GPS　　　　　　　　　1　10 000

430071

GPS

GPS　　　　　　　　1　10 000

GPS

$$z=a0+a1 \times dB+a2 \times dL$$

$$z=a0+a1 \times dB+a2 \times dL+a3 \times dB^2+a4 \times dL2+a5 \times dB \times dL$$

H

$dB=B$　$B0$　$dL=L$　$L0$　$B0=1/n$　B　$L0=1/n$
L　n　GPS　　　　　　　　　　　　　GPS

z

Hg

Hr

hg

$H =Hg+hg$

,　　z

$H=Hr+z$

1　GPS

GPS

1.1

$$zi=a0+a1 \times dBi+a2 \times dLi+a3 \times dBi^2+a4 \times dLi^2+a5 \times dBi \times dLi$$

m　　　　　　　　　　　　m

$$z1=a0+a1 \times dB1+a2 \times dL1+a3 \times dB1^2+a4 \times dL1^2+a5 \times dB1 \times dL1$$

$$z2=a0+a1 \times dB2+a2 \times dL2+a3 \times dB2^2+a4 \times dL2^2+a5 \times dB2 \times dL2$$

...

$$zm=a0+a1 \times dBm+a2 \times dLm+a3 \times dBm^2+a4 \times dLm^2+a5 \times dBm \times dLm$$

$$V=Ax+L$$

$$A=\begin{bmatrix} 1 & dB_1 & dL_1 & dB_1{}^2 & dL_1{}^2 & dB_1 \times dL_1 \\ 1 & dB_2 & dL_2 & dB_2{}^2 & dL_2{}^2 & dB_2 \times dL_2 \\ 1 & dB_m & dL_m & dB_m{}^2 & dL_m{}^2 & dB_m \times dL_m \end{bmatrix}$$

$x= [\zeta_0, \zeta_1, \zeta_2,... \zeta_n]^T$

$V= [a_0\ a_1\ a_2\ a_3\ a_4\ a_5]^T$

$$x=- A^TPA^{-1} ATPL$$

P　　　　　　　　　　　　　　GPS

$z=a0$

1.2

                                                                                                        3   GPS

                                                                                                                3   3

                                  1dm

                                    1: 10 000

                                                  3   GPS   1   10 000

        1   GPS   1   10 000

                                                  GPS   2   GPS

                                                                                                          2

            GPS   GPS

                                                                    3.1

                                          GPS   1   10 000   146   34

                                                    88   24   1980

        2   1985   GPS   15

                        1   1   6   197

                                                              435

        3   3   70 km

                              6   6   60 km   4 200 km²

        3   4   LEICA-200GPS

                GPS   10 mm+2 × 10⁻⁶d (km)

                                                        40 min

                                                                    GPS

                                                        21

2   GPS

                GPS   GPS   7

                        GPS   7

                WGS-84

                        GPS   ,   1

                                              l   /m

	1	2	3	4	5	6	7
	-0.009	-0.093	-0.028	-0.023	-0.027		-0.025
	-0.437	-0.381					
	-0.096	-0.326	-0.455				-0.238
	…	…	…	…	…	…	…
Mo	± 0.224	± 0.249	± 0.317	± 0.186	± 0.095	± 0.464	± 0.175

3.2

            1   10 000   188   15

        67   96   10

1980   1985   GPS

        GPS   GPS   9   9   6   3

6

18

,　2

2					/m	
1	2	3	4	5	6	
	-0.201		-0.271			
		-0.003	-0.022	-0.101		
0.167		-0.189			0.197	
…	…	…	…	…	…	…
			± 0.186			
Mo						

4

2　　　　　　　GPS

7　　　　　　　5

0.25 m　2　　　　　　　　　　0.50 m

0.25 m　2

1　5 000　1　10 000

1/10

0.50 m　1 m　　　　　　2　GPS

1　10 000

1　　　　　　　　　　　　　GPS

2

1　50 000

3　　　　　　　　　　　　　　　　　1　2

10-15

4

5　GPS

GPS　　　　　　　　　　　　　　E

6

2

5

GPS　　　　　　　　　　　　　　　　　　2

GPS　　　　　　　　　　　　　　　　1　10 000

1　10 000

GPS

GPS

1　10 000

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Innovative Thinking Change Cartography by WANG Jiayao

Abstract   With the development of society and technology, the cartography has undergone dramatic changes and now it is continuing, and this should be the promotion of human innovative thinking. This article discussed the innovative thinking of changing cartography from eight aspects, and it was this innovative thinking make the cartography, a traditional discipline which had a long history, remain vibrancy, and the the traditional cartographic techniques had been replaced by the digital cartographic technology, and now it was transforming to the information cartography which based on the integrated service of geospatial information. The development history of cartography showed that the Innovative thinking is essential.
Key words   Innovative thinking, Map, Cartography Page:1

