

ISSN 1682-1750

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

PROCEEDINGS

VOLUME
VOLUME
BAND

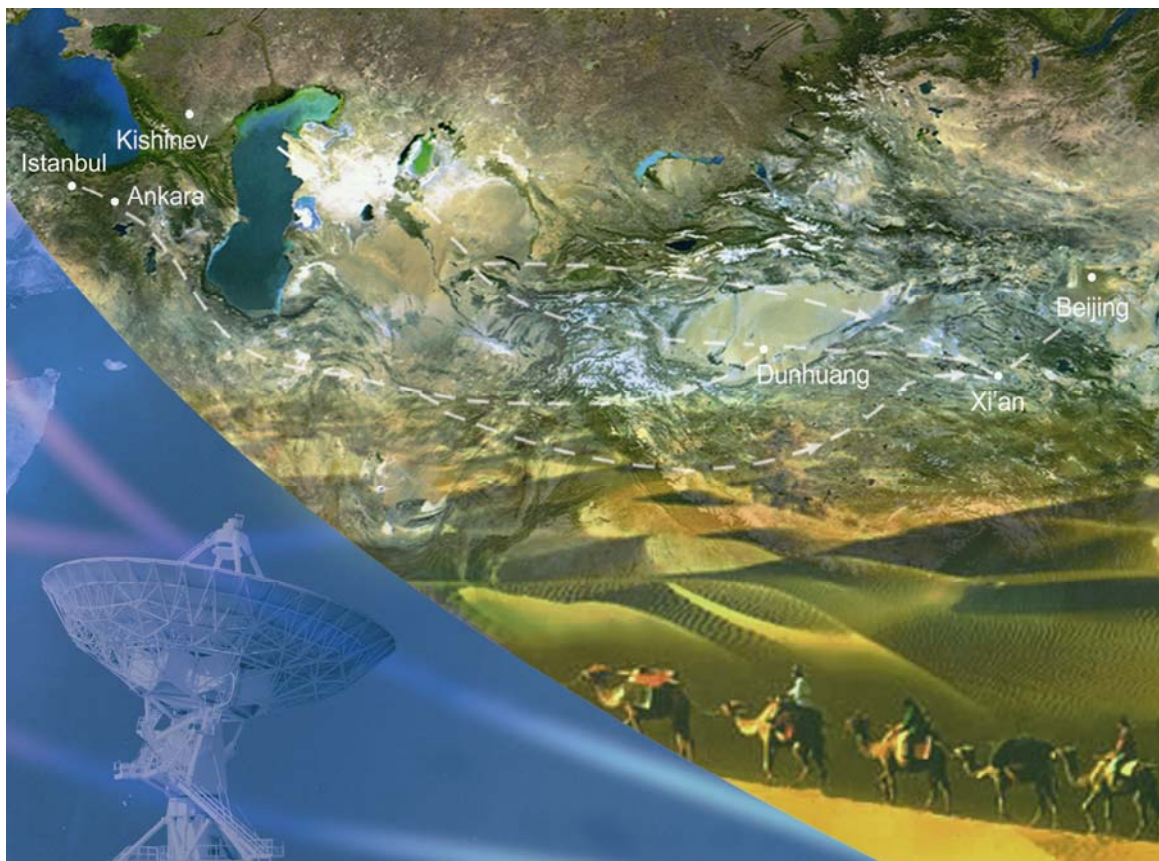
XXXVII

PART
TOME
TEIL

B2

COMMISSION
COMMISSION
KOMMISSION

II



Edited by:
CHEN Jun, JIANG Jie, Wolfgang KAINZ

This compilation © 2008 by the International Society for Photogrammetry and Remote Sensing. Reproduction of this volume or any parts thereof (excluding short quotations for the use in the preparation of reviews and technical and scientific papers) may be made only after obtaining the specific approval of the publisher. The papers appearing in this volume reflect the authors' opinions. Their inclusion in this publication does not necessarily constitute endorsement by the editors or by the publisher. Authors retain all rights to individual papers.

Copies of this book/CDROM are available from:

