

ISPRS Congress Resolutions Approved by the General Assembly - 9th July 2008

General Resolution - Appreciation to Chinese Society and Organisers of the Congress

The Congress Commends:

The Chinese Society for Geodesy, Cartography and Photogrammetry, its President Yang Kai, and Congress Director Prof. Chen Jun, the State Bureau for Surveying and Mapping and the Congress Organizing Committee for their excellent work which has resulted in a very successful Congress.

Technical Resolutions

Resolution I.1 Calibration and Certification of Sensors

The Congress

Noting

- the increasing activity in certification of digital cameras, particularly in North America and Europe
- the existence of very few test fields appropriate for sensor calibration and validation

Recognizing

- the need for all types of sensors (airborne lidar, space-borne sensors, etc.) to be calibrated and validated
- the requirement for common calibration and validation standards and for sharing test fields

Recommends

- the development of calibration and certification processes for relevant sensors, including the adoption of internationally accepted guidelines and the sharing of data and test fields between countries, through close cooperation with other organizations, system manufacturers and research teams.

Resolution I.2 Unmanned Vehicle Systems (UVS)

The Congress

Noting

- that unmanned land, air or underwater vehicle systems have become increasingly used for remote data acquisition
- that these systems have introduced remote data acquisition in new fields and for new applications
- that these systems offer the remote sensing community tools and opportunities for rapid instrument and application development
- that these systems strengthen the role of photogrammetry in geoinformation education

Recognising

- the need for better knowledge and critical in-situation data during natural or man-made crises and exploration in extreme environments
- the opportunity for cost reduction offered by unmanned systems

Recommends

- organisation of a workshop to bring together all relevant ISPRS WGs in cooperation with the general UVS community;
- a study to compare UVS in terms of quality, performance and cost, having regard to conventional techniques;
- the topic of integrated data acquisition from multiple sensors and platforms be addressed;

Resolution I.3 High Resolution Sensors for Topographic Mapping

The Congress

Noting

- the continuing increase in the number of high resolution satellites with increased resolutions
- the need for accurate and detailed DEMs, covering large areas
- the difficulty to generate current topographic maps in many countries

Recognizing

- the need for geometric and radiometric testing, calibration and evaluation of high and very high resolution optical space sensors and SAR satellites
- the potential of satellite borne high resolution optical stereo and interferometric SAR imaging systems for topographic mapping

Recommends

- the investigation of DEM generation based on new space sensors
- the investigation of the integration and fusion of data from multiple sensors for optimized mapping applications

Resolution II.1 Multi-dimensional, Multi-thematic and Multi-resolution Spatial Information for Spatial Decision Support Systems

The Congress:

Noting

- Increasing availability of spatial data in different temporal, thematic and geometric resolutions
- that many urgent issues facing mankind require detailed spatial data
- the development of sensor web technology allowing distributed sensors to measure and locally communicate geospatial information

Recognizing

- the critical role of explicit semantics and ontologies of geospatial data
- the potential of such data for decision support
- the need for data integration in order to exploit the richness of the individual data sets
- the need to identify appropriate spatial information for dedicated applications via the Internet

Recommends

- the development of methods and tools for the mining of multi-resolution spatio-temporal data, and its semantic and geometric integration and analysis
- establishment and development of techniques for intelligent sensor data integration
- the development of efficient storage methods for multi-dimensional and multi-temporal data
- the establishment of benchmarks and sample data sets for testing proposed solutions in spatial data handling and for quality control

Resolution II.2 Pervasive Geo-computing and Services

The Congress:

Noting

- the general trends towards miniaturization, and towards ubiquitous and wearable computing
- new applications of spatial data and spatial computing, e.g. in traffic and personal navigation
- the fast emergence of Web 2.0
- the paramount role of the Internet and location-based services, and ‘virtual globes’ in society

Recognizing

- the increasing potential of the Web for dissemination of spatial information
- that ‘virtual globes’ offer a more intuitive view of spatial phenomena for a wider audience than conventional maps
- the challenges of efficient storage and processing of vast amounts of spatial data