Study on HBCORS Operation Management Mechanism

by HE Baoguo

Abstract   Continuously operating reference station (CORS) is a GNSS based realtime kinematic, high precision positioning, Hubei Continuously operating reference station (HBCORS) were design and construct by Hubei institute of surveying and mapping, the system provides a new method for modern positioning applications. HBCORS supports multiple broadcasting formats which are used for different areas of applications, such as urban design, land management, environmental monitoring, disaster management and traffic management. This article introduced HBCORS daily maintenance issues, to provides professional suggestions.
Key words   CORS operation management mechanism, geomatic surveying coordinate system Page:6

Discussion of Digital City Construction Modes

by WANG Hua

Abstract   Digital City Construction is a huge investment, long-term, complex system engineering. Without scientific planning, Digital City construction mode will lead to enormous waste of resources, lack of stamina, and other development issues, resulting in irreparable losses. According to the current construction situation of Digital City at home and abroad this paper discussed several construction modes of Digital City from both theoretical and practical aspects in-depth, and focused on the specific content, theoretical scientificalness and practical feasibility in of the mode based on Digital City Geospatial Framework.
Key words   Digital City construction modes Digital City Geospatial Framework Page:9

Inquiring and Distributing the Archives of Surveying and Mapping Based on WebGIS by LI li

Abstract   The management model of archives for surveying and mapping is synchronously constructing with the surveying and mapping informatization system.The quantity of archives for surveying and mapping is massive.Going on this premise to insure the security of these data,we had built the integrated system to inqurie and distribute the archives for surveying and mapping. This system would satisfy the concurrent queries to the multi-user. This system was based on the WebGIS,and had some funtion such as online integrated inqurie,online application,online authorization,online distribution to the data,browsing the map and operation to the map.Ours aim is what anyone in the production department can download the archives' data at any time.This system had promoted the service efficiency,Improved the service abilities, and Increased the service level.
Key words   WebGIS, GIS, archives of surveying and mapping, service, inquiry, distribution Page:13

Research on Virtual Destuffing Based on OGRE Rendering Engine

by HU Shengwu

Abstract   The system provided a rendering engine based on OGRE virtual dismantling of the method and implementation of three-dimensional virtual simulation. Three-dimensional model of virtual assembly software used MFC, ActiveX components to achieve three-dimensional rendering. Interface was responsible for assembling three-dimensional model of software configuration files needed, the model name of the file passed to the three-dimensional model assembly software, 3D model display assembly software responsible for loading the software. Loaded in its three-dimensional model, the interface could access the 3D rendering capabilities, access to its internal data. At the same time three-dimensional space could operate any component of a model. Finally, modify the frame of the model components for each key position and rotation information, automatically generate the transition frame animation, to achieve the final animation recording and playback functions.
Key words   Virtual disassembly OGRE rendering engine three-dimensional model Page:16

Application of the High-resolution Satellite Images in the West-east Coal Conveyance Project by YAN Haiying

Abstract   Focus on the difficulties of the aerial photography in Xinjiang autonomous regions border special aera, this artical firstly briefly introduced the using of the high-resolution GeoEye-1 satellite image's character, then a technology implementation program which using a minimum control points as well as meeting the basical mapping requirements was proposed.
Key words   high-resolution satellite images GeoEye-1 west-east coal conveyance implementation program Page:19

Data Processing and Precision Analysis of the Second Grade Level Net in Nanning by ZENG Xiangxin

Abstracts   The Second Grade Level Net in Nanning were described in this article. The precision results of the Second Grade level better met regulatory requirements through the data processing and precision analysis. It not only provided the basis for a variety of vertical control survey in the city ,and can be used to determine the regional centimeter geoid.
Key words   control datum , level network , layout , implementation Page:21

Fuzzy Comprehensive Evaluation of Underground Gas Pipeline Risk Based on 3DGIS by LIU Xingquan

Abstract   The evaluation of the risk of underground gas pipeline can provide effective decision support aid. It is crucial to the establishment of a comprehensive safety evaluation and management system for the urban underground gas pipeline. This paper present a method of GIS-based fuzzy comprehensive evaluation on underground gas pipeline risk and elaborates the flow of fuzzy risk evaluation in detail. Meanwhile, a fuzzy comprehensive evaluation model was built herein by analyzing the pipeline risk factor weight by means of analytic hierarchy process according to the fuzzy evaluation matrix for relative single-factor membership. Finally, a fuzzy comprehensive evaluation with test data was made on the failure to research the regional gas pipeline issue, the relative risk value of the pipelines in the area was calculated and visualization was made in 3DGIS scene.
Key words   3DGIS, underground gas pipeline, fuzzy comprehensive evaluation Page:23