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

Copyright 2008

ISPRS Council 2004-2008

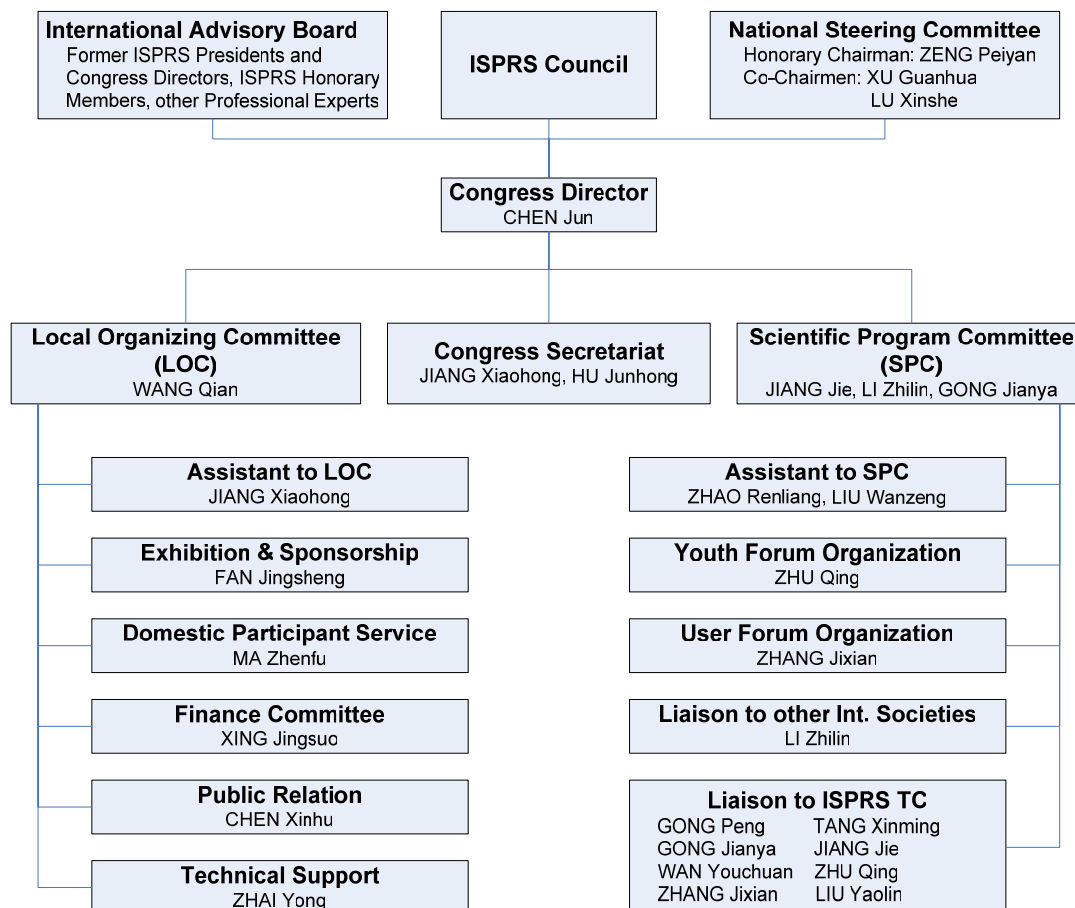
| | | |
|-----------------------|---------------------|----------------|
| President | Ian Dowman | United Kingdom |
| Secretary General | Orhan Altan | Turkey |
| Congress Director | Chen Jun | P. R. China |
| First Vice President | John Trinder | Australia |
| Second Vice President | Emmanuel Baltsavias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

Technical Commission Presidents 2004-2008

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

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

Congress Organising Committee



Introduction

Geographic information systems have been introduced more than 40 years ago. Over the decades more and more work has been devoted to establish not only a solid and operational software base but also a firm theory that should function as the foundation for the current technology and further development. Many scientific organizations have focused in various ways on the theory and practice of spatial data handling.

In 2004 at the Istanbul Congress ISPRS established a new structure for its technical commissions reflecting the increased need to devote more attention and efforts to spatial information science. Technical Commission II on Theory and Concepts of Spatio-temporal Data Handling and Information was established beside TC IV as one of the two Technical Commissions devoted to GIS. Considering the technical developments and state-of-the-art the Commission was organized into seven working groups and one inter commission working group between TC II and TC IV. WG II/1 focuses on spatio-temporal modeling which is a fundamental activity in spatial data handling. The subjects of spatial reasoning, analysis, and data mining are treated in WG II/2. Multiple representations of image and vector data are the subject of WG II/3; spatial planning and decision support systems are covered by WG II/4. Communication and visualization of spatial data as a link to cartography is the responsibility of WG II/5. An important topic in GIS is also system integration and interoperability which belongs to WG II/6. Finally, the aspects of the quality of spatio-temporal data and models are the focus of WG II/7. The inter-commission WG II/IV on dynamic and multi-dimensional systems and applications functions as the link between the more theory-oriented TC II and the application-oriented TC IV.

This volume reflects the developments in the field of TC II over the last four years and contains the papers submitted and accepted for presentation at the Congress in Beijing. I would like to thank all working group officers and authors for their continuing efforts and support of the commission work. I also would like to thank the Congress organizers for their hard work and successful organization of this event.

Wolfgang Kainz
President of ISPRS Technical Commission II

Vienna, May 2008

Table of Contents

WG II/1 Spatio-Temporal Modeling

| | |
|---|-----|
| A Support Vector Clustering Based Approach for Spatiotemporal Analysis in Security Informatics <i>Jon Devine, Anthony Stefanidis</i> | 1 |
| Dynamic Cartographic Representation of Spatio-Temporal Data <i>Yang ping, Tang Xinming, Wang Shengxiao</i> | 7 |
| Deriving Spatio-Temporal Relations from Simple Data Structure <i>Ale Raza</i> | 13 |
| Partial Least Squares Regression Based Cellular Automata Model for Simulating Complex Urban Systems <i>Y.J. Feng, X.H. Tong, M.L. Liu</i> | 19 |
| A Hierarchical Representation of Line-Region Topological Relations <i>Min Deng</i> | 25 |
| A Multi-Agent based Traffic Network Micro-simulation Using Spatio-temporal GIS <i>Mina Khalesian, M. R. Delavar</i> | 31 |
| Spatial and Dynamic Modelling Techniques for Land Use Change Dynamics Study <i>Novaline Jacob, Krishnan R, Prasada Raju PVSP, Saibaba J</i> | 37 |
| A Concept for Integrating Time-dependent Features in 3D Building Models <i>Hongchao Fan, Liqiu Meng, Uwe Stilla</i> | 45 |
| Exploring Space and Time: The Interaction of Transportation and Environment <i>H. Demirel, F. Gielsdorf, L.Gründig</i> | 51 |
| Study on the Change Detection Model and Method for Navigational Digital Map Data <i>Lianying Li, Lifan Fei</i> | 57 |
| Geo-spatial Modeling of Runoff of Large Land Mass: Analysis Approach and Results for Major River Basins of India <i>P. K. Gupta, S. Panigrahy</i> | 63 |
| Spatial and Temporal Patterns of Global H5N1 Outbreaks <i>Y.L. Si, P. Debba, A. K. Skidmore, A. G. Toxopeus, L. Li</i> | 69 |
| Spatiotemporal Analysis of Indian Mega Cities <i>H. Taubenböck, M. Wegmann, C. Berger, M. Breunig, A. Roth1, H. Mehl</i> | 75 |
| Extending Object-Relational Database to Support Spatio-temporal Data <i>Wang Huibing</i> | 83 |
| Multi-temporal Block Adjustment for Aerial Image Time Series: the Belvedere Glacier Case Study <i>E. Borgogno Mondino, R. Chiabrando</i> | 89 |
| Semantic Based LOD Models of 3D House Property <i>Mingyuan Hu</i> | 95 |
| A Unified Version-Based Spatio-temporal Data Model <i>Y.D. Li, X.H. Tong, M.L. Liu</i> | 103 |
| Research on the Edge of RS Image Based on Cloud Model <i>WANG Zuo-cheng, XUE Li-xia, Zhang Xi-ping</i> | 109 |
| Modeling Spatial Land Use Pattern Using Autologistic Regression <i>Y. N. Zeng, G. P. Wu, F. B. Zhan, H. H. Zhang</i> | 115 |
| Research on Change-of-Feature Based Spatio-Temporal Object Relational Model <i>XiaoChun Wu, Weihong Cui, YongQi Huang, XiaoDong Yang</i> | 119 |
| Incremental Contour Line Fusion Based on Line/Line Topological Relations | |