Recommends

- the encouragement of research in pervasive geo-computing
- the development of geospatial data processing techniques using distributed services and grid computing
- the development of Web search engines for spatio-temporal data

Resolution II.3 Geovisualization of Multi-dimensional Data

The Congress:

Noting

- an increasing demand by the general public for visualization of spatial data
- the wide availability of on-line and Web-based visualization products
- the availability of huge, complex, multi-dimensional geospatial data sets, and the development of new visualization devices (such as globe displays, smart paper, touch tables)

Recognizing

- that the integrated visualization of multi-dimensional (3D++) data offers major challenges
- that visualization plays an important role in all ISPRS disciplines
- the need for collaborative visualization using a variety of devices

Recommends

- the encouragement of research into novel visualization technologies for spatial data
- the development of strategies and methods for collaborative geo-visualization of dynamic phenomena in cooperation with TC IV
- the development of advanced methods for visualization of, visual analytics for, and interaction with, multi-dimensional heterogeneous data complementing the work of TC IV

Resolution II.4 Cooperation with other Organizations and Groups in the Geoinformation Science Domain

The Congress:

Noting

- the variety of organizations and groups dealing with geoinformation science (IGU, ICA, GIScience, AGILE, etc)
- the increasing number of workshops, symposia and conferences in this discipline
- the recent identification of geoinformation science as an important ISPRS topic and the assignment of a Commission to it
- that ISPRS symposia have not yet attracted the scientific community in the geoinformation science domain to the desired degree
- that the reputation of the symposia of some of the other organizations is currently higher

Recognizing

- the determination of ISPRS to strengthen its position in the geoinformation science domain
- the importance for geoinformation science of image data, as well as quick data capture and data update by a variety of distributed sensors
- the need to transfer contributions and strengths of ISPRS research in this domain to the other groups

Recommends

- that cooperation with other organizations be strengthened in order to identify key research questions
- joint workshops and symposia
- increasing the attractiveness of ISPRS events through reviewed publications and highly interactive workshops

Resolution III.1: Integrated Evaluation of Range and Image Data

The Congress:

Noting

- the rapid technological development of 2D and 3D sensor systems, such as airborne and terrestrial lidar systems,
- their ability to provide full waveform as well as spectral information, and
- the availability of high resolution off-the-shelf frame cameras.

Recognizing

- the need for high resolution and up-to-date 3D information especially in urban areas for 3D city modelling, in forest areas for high accuracy inventory and planning,
- the difficulty of exploiting the accuracy of the sensors, and
- the different mode of operation and large gap in resolution between range and image data.

Recommends

- the encouragement of research in automatic calibration and orientation methods for range and image data,
- the analysis of the potential of lidar signals for information extraction, and
- fostering research on the integrated evaluation of lidar and image data.

Resolution III.2: Automated Interpretation of Range and Image Data

The Congress:

Noting

- the advancement in knowledge representation and statistical modelling as well as learning of complex phenomena,
- especially the increasing use of stochastic grammars, Markov-Random Fields and Bayesian and Causal Networks, and
- the availability of huge volumes of range and image data and data streams at all scales.

Recognizing

- the need to increase the efficiency of topographic mapping, high-resolution 3D city modelling and land use mapping at all scales without intensive human interaction
- the increasing overlap of interpretation methods used for terrestrial, aerial and satellite data and data streams.

Recommends

- the intensification of the development of theoretically well founded tools for interpreting range and image data,
- increasing the cooperation with the pattern recognition, computer vision and robotics communities
- fostering research on object detection and scene analysis for range and image data at all scales, in conjunction with Commissions V and VII.

Resolution IV.1 Spatio-temporal Data Models and Image Databases

The Congress:

Noting

- the increased need for data models to support complex and consistent data querying and updating;
- the significantly increasing acquisition of high spatial, spectral and temporal resolution digital images combined with archives of historical imagery;
- the availability of many of these images as geographically organised web-based Digital Earth representations and dynamic image databases linked to global knowledge archives.