Design and Realization of Plug-in GIS Application Framework

by CHEN Honghua

Abstract   Application framework has been a kind of very practical programming specification and design framework on the development of software. Through comparing the advantages and disadvantages of existing three kinds of plug-in exploitation methods, this article used the plug-in application development based on C#, utilized ArcGIS Engine to provide a set of complete embedded GIS component library and tool library, and completed the design and realization of the core of plug-in GIS frame, various functions and platform. The paper implemented GIS integration by utilizing the development advantages of dynamic plug-in loading configuration and the visualization component coordination modeling to construct GIS application fast. The platform is suitable for any GIS application integration and basic development platform related to GIS application (ESRI).
Key words   plug-in , ArcGIS Engine , GIS application framework Page:26

Quality Inspection and Assessment of DEM Based on 1:10 000 Scale DLG

by CHEN Yanli

Abstract   According the new quality inspection and assessment standard for digital surveying and mapping, the methods for process quality control and production quality inspection and assessment for producing 1:10 000 scale digital elevation model based on 1:10 000 scale digital line graphs were been introduced in the article. It was been used to the Guangdong East DEM renew project. The quality inspection contents were across-the-board and the methods are maneuverability and there are propitious to advance quality efficiency and production quality.
Key words   digital terrain model quality inspection quality assessment Page:29

Research on Efficiency Improving for Spatial Data Service

by WANG Lianbei

Abstract   Based on the present situation and characteristic of spatial data service technologies, technological approaches for efficiency improving were discussed in this paper. The efficiency improving strategy was presented based on Grid FTP Services. A load balancing algorithms which distributed data block onto nodes in data service cluster according to their current performance was designed and applied on spatial data service experiment. The result demonstrated that the efficiency improving strategy presented in this paper can improve the efficiency of data distributing.
Key words   spatial data, data service, distributing efficiency, load balancing, Grid FTP Page:32

Application of GPS Fitting Height to 1 :10 000 Control Measurement in Mountain by FANG Yunnong

Abstract　This paper introduced the concept of common height system in the measurement process, GPS elevation fitting method and scope of application. It analyzed and discussed the method of rapid change in the height anomaly area to meet the GPS Fitting Height with 1: 10 000 precision control requirements.
Key words　height system, GPS, aerial photogrmmetry, adjustment, error

Research of CORS Station Stability Monitor Based on Gamit
by　ZHANG Xudong

Abstract　CORS has founded and been maintaining the regional control survey frame and benchmark with multi-station,whose stability are very important to the system.Because of the distances between stations are larger than 40km,common GPS data processing software can not process the data with high precision.Taking Ningbo CORS as example,this paper studied on monitoring the CORS stations'stability with Gamit data processing.
Key words　GAMIT, CORS station, stability monitoring

Construction of TIN and Generation of Contour Line on AutoCAD
by　DAI Li

Abstract　The generation of TIN was being analysed. According to algorithm of triangle generation, construct the TIN while based on discrete point in AutoCAD,and generated contour line of arbitrary height the same.
Keywords　Digital Elevation Model Triangular Irregular Network Delaunay triangular network contour line

Application Research of Geographic Information Platform for Public Emergency Services in Hubei Province
by　NIE Xiaobo

Abstract　Summary of the provincial emergency response system, the basic geographic information platform needs, explained how digital space-based information infrastructure, used of the network geographic information system technology (WebGIS) to integrate basic geographic information resources and the resources of public emergency project to build provincial Public Emergency Services Geographic Information Platform's overall design and technical implementation.
Key words　emergency platform, public emergency incident, WebGIS, public safety

Application of AutoCAD and Surfer to the Contour Drawing
by　ZHAO Fang

Abstract　This paper described the significance of contour and the principle of Surfer drawing. Details of the use of Surfer and AutoCAD combined contour drawing methods and procedures. Because of its accuracy and rapidity, it improved the graphics quality and efficiency.
Key words　Surfer, AutoCAD, contour, coal mine, Map

Design and Application of Decision Support System for Negotiation and Delimitation of National Boundaries
by　LIU Hehui

Abstract　The negotiation and delimitation of national boundaries is an important and complicated problem. This paper discussed and introduced the design of functional modules and the system data design based on the spatial analysis technology of GIS, after analyzing the business process of the negotiation and delimitation of national boundaries. And this system could effectively manage data, and provided the tools for auxiliary delimitation and resources evaluation.These provide effectual support for the negotiation and delimitation.
Key words　negotiations and demarcation of national boundaries, ArcGIS Engine, documents directory tree, auxiliary demarcation, document database