| | |
|--|-----|
| <i>Xing Han-fa, Zhou Xiao-guang, Xu Lilin</i> | 123 |
| Spatio-temporal Object Modeling in Fuzzy Topological Space <i>Anahid Bassiri, Ali A. Alesheikh, Mohammad R. Malek</i> | 131 |
| Invasive Species Spread Modeling Using Multi-resolution Remote Sensing Data <i>Le Wang</i> | 135 |
| Application of Model-based Geostatistics for Natural Hazards Identification <i>H. R. Ghafarian, A. Stein, A. Sharifi</i> | 143 |
| SOUTH GIS Structure and Its Application Concerning Government Affairs based on Component Technologies <i>WANG Chang-wei, XIE Gang-sheng, LIU Duan-feng</i> | 151 |
| A Study of GIS-SD Based Temporal-Spatial Modeling Spatial and Temporal Patterns of Global H5N1 Outbreaks of Water Quality in Water Pollution Accidents <i>Bo Zhang</i> | 155 |
| A Novel Vector Field Data Mining Approach: Extraction of Front Based on Physical Features of Target <i>D.D. Zhang, X.M. Yanga, F.Z. Sua, Y.Y. Dua, J.M. Gong</i> | 161 |
| WG II/2 Spatial Reasoning, Analysis, and Data Mining | |
| Use of Real-time Remote Sensing Data for Evaluating Soil Moisture and Salinity Effects on Light Penetration Depth <i>Cankut Ormeci, Ekercin</i> | 167 |
| Automatic Interpretation of Vector Databases with a Raster-based Algorithm <i>Volker Walter</i> | 175 |
| The Evaluation of Spatial Distribution Density in Map Generalization <i>Zhang Xiang, Ai Tinghua, Jantien Stoter</i> | 181 |
| Modelling Multi-temporal Land Use Changes <i>Jianquan Cheng</i> | 189 |
| A Hybrid Approach to Model Nonstationary Space-Time Series <i>T. Cheng, J.Q. Wang, X. Li, W. Zhang</i> | 195 |
| Three-dimensional Building Reconstruction Using Point Primitives: a Geometric Graph Approach <i>Chiung-Shiuan Fu, Jie Shan</i> | 203 |
| Identification and Assessment of Factors of Forest Depletion in Brunei Darussalam <i>K. Becek, J. O. Odihi</i> | 209 |
| Technical Design Methods for Spatial Data Production <i>BAI Zhigang, LIU Min, ZHANG Wenan, MIAO Xiaoli, CAO Haitang</i> | 215 |
| Knowledge Discovery by Spatial Clustering Based on Self-Organizing Feature Map and a Composite Distance Measure <i>Limin Jiao, Yaolin Liu</i> | 219 |
| Mining Association Rules in Geographical Spatio-temporal Data <i>Hong Shu, Xinyan Zhu, Shangping Dai</i> | 225 |
| Spatial Analysis Techniques Based on Data Field and Its Application In Land Gradation <i>LIU Yaolin, LIU Yanfang, He Jianhua</i> | 229 |
| Qualitative Detailed Description for Spatial Direction Relations <i>WANG Jing, JIANG Gang-wu, GUO Rui</i> | 237 |
| Cloud Model and Hierarchical Clustering based Spatial Data Mining Method and Application <i>Kun Qin, Min Xu, Yi Du, Shuying Yue</i> | 241 |
| Landscape Dynamics Analysis of Guide Wetlands In Yellow River Watershed By Landsat Series Data | |