Recognizing

- the enormous potential of high-resolution images for the automatic generation, refinement and maintenance of updated geospatial databases;
- the need for increasing the level of automation in 3D and 4D geospatial data processing in order to take full advantage of the images;
- the need for constantly monitoring the Earth surface to better cope with global climate change, human impacts, infectious diseases, and other societal issues and environmental challenges.

Recommends

- intensification of research using high resolution images for updating of geo-databases
- development of models for efficient management of spatio-temporal information;

- development of innovative methods for creating, accessing, indexing, and analyzing spatio-temporal image databases, including spatial data mining, object-based image analysis and open source.

Resolution IV.2 Geospatial Data Representation and Context-Aware Visualisation and Analysis

The Congress:

Noting

- the increasing interest in research in conceptual/semantic aspects of geospatial information science for building true 3D and 4D geo-databases;
- the remarkable advances in geo-visual analytics, software and hardware for processing, management, visualisation and analysis of land, ocean, atmospheric and urban models;
- the tremendous interest in planetary processes that builds on successes in extraterrestrial mapping.

Recognizing

- the need to apply geospatial information science concepts in data representation, context-aware visualization and analysis of Earth/planetary landscape, seascape and atmospheric models;
- the necessity to create interoperable standards in order to support all graphic device interface (GDI) developments;
- recent trends in pervasive and ubiquitous geo-technology for locational and context-aware mobile services.

Recommends

- To extend research in 3D/4D Modelling and representations towards integrating dynamic phenomena (e.g., 4D physical processes, noise, wind, pollution) with Earth/planetary surfaces and objects (man-made and natural);
- Continuing research on data management and models for dynamic and context-aware 3D/4D visualisation and analysis complementing geo-visualisation aspects of Commission II.

Resolution IV.3 Integration and Harmonisation of Heterogeneous Data

The Congress:

Noting

- the increasing importance of geospatial data as a common base for integrating diverse and heterogeneous data from different sources and disciplines;
- the increasing need for geospatial data in time-critical applications such as emergency services, emerging infectious disease, disaster response and recovery;
- increasingly pervasive and ubiquitous geo-technology and geo-information for a wide range of application scales from fine-scale (indoor) environments to global Earth and planetary investigations.

Recognizing

- the need for increasing the level of automation in geospatial data processing in order to take full advantage of images/spatial data of earth and other planets;
- the need for better management and analysis of all types of data;
- the need to thoroughly understand the advanced concepts of geospatial information science in order to successfully apply these concepts in practical work.

Recommends

- coordination with Commission II on the development of ontologies in different domains;
- harmonisation of data sources, particularly image, CAD, Architectural Engineering Construction (AEC), Building Information Modelling (BIM), topographic data and biological/physical data, for global processes and emergency response;
- increased research on use of multi-dimensional data models for management of dynamic heterogeneous data, in cooperation with Commission II.

Resolution IV.4 Geospatial Data Cyber-infrastructure

The Congress:

Noting

- the increased awareness of, and demands for geospatial information by governments, industry, academia and society;
- recent advances in the integration of imagery, GIS data and ground data for web-based 'virtual globes' ;
- the increased demand for and support of open and geospatial standards by professionals and vendors;
- the maturing of geospatial database management systems;
- advances in cyber-infrastructure network and communicating technologies.

Recognizing

- the developments at national and international level related to harmonisation of geospatial data and the construction of spatial data cyber-infrastructures such as GMES and INSPIRE in Europe, UNSDI and Digital Earth initiatives;
- emerging international efforts to coordinate and increase the awareness of global Earth monitoring systems and initiatives such as GEOSS;
- international activities for standardisation of service, system architectures and geospatial information such as those from ISO and from OGC.

