ABSTRACT&REFERENCES

APPLIED INFORMATION TECHNOLOGY

WORKING WITH BIG DATA AS INDICATORS OF SOCIO-ECOLOGICAL AND SOCIO-ECONOMIC DEVELOPMENT OF REGION (p. 4-8)

Natalya Shakhovska, Yuri Bolubash

The paper considers the features of socio-ecological and socio-economic data analysis and indicates that they should be processed as Big data. The features of data consolidation process and arising problems are mentioned. The main problems arising during the data processing are the lack of analysis methods suitable for use due to their variety (regional numerical data and geodata, semi-structured reports, etc.), the need for human resources for supporting the data analysis process, high computational complexity of available analysis algorithms and rapid growth of collected data. Information technology was defined for working with regional data. The scheme of data warehouse was designed and the method for predicting the values of regional indicators was selected. Prediction of region development is realized by the time series method based on analysis of previous states of region. Verification of data homogeneity was carried out on the basis of the Irwin criteria. The most appropriate technology for working with regional Big data is data space. Logical model of regional data was designed

Keywords: data space, Big data, time series, geodata, semi-structured data, prediction, ecosystem

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METHOD FOR ENCODING CHARACTERS IN COHERENT OPTICAL CHANNEL OF INTEGRATED TELECOMMUNICATION TECHNOLOGY (p. 8-12)

Viktor Tikhonov

An improved method for encoding characters in a coherent optical channel based on the tensor phase modulation, which extends the range of phase modulation to the total phase circle, was developed. For describing the electric signal at the output of coherent photodetector with quadratic characteristics in the homodyne detection mode the tensor model of optical signals interference on the photodiode was proposed. Based on two orthogonally polarized sub-channels of a single optical carrier, a model of complex transmission channel, which provides a virtual extension of dynamic range of phase modulation, was developed. The improved method for encoding characters with the help of orthogonal harmonics, which are generated by phase modulation, was proposed. Each harmonic spectrum encodes one bit of the character in the ternary code that allows transferring special characters in order to control digital flow in the optical channel

Keywords: coherent optical channel, phase modulation, character encoding, orthogonal radio-frequency spectrum

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OPTIMIZATION OF SYNDROMIC METHOD FOR ERROR CORRECTION IN ADAPTIVE COMMUNICATION SYSTEMS (p. 13-17)

Nikolay Zakharchenko, Matin Gadzhiev, Svetlana Lysenko, Denis Talakevich

Despite the great redundancy of existing methods for information coding for its further transmission over communication channels little attention has been paid to research and development of alternative methods. One of alternatives is using timer signal constructions, allowing to increase the channel capacity more than two times, realize a great number of powerful, allowed for transmission, code constructions with minimum data elements instead of hundreds of elements in redundant position codes. The effectiveness only of those syndromes, which correct displacement errors of one SRI (significant renewal instant), was theoretically and experimentally verified, other code

words, which do not satisfy the quality requirements, are subject to further verification. This method for information coding can be used in existing wire communication channels, thus increasing their capacity. Using of timer signal constructions will increase the channel capacity due to a fundamental change of the method for information coding without increasing the error probability

Keywords: adaptive communication systems, syndrome error correction, timer signal constructions

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METHODS FOR THE ANALYSIS OF DYNAMIC STRUCTURES OF TELECOMMUNICATION SYSTEMS (p. 18-22)

Vladimir Popovskij, Vadim Volotka

Mathematical models of connectivity of the system associated with the network structures for their reliability are considered. For static systems in where the connection matrix consists of the probability characteristics, the rate of the connection is defined as a stochastic estimation. For complex systems, the calculation of this index has the NP-complexity. Therefore, the evaluation of connectivity is calculated from the approximate methods. Such techniques such as assessment Ezary-Proschan and Polesski and others are known. For dynamic systems the connected component is of fundamental importance because it is the mutual coupling between elements of the system ensure the acquisition highly-integrated properties of emergence. As a model of a dynamic system the equation of state of a shaping filter or basic differential model Chebotarev-Agaev is considered. Besides, the latter is adequately reduced to an equation of stochastic approximation, a simplified version of which is used in telecommunication technologies to assess the round-trip time RTT, RED algorithms and others. Evaluation of the status and results of the analysis for the different connections between the elements are presented

Keywords: appreciations, convergence, stability, equation of observations, space of levels

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PROCESSING OF MEASURING RESULTS WHEN CONDUCTING INTERLABORATORY COMPARISONS ON CONDITION OF PRESENCE OF SYSTIMATIC MEASUREMENT ERROR (p. 23-28)

Victoriya Shvedova, Nadia Rudenko

The methods of processing the results of interlaboratory comparisons are described in the paper. The supplementary comparisons for national standards are carried out with the purpose of confirming measurement and calibration capabilities of the corresponding national metrology institutes. The Guideline on COOMET supplementary comparison evaluation does not take into account the presence of systematic error in the results of comparisons. The Guidelines on "Comparisons of groups of instruments for calibration of the same accuracy level" (MI 1832-88) take into account a systematic component of the measurement error, but the results of comparisons are not verified for consistency, which is an objective confirmation of stated uncertainties. Thus, we propose to combine these two methods for objective demonstration of measuring data reliability. To confirm the method selected for processing the comparisons results, an experiment was conducted, comparisons of voltmeters of one accuracy class with higher accuracy class were made. The results of comparisons and their processing by the proposed combined method are given in the paper. Thus, the proposed method allows evaluating the systematic component of uncertainty and its correction, hence, the laboratory comparisons data are recognized as such that confirm given uncertainties

Keywords: comparison, interlaboratory comparisons results processing, systematic error, result correction