| | |
|--|-----|
| <i>Xuying Shi, Fanghua Hao, Cheng Zhao, Dan Wang, Wei Ouyang</i> | 247 |
| A Pseudo Genetic Algorithm for Solving Best Path Problem <i>S. Behzadi, Ali A. Alesheikh</i> | 253 |
| on a New Model and Algorithm to Estimate Geographical Similarity between Document and Query in GIR System <i>Xing Lin</i> | 257 |
| Inverse Modelling for Spatial Distribution of Temperature Sensitivity of Soil Respiration (Q10) in China <i>T. Zhou, P. Shi, D. Hui, Y. Luo</i> | 263 |
| on the Framework and Key Techniques of Modern GIR Systems <i>Xing Lin, Yifang Ban</i> | 269 |
| Research on Geographical Feature Spatio-Temporal Reasoning Model and Visualization of Thematic Element Based on Statistics Data Mining <i>Dongmei Yu, Rentao Huang, GuanYan</i> | 277 |
| A Clustering Algorithm of Land Grades Based on Cloud Histogram <i>HU Shiyuan, LI Deren, LIU Yaolin, LI Deyi</i> | 285 |
| Study of Image Magnification Based on Crvelet Transformation <i>Chao Chen, Jiang Tao</i> | 289 |
| DEM-based Investigation on Stream Network Nodes and Their Features <i>Shanshan GE, Guoan TANG</i> | 293 |
| Simulating Remotely Sensed Imagery for Classification Evaluation <i>Desheng Liu</i> | 299 |
| Defining 3D Spatial Neighborhoods for Topological Analyses Using a 3D Network-Based Topological Data Model <i>Inhye Park, Jiyeong Lee</i> | 305 |
| A Study and Experiment on Spatial Statistical CharacterIStic to Discover River Structure knowledge <i>Yang Pinfu, Wu Xiaoyan</i> | 311 |
| Evaluation of Optimum Methods for Predicting Pollution Concentration in GIS Environment <i>R. Shad, H Ashoori, N. Afshari</i> | 315 |
| A Rapid Method of Illegal Mining Information Extraction <i>Lin Aihua, Yue Jianwei, Pan Xiaojun, Wang Bin, Chen Luyao</i> | 321 |
| Shadow Detection of Urban Aerial Images Based on Partial Differential Equations <i>Yue Wang, Shugen Wang</i> | 325 |
| Effect of DEM Resolution on the Simulation of Astronomical Radiation <i>Yang Xin, GE Shanshan, TANG Guoan, Feng Xinyu</i> | 329 |
| The Design and Implementation of Ontology and Rules Based Knowledge Base for Transportation <i>Gang Cheng, Qingyun Du</i> | 335 |
| Visualization of Space-borne Synthetic Aperture Radar (SAR) Doppler Parameter Estimation and Its Application in Topographic Surveying and Mapping <i>Z. W. Zhou, G. M. Huang, M. H. Yang, S. C. Yang</i> | 341 |
| Study on the Uncertain Directional Relations Model Based on Cloud Model <i>Tang Xuehua, MENG Lingkui, Qin Kun</i> | 345 |
| Similarity Measurement of Terrain Skeletons by Topological Indices and Spatial Orientation Information <i>Luo Mingliang, Tang Guoan</i> | 351 |
| A Systematic Classification Research of Topographic Descriptive Attribute in Digital Terrain Analysis <i>Dong Youfu, Tang Guoan, ZHANG Ting</i> | 357 |
| Research and Application of Image Denoising Method Based on Curvelet Transform | |

| | |
|---|-----|
| <i>Jiang Tao, ZHAO Xin</i> | 363 |
| The Uncertainty Inquiry of Land Price Information Based on Cloud Model <i>Hu Shiyuan, LI Deren, LIU Yaolin, LI Deyi</i> | 369 |
| WG II/3 Multiple Representations of Image and Vector Data | |
| Optimal Simplification of Building Ground Plans <i>Jan-Henrik Haurert, Alexander Wolff</i> | 373 |
| Visualizing Schematic Maps through Generalization Based on Adaptive Regular Square Grid Model <i>Dong Weihua, Liu Jiping, Guo Qingsheng</i> | 379 |
| The Study on the Choice of Optimal Scale in Image Classification <i>P. Han, J.Y. Gong, Z.L. Li, L. Cheng</i> | 385 |
| Identify Building Patterns <i>Weiping Yang</i> | 391 |
| Generalization of Textured 3D Building Models for Map-Like Presentations <i>Martin Kada</i> | 399 |
| Extraction of Building Ground Plans from LIDAR Data <i>Hauke Neidhart, M. Sester</i> | 405 |
| Progressive Transmission of Vector Map on the Web <i>AI Bo, AI Tinghua, TANG Xinming</i> | 411 |
| An Automated Cartographic Generalization Process: A Pseudo-physical Model <i>J. Joubran Abu Daoud, Y. Doytsher</i> | 419 |
| An Object-oriented Model for Representation Period over Scale Space <i>Tinghua Ai, Jingzhong Li</i> | 425 |
| How the Quality of Cartographic Generalization Is Assured – the Approach with an Automatic Cartographic Generalization Chain <i>H. Z. Qian, Y. Xu, L. Q. Meng, Q. Y. Song</i> | 433 |
| Progressive Representation and Generalization of Street Network Vector Data <i>J. Tian</i> | 439 |
| Comparison of Tile Server Design Approaches for Web-based 3-D Geo-visualization <i>Tao Wang, Jianhua Gong</i> | 445 |
| An Approach to Building Grouping Based on Hierarchical Constraints <i>H. B. Qi *, Z. L. Li</i> | 449 |
| Study on Overlaying Remote Sensing Image on Surface-underground Contrast Plan <i>S. J. Mao, S. L. Peng, J. Z. Chen, M. Li</i> | 455 |
| Study on the Methods of Super-resolution Image Reconstruction <i>H.Y.LIU, Y.S.ZHANG, Song JI</i> | 461 |
| Quality Inspection and Quality Improvement by Map Fusion <i>Hainan Chen, Volker Walter, Dieter Fritsch</i> | 467 |
| A Neural Network Algorithm for Vectorization of 2D Maps <i>H. Karabork, B.Kocer, I.O. Bildirci, F.Yildiz, E.Aktas</i> | 473 |
| Preserving Ground Plan and Facade Lines for 3D Building Generalization <i>Michael Peter, Norbert Haala, Dieter Fritsch</i> | 481 |
| An Improved Method of Remote Sensing Image Compression Based on Fractal and Wavelet Domain | |