Recommends

- contributing towards international efforts (INSPIRE, GMES, UNSDI, Digital Earth) and towards standardisation of geospatial information (e.g. ISO, OGC);
- further development of server-based, location-based, Internet centred, distributed and federated architectures for geospatial services and analysis;
- intensification of research on knowledge-based systems to facilitate the transition from data-centred to human-centred applications.

Resolution IV.5 Geo-sensor Networks

The Congress:

Noting

- the increasing availability of small sensors collecting and analysing spatial data in a collaborative way;
- the increased maturity of such sensor networks in terms of battery power, communications and miniaturisation ;
- increased interest in real-time monitoring of dynamic phenomena and moving objects;

Recognizing

- the potential of such sensor networks to solve relevant geospatial problems;
- The need to better understand the different aspects of geo-sensor networks to fully exploit their potential.

Recommends

- the study of geo-sensor networks including their use in dynamic scenarios;
- investigation of efficient ways to visualise and analyse the resulting often unconventional data streams;
- investigation of data models for dynamic management, analysis and archiving of sensor data.

Resolution V.1: Terrestrial Laser Scanning, 3D Imaging and Point Cloud Processing

The Congress:

Noting

- the development and rapidly expanding sales of terrestrial laser scanner instruments,
- the growing market of optical-triangulation-based surface measurement systems,
- the advent of novel 3D cameras;

Recognizing

- the lack of suitable software tools for efficient 3D point cloud data processing,
- the potential of the complementary nature of 3D point cloud and 2D image data,
- the lack of understanding of the accuracy behaviour of laser scanner and 3D cameras;
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Recommends

- intensification of efforts in the field of terrestrial laser scanner geometric Modelling
- development of automatic point cloud processing techniques and integrated point cloud plus image processing techniques,
- further investigation of accuracy issues and development of integrated sensor fusion self-calibration techniques.

Resolution V.2: Image Engineering

The Congress:

Noting

- the great potential of photogrammetric measurement techniques in industrial design, production and quality control processes as well as in robotics;
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Recognizing

- the importance of automation, reliability and accuracy in all phases of on-line or real-time data processing chains,
- the necessity to achieve 99.9+% reliability in industrial applications of photogrammetric techniques;
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Recommends

- continuing strong focus on image engineering techniques in optical metrology,
- consolidation of the leading role of ISPRS in sensor technology evaluation, sensor Modelling and calibration,
- continued adoption of new types of sensors such as omni-directional systems, 3D cameras and multi-ocular systems.

Resolution V.3: Cultural Heritage, Virtual Reality and Animation

The Congress:

Noting

- the continuing demand for close-range photogrammetric techniques and spatial information systems for recording, mapping, 3D Modelling and visualization of structures of architectural significance and objects of importance to the cultural heritage,
- the potential of photogrammetric techniques for the creation of high quality 3D models from real scenes and real-world objects and for 3D motion data capture;

Recognizing

- the need for efficient technologies for imaging, data processing, Modelling, visualization, archiving and information management,
- the need for an evaluation of the quality of the 3D models to traceable standards,
- the market potential of location-based services;

Recommends

- promotion of innovative technologies in the recording, data processing, information management and development of new products in support of archaeology, architecture and conservation through the use of 3D object modelling, VR and animation;
- definition and application of traceable standards and quality evaluation procedures of the resulting 3D models ;
- consolidation of activities in mobile mapping and location-based services.

Resolution VI.1 Education and Training

The Congress:

Noting

- the relevance and importance of training and education for the ongoing development of the photogrammetry, remote sensing and spatial information sciences, especially in the developing world;
- the benefits of and the need for education networking and sharing of expertise and resources;

Recognizing

- the need to enhance communication between education institutions and individual educators in all regions of the world;

Recommends

- intensification of cooperation with Regional Members of ISPRS, sister societies, and non-governmental organizations to promote educational activities and pursue the development and maintenance of educational web portals;
- support for the efforts of UN and other organizations in the delivery of training opportunities and capacity building in developing countries;
- continuation of education and training efforts in primary and high schools, basic vocational courses and universities at all levels.