Design of Drawing Documents Information Management System Based on ArcIMS
by　WANG Xianpu

Abstract　This paper researched desing and development of drawing documents information management system, introduced ArcIMS and this system framework, functional design, database design,especially introduced attribute table design.
Key words　drawing documents sharing, ArcIMS, database design

Accuracy of Real-time Range Assessment for CORS
by　LI Bo

Abstract　An assessment method for the accuracy of near real-time range was proposed based on the pseudo range observation equation and the character of the CORS stations, and then the key problems of that were expounded in detail. In addition, the performance and adaptively were demonstrated base on real GPS data and the result gave the confidences that the assessment could be used in practical successfully.
Key words　CNSS, CORS, accuracy

Establishment Website Dedicated on Government Administration GIS Platform
by　WANG Yiqin

Abstract　Taking the Subject of Geographic Information System (GIS) on fundamental realities of Yunnan under the program of "Public Access Spatial Information Platform on South Asian Association for Regional Cooperation (SAARC) in South East Asia regional cooperating China (Yunnan)-EASAN Free Trade Zone as a case, this paper introduced methodologies on home page development of GIS platform, including page layout, information structuring, map service call up. Methods for web page items control as well as its application prospect were discussed in detail, which hopefully is of reference value for the development and application of similar function for government administration GIS platform.
Key words　government administration GIS, web page control, digital information tree, map service

Transformation Program and Precision Analysis between Geodetic Coordinate and Gauss Plane Coordinate
by　XU Lei

Abstract　The paper gained formula that adopted computer computation based analyzing transformation formula between geodetic coordinate and Gauss plane coordinate. It adopted method that programs many subprogram and realized transformation between geodetic coordinate and Gauss plane coordinate, programs to realize transformation Beijing 54 coordinate ,Xi'an 1980 coordinate, 30 band Gauss plane coordinate and 60 band Gauss plane coordinate. The paper analyzed precision about transformation results, drew a conclusion that it can meet ordinary production use adapting the transformation program, but there was a little error.
Key words　Geodetic coordinates, Gaussian Cartesian coordinates, coordinate transformation, precision analysis

Application of Several Models to Plane Coordinate Transformation
by　YAO Chaolong

Abstract　Aiming at the coordinate transformation between two 2D coordinate systems, diffrient accuracies from diffrient models will be achieved.This paper utilized the program to compare the accuracy of four-parameter model, six-parameter model and second-degree polynomial model.Results from testing showed when reasonable choose transforming points, the accuracy of second-degree polynomial model is better than the accuracies of four-parameter model and six-parameter model in 2D coordinate transformation.
Key words　plane coordinate systems,coordinate transformation,conversion model, transformation accuracy

Change Detection Based on Aviation Remote Sensing Image
by　XV Xiaoqin

Abstract　In this paper, the change detection methode of utilizing aviation images' grey level difference and ratio was mainly studied.In order to analyse this two kinds of methods, a group of aviation images taking farmland as main landscape of the whole view was measured.According to the result of experiments presented by the form of black-and-white pictures, while relatively choosing different threshold value, these two kinds of methods were compared, especially in the use of detecting the result through the change of this specific goal of farmland, and the combination of the two methods was applied as a final result.
Key words　grey level difference, grey level ratio, change detection, aviation image

Research on Space Road Network of Kaifeng Based on the Model of Space Syntax
by　XU Chong

Abstract　The model of space syntax analysis is an objective method of analyzing road network. This paper analyzed the accessibility and the spatial distribution of accessibility regional of Kaifeng with the analysis functions of Arcview and ArcGIS. And then discussed the problem of Kaifeng road network and give some improvement measures.
Key words　space syntax space road network Kaifeng

Quality Evaluation Methods of Large Scale Digital Map Before Import into Database
by　LI Xuanrui

Abstract　Firstly, the importance of quality evaluation of large scale digital map before import into database were introduced. Then the mathematical model and the steps of fuzzy mathematics judgement applied in quality evaluation were given. Lastly, an engineering example was given to verify the feasibility of the method, this method can ensure the quality of large scale digital map before import into database.
Key words　large scale digital map, quality evaluation, fuzzy mathematics judgement

L2C Signal and L2 Carrier Data Quality Analysis
by　LI Weijun

Abstract　Based on the IGS tracking station data, the signal-to-noise ratio (SNR) of L2 carrier phase resumed by L2C code was improved obviously, almost close to the SNR of L1 carrier. For different receivers, this paper followed with a study on the multipath and noise levels of C/A and L2C code pseudorange, pointing out for TRIMBLE