* Corresponding author. Tel.: +852 2766 5977; fax: +852 2330 2994; E-mail address: Lsgi.hbqi@polyu.edu.hk.

| | |
|--|-----|
| <i>Yu Jie, Zhang Zhongshan, Qin Hailing, Guo Peihuang, Zhang Guoning</i> | 487 |
| DragonFly – Interactive Visualization of Huge Aerial Image Datasets <i>B. Reitinger, M. Hoefler, A. Lengauer, R. Tomasi, M. Lamperter, M. Gruber</i> | 491 |
| Informational Associating Model Based on Spatial Scaling of Satellite Images and Application <i>Jianzhong Feng, Huajun Tang, Zhongxin Chen, S. Qingbo Zhou, Linyan Bai</i> | 495 |
| Suitable Region Selection Algorithm Based on Multiple Restrictions <i>KE Xi-lin, GUO Qing-sheng, ZHANG Yue-peng, HUANG Li-min, LI He-yua, JIN Cheng</i> | 503 |

WG II/4 Spatial Planning and Decision Support Systems

| | |
|---|-----|
| Development of a Decision Support System for Natural Damage Assessment Based on Remote Sensing and Bio-Physical Models <i>M.A. Sharifi, W.G.M. Bastiaanssen, S.J. Zwart</i> | 509 |
| A Spatial Decision Support System Framework for Climate Change Adaptation in Victoria <i>C. J. Pettit, A. B. M. Russel</i> | 515 |
| A Solution to Operation Conflict in Collaborative Spatial Decision Support System <i>C. Y. He, G. Han, J. Chen</i> | 521 |
| Implementation of Non-Java based Interfaces to Embed Existing Models in Spatial Decision Support Systems - Case Study: Integration of MS® Excel-models in IWECS <i>R. Laudien, S. Klose, A. Klose, C. Rademacher, S. Brocks</i> | 527 |
| Development a Spatial Planning Support System for Agricultural Policy Analysis Case Study: Borkhar District, Iran <i>B. Farhadi Bansouleh, M.A. Sharifi, H. Van Keulen</i> | 533 |
| Land Suitability Assessment PSE Design and Implement Based on Web Service <i>Yu Yan, He Jianhua, Liu Yaolin</i> | 539 |
| The Method of Warehouse Location Selection Based on GIS and Remote Sensing Images <i>Ji Hui Feng, Xu Aigong</i> | 545 |
| 3D Spatial Operations for Geo-DBMS - Geometry VS. Topology <i>T.K. Chen, A. Abdul-Rahman, S. Zlatanov</i> | 549 |
| Construction on Decision Support System for Route Location Based on GIS <i>Tae-Ho, Roh, Jong-Chool, Lee, Hee-Gyoo, Kim, Jong-Ju, Kim, Yeoung-Hwa, Jung</i> | 555 |
| A Study of the Theory and Modeling of Battlefield Environment Analysis Based on Geographic Information <i>Kang Xin, Zhang Wenshi, Song Yingjin, Zhao Peng</i> | 567 |
| The Study of Integration of Digital City Planning Data Based on the Ontology <i>Luo Jing, DANG An-rong, MAO Qi-zhi</i> | 571 |
| The Study on the Method of Approximate Estimation of Earthquakes in Zhejiang Province Based on GIS and GDP <i>Dongping Li, Jinghui Zhao</i> | 577 |
| Model Tropical Legume Trees for Reversing Soil Degradation as a Solution for Increasing Rural Farmers Income by GIS Analysis <i>Bandara KRMU, Henri Eisenbeiss, Martijn Sonneveld, Chaminda Egodawatta</i> | 581 |
| Development of a Heuristic Approach for Wayfinding and Navigation in a Street Network as a Geographic Space <i>Gharani, P, M. R. Delavar</i> | 587 |
| Fuzzy Analytical Hierarchy Process in GIS Application <i>M.H. Vahidnia, A. Alesheikh, A. Alimohammadi, A. Bassiri</i> | 593 |

| | |
|---|-----|
| Applying Sleuth for Simulating and Assessing Urban Growth Scenario Based on Time Series TM Images: Referencing to a Case Study of Chongqing, China <i>Jingnan Huang, Jinting Zhang, X.X. Lu</i> | 597 |
|---|-----|

| | |
|---|-----|
| The Utilization of Satellite Images in Urban Conservation Planning <i>M.C.Meshur, T.Cay, E.Sert</i> | 607 |
|---|-----|