Resolution VI.2 e-Learning

The Congress:

Noting that

- e-learning includes but is not limited to computer-based teaching, web-based learning, virtual classrooms and distance learning;
- e-learning offers new opportunities and benefits for the education and training processes;
- e-learning courses will help participants from the developing countries in capacity building and technical training

Recognizing

- information technology is increasingly used in the support of education and training, both for on-site and distance learning;
- it is often difficult to find information on existing courses;
- partnerships are a key characteristic of e-learning that can assist education institutions to share knowledge and good practice and avoid duplication of work.

Recommends

- an evaluation of existing and new developments in e-learning;
- the encouragement of development and use of innovative multimodal techniques including multimedia visualization;
- continued development of public domain educational software and web pages;
- support for coordination of initiatives to advance e-learning activities;
- continuation of the computer-assisted teaching contest (CATCON).

Resolution VI.3 International Cooperation and Capacity Building

The Congress:

Noting

- the shortage of qualified academic and professional staff in the developing world against the background of rapidly developing technology and applications;
- the limited resources and the inadequate institutional environment in the developing world to build capacity and attract and maintain qualified academic and professional staff.

Recognizing

- the need to enhance the theoretical, practical and management skills of individuals in the developing world;

- the principle that enhancing such skills should preferably take place in the developing world;
- the need for international cooperation in building the capacity in the developing world through knowledge development and transfer

Recommends

- the pursuit of international cooperation among scientific and professional organizations, both the developing and the developed world, and within the developing world
- that such international cooperation preferably be within the framework of international initiatives such as GEO and the Joint Board of Geospatial Information Societies;

Resolution VI.4 Promotion of the Profession to Students and Young Scientists

The Congress:

Noting

- the alarming decline in the number of students as a cause for concern for the viability of the profession and the availability of graduates who form the future core of ISPRS.
- the increasing possibilities for student mobility between institutions during their education and training.

Recognizing

- the need to promote relationships between professionals and high school students in order to improve recruitment of new professionals for the photogrammetry, remote sensing and spatial information sciences.

Recommends

- active promotion and integrate of young people, especially University students, into ISPRS activities;
- active promotion of ISPRS Youth Forum and Student Consortium
- encouragement of relevant organisations to facilitate international student exchange and technical training programs at all levels
- participation of the Student Consortium in outreach activities at all levels.

Resolution VII.1 Information Extraction from SAR and Other Image Data

The Congress

Noting:

- the new trend in remote sensing, especially for tropical areas, other cloud covered regions and high latitude areas, represented by rapid developments in satellite SAR technology,
- the launch of an increasing number of high resolution SAR satellite sensors

Recognizing

- that more SAR research is essential for the optimum use of such data and the rapid development of application technologies

Recommends

- increased research on information extraction from SAR data, especially in new domains such as polarimetric SAR, interferometric SAR (InSAR), differential InSAR (D-InSAR), and persistent scatterer InSAR (PS InSAR)
- increased research into fusion of SAR data and other types of image data such as optical and hyperspectral.
- increased cooperation with other institutions and societies engaged in such research

Resolution VII.2 : Multi-temporal Analysis and Change Detection

The Congress

Noting:

- the changes in urban areas, environment and Earth's climate
- the increased number and variety of high, and medium resolution active and passive satellite-borne sensors

- the requirements to integrate and fuse disparate data types
- the need for sensor inter-calibration,
- the limitations of single sensors for sufficient feature extraction for change detection studies
- the growing archives of satellite data

Recognizing:

- that retrieval of quantitative parameters from these sensors and derived measurements is essential to understand and model the various phenomena
- that methods for thematic data extraction, fusion and classification, using such advanced data sources are far from operational,

Recommends:

- further development of enhanced change detection and fusion algorithms to take advantage of these multiple data sources and archived data-sets
- development of standards for such procedures.
- further research on the accuracy/reliability of such methods to increase confidence in the resulting information.