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THE CONTROL ALGORITHM PARAMETERS OF THE SYSTEMS RADIO ACOUSTIC SOUNDING OF ATMOSPHERE (p. 28-32)

Volodumur Kartashov, Margarita Kushnir

The physical bases of the frequency adaptation of radio acoustic sounding (RAS) are analyzed. Using of the function and of the bodies of scattering shows the relation between configuration process characteristics of systems RAS and properties of sounding signals. The impact of changes in meteorological parameters on an amplitude of the scattered signal and the accuracy of the measurements are analyzed. Existing methods for controlling the frequency of the probing signal were considered and their flaws were analyzed. A new control method of frequencies acoustic and electromagnetic sounding signals, which provides a basic improvement quality indicators RAS systems has been proposed

Keywords: radio acoustic atmosphere sounding, scattering body, the frequency adaptation, the scattering function

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MECHANISMS AND MEANS OF SOCIAL DOCUMENTED INFORMATION SUPPORT OF SOCIAL COMMUNICATION SYSTEM (p. 33-37)

Iurii Forkun

An import ant part of the development of a set of documents is to create high-quality, meaning full documented in formation of public communication systems documentation that satisfies the needs of both users and experts to support the requirements and development of such systems. Existing approaches to the creation of documented in formation of public communication systems do not involve users and the systems them selves do not use the opportunities for finding, collecting, collating and generation of fragments documented in formation of public communication systems in a hypertext environment, WWW, especially in virtual communities on line. To solve this problem, first make a systematic analysis of DIS and SCS to identify opportunities and potential SCS DIS, which should be considered in two main aspects:

- Analysis of socio-community communication as a mechanism and means of forming SIC;
- Analysis of SIC created social communication community

Keywords: social communication system, documented information support, coordination model, collaborative documentation

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METHOD OF DETERMINING PARAMETERS OF GENERALIZED COMB SCALING FUCTIONS
(p. 38-43)

Marina Polyakova, Alesya Ishchenko

Solving of applied problems often requires determining the boundaries of objects, filled with structural texture, on the image. For determining these boundaries and analyzing the spectral content of structural texture images, the methods for sequential parallel analysis are used. Existing methods for solving these problems cause large computational cost. For conversion with a generalized comb scaling functions, the problem of determining the analyzing function parameters, for their adjusting to a particular type of structural texture, was not solved. Therefore, a method of determining the parameters of generalized comb scaling functions was developed for determining the boundaries of structural texture on the image with a uniform background. The proposed method involves two steps. First, a basic function is constructed - generalized comb scaling function, aimed at determining the boundaries of structural textures with known parameters. Then, the parameters of this function are determined, based on vector representation of two-scale difference equation for the values of scaling function at dyadic rational points. The experiment showed that the proposed method of determining the parameters of generalized comb scaling function is appropriate for use under a noise level on the original image not more than 10 by power, as the values of computed characteristics decrease with increasing noise level. Along with this, their values were as follows: the relative error was 0.23 - 0.34 and the coefficient of correlation with true values of parameters was 0.95 - 0.98

Keywords: comb filter, structural texture, generalized function, scaling function

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MATTERS OF PROJECTS CLASSIFICATION AND RANKING BY APPLICABLE TECHNICAL SYSTEMS
(p. 44-48)

Valentyn Chimshir

Technical systems application extent analysis in implementation of projects of various types has been carried on. Classification feature and its parameters have been identified and ranking of projects has been carried on in accordance with classification feature. As regards projects of social and technological orientation being implemented all the technical systems are proposed to be grouped into three subclasses: universal, specialized and special. Detailed description of classified projects types is provided subject to four criteria: project aim, project budget, project results stability and scale, project results social significance.

A diagram of correlation between types of projects and technical systems has been suggested

Keywords: project management, classification, classification feature, technical system, ranking, projects type, criteria

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DEVELOPMENT OF ORGANIZATIONS COMPETENCE IN PROJECT MANAGEMENT BASED ON GENOMIC MODEL OF METHODOLOGIES
(p. 49-53)

Sergiy Bushuyev, Victoria Rogozina, Juriy Jaroshenko

The paper deals with matrix technology of identification of organizational competencies in project management. Matrix elements are the components of organizational competence in the field of project management and methodology of project management represented in the genome structure. Formalization of matrix competencies model was made within the frameworks of adopted methodologies and scanning method for identifying organizational competencies. The methods for creating effective methodologies for managing organization development projects, assessing organizational competence in the field of project management, forming rational strategies for developing project management methodologies based on genomic model, were studied.

The matrix model and technology of organizational competencies scanning based on applied methodologies, ensuring dynamic development of organizations using the competency approach, were developed. The proposed models represent the development of systems for assessing the competence of project managers, teams and

organizations, developed by the International Project Management Association IPMA

Keywords: matrix technology, organizational competencies scanning, genome of project management methodologies

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DURATION OF CONCESSIONS IN SEAPORTS: EUROPEAN PRACTICE AND CALCULATION ALGORITHMS (p. 53-60)

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As a result of a new law "On Sea Ports", adopted in Ukraine, the prospects of attracting significant investments through the concession mechanism are opened up to the port sector. However, new opportunities require from authorized governmental agencies the skills and knowledge corresponding to international practice, particularly in issues relating to setting the duration of concession contract. In this regard, positive world experience is of particular interest. The practice of European sea ports is discussed and analyzed in the paper, the classification of methods for calculating the duration of concession contracts for the port sector, based on three proportionalities, was developed. Also, a decision plan was developed, allowing to choose the most rational approach to solving this issue, that can be very useful for practical application in Ukraine

Keywords: concession, seaports, duration, exogenous approach

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