WG II/5 Communication and Visualization of Spatial Data

| | |
|---|-----|
| A Cartographic Data Modal for Better Geographical Visualization Based on the Cartographic Knowledge <i>Yang MEI, Lin LI</i> | 611 |
|---|-----|

| | |
|--|-----|
| Integration of LIDAR and Airborne Imagery for Realistic Visualization of 3D Urban Environments <i>A. F. Habib, J. Kersting, T. M. McCaffrey, A. M. Y. Jarvis</i> | 617 |
|--|-----|

| | |
|--|-----|
| Service Oriented Architecture (SOA) Based Web Services for Geographic Information Systems <i>K. Sahin, M. U. Gumusay</i> | 625 |
|--|-----|

| | |
|--|-----|
| Communication and Visualization of 3D Urban Spatial Data According to User Requirements: Case Study of Geneva <i>C. Carneiro</i> | 631 |
|--|-----|

| | |
|---|-----|
| Animating Basic Operations for Digital map Generalization with Morphing Techniques <i>Zhilin LI, Meiling Wong</i> | 637 |
|---|-----|

| | |
|---|-----|
| Rendering 3D Vector Data Using the Theory of Stencil Shadow Volume <i>Chenguang Dai, Yongsheng Zhang, Jingyu Yang</i> | 643 |
|---|-----|

| | |
|---|-----|
| 3D Modeling and Data Organization of Power Transmission based on Digital Earth <i>Zhangyongzhi, Xionghanjiang, Zhaofusheng, Linxuehua</i> | 649 |
|---|-----|

| | |
|---|-----|
| Visualization of Road Slope Aspect for Fixed Assets Appraisal of Lands using DEM <i>Takuya Sakai, Hirofumi Chikatsu</i> | 655 |
|---|-----|

| | |
|---|-----|
| 3D GIS Example in Historical Peninsula of Istanbul <i>A. Sengul</i> | 659 |
|---|-----|

| | |
|--|-----|
| Design and Implementation of Decision-making Support System for Thematic Map Cartography <i>Liping ZHANG, Qingsheng GUO, Lili JIAO</i> | 665 |
|--|-----|

| | |
|--|-----|
| Spatial Data Representation Model Oriented to Geographical Problem Solving <i>Hongjun Su, Yongning Wen, Min Chen, Hong Tao, Jingwei Shen</i> | 671 |
|--|-----|

| | |
|---|-----|
| A New Restitution Algorithm to Solve the Multipath Fading Problem in Aerial Communication <i>ZHANG Shuangna, FENG Liqiang</i> | 677 |
|---|-----|

| | |
|---|-----|
| Registration of Spatial data Based on PCA <i>Shang Tao, Wang Lili</i> | 681 |
|---|-----|

WG II/6 System Integration and Interoperability

| | |
|--|-----|
| Semantic Data Integration across Different Scales: Automatic Learning of Generalization Rules <i>Birgit Kieler</i> | 685 |
|--|-----|

| | |
|--|-----|
| GeoNLP: a Tool for the Extraction of Semantic Information from Definitions <i>M. Kokla</i> | 691 |
|--|-----|

| | |
|--|-----|
| Ontology Development for Interoperability of Observation Data <i>Masahiko Nagai, Masafumi Ono, Ryosuke Shibasaki</i> | 697 |
|--|-----|

| | |
|--|-----|
| Ontology-based Land Degradation Assessment from Satellite Images <i>E. Tomai, I. Herlin, J.-P. Berroir, P. Prastacos</i> | 703 |
|--|-----|

| | |
|---|-----|
| Design of Geo-ontology Based on Concept Lattice <i>Hong Wang, Lin Li, Ping-chao Song</i> | 709 |
| A WFS Based Geographical Features Service Approach for Internet GIS <i>Penglin Zhang, Feng Zhang, Bolin Ruan, Zhiyong Lv</i> | 715 |
| Geospatial Sensor Web Data Discovery and Retrieval Service Based on Middleware <i>Nengcheng Chen, Liping Di, Genong Yu, Zeqiang Chen, Jie He</i> | 721 |
| Integration of High Resolution Quicbird Images to GoogleEarth <i>M. Alkan, U.G. Sefercik, M. Oruç</i> | 727 |
| A Study on Ontology-Driven Geo-Information Retrieval Mechanism in the Semantic Web <i>Xu Quan-Li, Yang Kun, Wang Jun, Peng Shuang-Yun, Yi Jun-Hua</i> | 733 |
| The Construction of Urban and Rural Integrative Cadastral Management Information System <i>XU De-jun, ZHONG Mei, DU Qing-yun</i> | 739 |
| Ontology based Semantic Metadata for Imagery and Gridded Data <i>CHEN Xu, ZHU Xinyan, DU Daosheng</i> | 743 |
| Applying Integrated DGPS/IMU Systems to Stereo Plotting <i>WU Fang, ZHENG Xiong-wei, WANG Jian-chao, GUO Da-hai, ZHANG Zong-gui</i> | 749 |
| Cross-platform Adaptive GIS Symbolize Research <i>SU Kehua, ZHU Xinyan, KONG Fanmin</i> | 751 |
| An Introduction of Commercial Earth Observation by Synthetic Aperture Radar with TerraSAR-X in Japan <i>T.Hiramatsu, S.Hikosaka, Y.Matsui, M.Ogawa, H.Okada, A.Suehiro, J.Saito</i> | 755 |
| Selection and Customization of an Integrated Digital Photogrammetric Workstation + GIS Configuration and Optimization of the Interoperability within the Workflow for Updating the Belgian Topographical Reference Database <i>Jan Beyen, J. Henrion, S. Van de Velde</i> | 757 |
| LIDAR and Pictometry Images Integrated Use for 3D Model Generation <i>F. Prandi, C. Achille, R. Brumana, F. Fassi, L. Fregonese</i> | 763 |
| WG II/7 Quality of Spatio-Temporal Data and Models | |
| Quality Assessment of 3D Building Data by 3D Surface Matching <i>Devrim Akca, Mark Freeman, Armin Gruen, Isabel Sargent</i> | 771 |
| Multi-hierarchical Quality Assessment of Geo-Spatial Data <i>C. Becker, M. Ziems, T. B"uschenfeld, C. Heipke, S. M"uller, J. Ostermann, M. Pahl</i> | 779 |
| A Modified Forward Search Approach Applied to Time Series Analysis <i>M. Pesenti, M. Piras</i> | 787 |
| Error Propagation in the Production of DEM-DOM-DLG by Digital Photogrammetry <i>Jingxiong Zhang, Miao Lu, Hao Gong, Na Yao</i> | 793 |
| Quality Evaluation of Generalization Algorithms <i>Yevgeniya Filippovska, Volker Walter, Dieter Fritsch</i> | 799 |
| Spatial Prediction of Transport Related Urban Air Quality <i>E. Sertel, H. Demirel, S. Kaya, I.Demir</i> | 805 |
| A Framework for the Fusion of Digital Elevation Models <i>H. Papasaika, D. Poli, E. Baltasvias</i> | 811 |
| The Quality Assessment and Sampling Model for the Geological Spatial Data in China <i>Huan XIE, Xiao-hua TONG, Zuo-qin JIANG</i> | 819 |
| Error Propagation Modeling in GIS Overlay <i>Jinda Sae-Jung, Xiao Yong Chen, Do Minh Phuong</i> | 825 |