Resolution VIII.1: Monitoring Changes of Land Use/Cover, Ecosystems and Biodiversity

The Congress:

Noting

- that significant contributions made by remote sensing Earth observations and technologies facilitate the mapping, inventory and monitoring of land-use/cover, ecosystems and biodiversity
- the need for crop inventory, soil mapping, land degradation studies, water resource mapping
- the contributions made by GI-sciences and space community in disaster monitoring, mitigation and damage assessment.
- the worldwide rapid, unplanned urbanization;

Recognizing

- that agricultural remote sensing research is mostly limited to studies of different aspects in isolation;
- that efficient and sustainable use of water resources is a priority for the world.
- the benefits of remotely sensed data in monitoring the impacts of urbanization.
- the importance and vulnerability of ecosystems and conservation of biodiversity
- the improved spatial, spectral, and temporal capabilities of new sensor technologies
- that disaster management and environmental safety have been recognized as a priority issue in different UN agencies such as OCHA (Office for the Coordination of Humanitarian Affairs), WFP, UNHCR, UNOOSA, FAO and UNDP

Recommends

- continuation and enhancement of the use of remote sensing and GIS and development of procedures and models for the attainment of agriculture and water sustainability and security; for inventorying, monitoring and conservation of forest resources and biodiversity; and for disaster early warning, monitoring, damage assessment, and mitigation.
- continuation of the monitoring of land use and land cover transformation, with special emphasis on urban growth and human impact.
- continuation and enhancement of cooperation with such partners as CEOS, UNOOSA, UNESCO, WFP, GEO, Geo-societies and other related organizations.

Resolution VIII.2: Atmospheric, Weather and Climate Change Studies and Forecasting

The Congress:

Noting

- that many measurements pertaining to the atmospheric constituents and profiles are available from a network of space and in-situ systems
- the relationship between global climate and environment changes
- the major initiatives leading to significant new insights into global processes and the decades of

valuable polar research, including the Kyoto Protocol and 2007-08 IPY;

Recognizing

- the continuous need for understanding various atmospheric processes and the global environment;
- the need for both short-term and long-term weather forecasting.
- the fundamental importance of the global environment, and the role of polar regions in its preservation;
- the need to monitor air pollution;
- the capability of remote sensing technologies in providing valuable inputs to polar research in an unbiased manner;

Recommends

- further use of climate observing systems and development of long-term records for weather and climate Modelling and forecasting, to improve the analysis of the impact of climate change.
- monitoring of and research into air pollution
- development of strategies, methods and algorithms for integrating remotely sensed data in the research and monitoring of the cryospheric regions
- continuation and enhancement of collaboration with GEO, GEOSS, IMO

Resolution VIII.3: Human Health and Environment

The Congress:

Noting

- that changes in the natural environment can impact human health
- the link of environment to certain diseases
- that diseases resulting from both infections and pollution are re-emerging in their former ranges
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Recognizing

- that remote sensing provides timely Earth observation environmental data
- the need for environmental data for health studies and disease prevention
- that Earth observation data can improve environmental models to enhance decision support and early warning systems
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Recommends

- integration of Earth observation products with enhanced predictive Modelling capabilities for early warning and surveillance of environmental impacts on human health in cooperation with other international, national, and regional organizations and activities
- collaboration between the Earth observing communities and the public health communities
- participation of ISPRS in the ICSU initiatives including the GeoUnions Health Group and the Science for Health and Well-being (SHWB) Initiative

Resolution VIII.4: Management and Security of Energy and Natural Resources

The Congress:

Noting

- the importance of exploration and exploitation of energy and the need for energy management
- the environmental impacts of energy production and consumption
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Recognizing

- the extensive use of remote sensing data and technologies in the exploration and exploitation of natural resources
- the urgent need for protection of natural resources and energy supplies
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Recommends

- the study and investigation of the use of remote sensing data and technologies in the management of energy and natural resources, and in determination of the potential of renewable energy sources
- investigation of the environmental impacts of energy production and consumption