIS; Digital photogrammetry at Ordnance Survey of Ireland; Visualization of cartographic information using DTM; Constrained delaunay triangulation.

Technical Visits and Social Programmes

The author visited two research institutes and other interesting places, namely Institute for Photogrammetry and Remote Sensing at Technical University of Graz, Institute for Photogrammetry and Remote Sensing at Technical University of Vienna, and the City of Vienna Surveying Department. Several social programmes were arranged for the participants (not for free!). The author joined the excursion around the Danube canal, Vienna. This bicycle trip was led by Prof. Karl Kraus and it was very exciting trip. The group were shown to the surrounding areas of the famous man-made canal and other historical spots.

The Next ISPRS Congress

Amsterdam was voted to host the next congress. According to Prof. Molenaar of WAU, Holland and Prof. Beek of ITC, Holland, the tentative date for the coming congress is 16-22 July 2000, with "Geoinformation for all" as the theme.

Diantara manfaat yang diperoleh oleh calon:

- Mengetahui perkembangan penyelidikan terkini dalam bidang "Integration of DTM into GIS", "2.5D GIS", dan "3D GIS".
- Perkembangan dalam Object-Oriented GIS.
- Gunapakai digital photogrammetry untuk GIS.

Nota: Ketiga-tiga manfaat diatas memang sangat berguna dan berkait rapat dengan penyelidikan yang akan dijalankan di Glasgow nanti. Untuk ini, saya berterima kasih kepada fakulti, dan UTM amnya kerana membiayai saya ke persidangan ini.

Manfaat sampingan:

- Berpeluang berbincang dengan bakal penyelia (Dr. Jane Drummond) dan juga Head of Section (Topographic Science, Dr. Tait) berkenaan dengan penyelidikan yang akan dijalankan nanti. Beberapa cadangan dan tambahan dikemukakan untuk menjadikan calon lebih bersedia sebelum ke Glasgow.

Diantara cadangan kepada fakulti:

- Memohon sebagai ahli ISPRS - dengan harapan supaya segala perkembangan dalam penyelidikan, pembelajaran, projek bersama serantau (regional) dalam bidang utama ISPRS, iaitu remote sensing, fotogrametri, GIS boleh disertai dan diikuti.
- Lengkapkan beberapa kakitangan fotogrametri yang ada dengan bidang yang sedang diterokai oleh masyarakat fotogrametri antarabangsa. Tetapi, ini bergantung kepada arah tuju dan priority panel yang ada.