| | |
|---|-----|
| Near Real Time CCD Array Health Characterization of Cameras onboard IRS <i>Shailendra S Srivastava, Hetal Pandya, Y. P. Desai, Sampa Roy, Bankim Shah, S S Palsule, B Kartikeyan, N K Vyas, Jagdish Rai</i> | 837 |
| Simulation and Model Validation of Positional Uncertainty of Line Feature on Manual Digitizing a Map <i>H. S. Wu, Z. L. Liu</i> | 843 |
| A Software Package to Check the Aerial Frames Blocks from GPS/IMU-Assisted Cameras <i>A. Maffei, L. Pinto</i> | 849 |
| A Three-dimensional Error Model of DEM Based on the Reconstruct Contours <i>Zhiwei Wang, Changqing Zhu, Qisheng Wang</i> | 857 |
| Automated Quality Control of Digital Terrain Models <i>T. Jancso</i> | 863 |
| Uncertainties in Remote Sensing Information Appraise Based on Theory of Rough Sets <i>Yue Tong, Weidong Song, Quanhua Zhao</i> | 869 |
| A New Approach for Checking Elevation Contradiction of Contour elevation <i>HE Yan-fei, QI Hua, ZENG Yan-wei</i> | 875 |
| Use of the SRTM DEM as a Geo-referencing Tool by Elevation Matching <i>J. A. Gonçalves, A. M. Morgado</i> | 879 |
| Information-theoretic Perspectives of Image-based Categorical Mapping <i>Zongjian Lin, Yan Chen, Jingxiong Zhang, Bing Deng</i> | 885 |

ICWG II/IV Dynamic and Multi-dimensional Systems and Applications

| | |
|---|-----|
| Dynamic Field Process Simulation within GIS: the VORONOI Approche <i>L. Hashemi Beni, M. A. Mostafavi, J. Pouliot</i> | 891 |
| Multi-scale Spatial Modeling for Geological Body Based on GTP Model <i>CHE De-fu, WU Li-xin, YIN Zuo-ru</i> | 899 |
| A 3D GIS's Spatial Data Model Based on Cell Complex <i>Zhou liangchen, Lu guonian, Sheng yehua, Xu hongbo, Wang haixia</i> | 905 |
| Automatic Generation Triangulated Surfaces with Normal Faults and Reverse Faults <i>J. Z. Chen, M. Li, S.J. Mao, W. Xiong</i> | 909 |
| Implementing 3D Network Analysis in 3D-GIS <i>Ivin Amri Musliman, Alias Abdul Rahman, Volker Coors</i> | 913 |
| Discussion on 3D Aids to Navigation Planning and Setting Based on GIS and VR <i>Haigang Sui, Jinghuan Xiao, Jiali Chen, Wenjuan Mao, CHINA</i> | 919 |
| An Interactive Visualization Model Based on QTM <i>Wenbin Sun, Zhao Xuesheng</i> | 925 |
| Describing and Computing Model of the Topological Relation in Spherical Surface Quaternary Triangular Mesh <i>HOU Miao-le, ZHAO Xue-sheng, CHEN Jun</i> | 931 |
| Combining Algorithm with Knowledge for Way-finding <i>QU Rong, WENG Min, DU QingYun, CAI ZhongLiang</i> | 937 |
| Three Dimensional Property Right Problems and Suggestions for Turkey <i>I. E. Ayazli, F. Batuk, J. Stoter</i> | 941 |
| Generalization of Fundamental City Spatial Model for the Data Generation Satisfied with User's Requirements <i>Oh Sojung, Impyeong Lee, Juseok Hong</i> | 945 |

| | |
|---|-----|
| Thermal Control and Thermal Sensors of Observation Satellite <i>A. Nazari, H. Emami</i> | 949 |
| A Hybrid LOD Algorithm Based on TIN Modelling <i>Zhenhua Feng, Hua. Qi</i> | 953 |

Theme Session: ThS 4: High performance visualization

| | |
|--|------|
| The “Photogrammetric Load Chain” for ADS Image Data: an Integral Approach to Image Correction and Rectification <i>M. Downey, U. Tempelmann</i> | 957 |
| Generating Progressively Spatial Data Streaming for Adaptively Mobile Visualization <i>Bisheng Yang</i> | 963 |
| The Future of Virtual Globes - the Interactive Ray-Traced Digital Earth <i>M. Christen</i> | 969 |
| Interoperable Three-Dimensional GIS City Modeling with Geo-informatics Techniques and 3D Modeling Software <i>Chayakrit Malumpong, Xiaoyong Chen</i> | 975 |
| On Point Feature Automatic Annotation Placement in 3D Environment <i>Jingwei Shen, Yongning Wen, Yongjun Wang, Min Chen, Hongjun Su</i> | 981 |
| A Robust Estimation Algorithm of Epipolar Geometry through the Hough Transform <i>Shan Haitao, Hao Xiangyang, Wang Hui, Li Dawei, Li Jie</i> | 985 |
| Pyramid Management and Real-time Visualization of Massive 3-Dimensional Terrain Data <i>KE Xi-lin, GUO Qing-sheng, LI He-yuan, CHEN Gang, GAO Ping, ZHOU Yan, HUANG Li-min</i> | 991 |
| A Fuzzy-based Method for Remote Sensing Image Contrast Enhancement <i>Chi-Farn Chen, Hung-Yu Chang, Li-Yu Chang</i> | 995 |
| The Study on Rapid Visualization of Global Massive Spatial Dataset Processing <i>Hujingbo, Xionghanjiang, Zhangyongzhi, Zhaofusheng</i> | 1001 |
| Study on the Basic Tone of Thematic Map Color <i>Gao Jianjun</i> | 1005 |
| High Efficient Classification on Remote Sensing Images Based on SVM <i>Qiu Zhen Ge, Zhang Chun Ling, Li. Qiong, Xin Xian Hui, Guo Zhang</i> | 1011 |

Theme Session: ThS 5 - Component-Based GIS

| | |
|---|------|
| Implementation of a Customized GIS-based Tool for Tunnel Construction Sites Management <i>Nazereh Nejatbakhsh</i> | 1015 |
| Digital Terrain Modeling in a GIS Environment <i>Eric Kwabena Forkuo</i> | 1023 |

Theme Session: ThS 6 - Emerging technologies for display and visualization

| | |
|--|------|
| Analysis on Geographical Changes and Research on Spatio-temporal Patterns <i>Yang ping, Tang Xinming, Wang Huibing</i> | 1031 |
| Connected 2D and 3D Visualizations for the Interactive Exploration of Spatial Information <i>S. Bleisch, S. Nebiker</i> | 1037 |
| Animated Representation of Uncertainty and Fuzziness in Dutch Spatial Planning Maps <i>Qiuju Zhang, Connie A. Blok, Xinming Tang</i> | 1043 |
| Relevance of Visual Exploration for Strengthening Spatial Thinking & Spatial Knowledge Exploration | |

| | |
|---|-------------|
| <i>Abdulvahit Torun, Şebnem Düzgün.....</i> | <i>1049</i> |
| ERDAS TITAN: Connect and Share Your World | |
| <i>Amy Zeller, Rob Clout.....</i> | <i>1057</i> |
| Society Networking Model Supporting Collaborative 3D GIS Environment Based on Multi-agent Method | |
| <i>Z. E. Chang, S. Li.....</i> | <i>1059</i> |
| Indoor SPATIAL Analysis Using Space Syntax | |
| <i>Hyeyoung Kim, Chulmin Jun, Yongjoo Cho and Geunhan Kim.....</i> | <i>1065</i> |
| Red Relief Image Map: New Visualization Method for Three Dimensional Data | |
| <i>Tatsuro CHIBA, Shin-ichi KANETA, Yusuke SUZUKI.....</i> | <i>1071</i> |
| Combinative Representation of TLS Point Cloud and 3D Virtual Reality for Cultural Heritage Preservation Planning | |
| <i>Shengtao Lu, Ruoming Shi*, Guang Zhu.....</i> | <i>1077</i> |
| Study on Smoothing Browser in Multi-view Virtual Space Based on Panorama | |
| <i>Li Yi-jing.....</i> | <i>1081</i> |
| Special Session: SS 2 - Digital Earth: Status and Trends | |
| Virtual Australia - the Next Generation of Research Investments to Help Shape a Nation | |
| <i>Peter Woodgate, L. Coppa.....</i> | <i>1085</i> |
| Digital Earth Science Platform: DESP/CAS | |
| <i>Guo Huadong.....</i> | <i>1089</i> |
| Trends in Digital Photogrammetry from an International Enterprise Perspective | |
| <i>R. W. Schroth, Jing Wang, Wu Dun, W. Mayr.....</i> | <i>1093</i> |
| Special Session: SS 15 - Future of Geographic Information Science | |
| ISO/OGC Standards Impact on Next Generation Enterprise Spatial Platform | |
| <i>Belay Teka Beshah, Max Martinez, Mladen Stojic.....</i> | <i>1099</i> |
| A Study of Geographic Models Integration in Distributed Collaborative Design | |
| <i>Hui. Yang, Guonian Lu , Yongning Wen , Yi Yang, Ying Hu.....</i> | <i>1105</i> |
| Research on the Distributed Parallel Spatial Indexing Schema Based on R-TREE | |
| <i>Yuan-chun Zhao, Cheng-ming Li.....</i> | <i>1113</i> |
| Test Results of RTK and Real-Time DGPS Corrected Observations Based on NTRIP Protocol | |
| <i>T. L. Dammalage, L. Samarakoon.....</i> | <i>1119</i> |
| Universal Error Propagation Law | |
| <i>Xiaoyong CHEN, Shunji MURAI.....</i> | <i>1125</i> |