

Ivakin Yan.A., Potapychev S.N., Lytaev M.S.

DIGITAL HUMANITIES: GEOCHRONOLOGICAL TRACKING TOOLKIT IN INTERDISCIPLINARY RESEARCH

Geographic information systems are widely used in modern research in the humanities. At the same time, such studies are based on the use of the universal functionality of geoinformation technologies; there is an objective shortage of specialized GIS tools for historical, ethnographic and other research. Geochronological tracking is an example of such a scientific-methodological and software-technological toolkit, specially developed for a certain class of historical problems. This article is devoted to the consideration of the fundamental possibilities and specifics of such a GIS toolkit.

Keywords: geographic information systems, gis technologies, geochronological track, interdisciplinary research based on gis...

Kozlov A.A., Igumnova A.L., Evdokimov V.V., Kondrashov V.V., Konovalov A.S., Maksimov V.V.

PREDICTION OF DEFORMATION PROCESSES OF TECHNICAL FABRICS OF PROTECTIVE PURPOSE

On the example of technical fabric used as the inner layers of protective helmets to protect the human head from injury, the process of predicting the deformation process is considered. The given technique is based on mathematical modeling of the creep process and allows predicting the deformation processes of sewing materials, including deformation-recovery processes of any complexity, with a sufficient degree of accuracy, which gives rise to the technological selection of fabrics that have the specified shock-protective characteristics even at the stage of product design.

Keywords: deformation, creep, viscoelasticity, sewing materials, prediction, recovery processes, technical fabrics

Balonishnikov A.M.

KINETIC ENERGY BALANCE OF POLARIZATION COMPONENTS OF SMALL-SCALE VELOCITY FOR ANISOTROPIC TURBULENCE

A new equation for the balance of the kinetic energy of hydrodynamic anisotropic turbulence is derived from the equation obtained by the author earlier. The equation has a simpler form than in the case of the fast distortion of the Batchelor-Proudman turbulence approximation. The use of the kinetic energy transfer equation for small-scale velocity components for the closure of turbulence is discussed, proceeding from the form of the turbulence spectrum

Keywords: anisotropic turbulence, kinetic energy balance of turbulence, turbulence spectra

Vladimirova L.V.

SOLUTION OF THE MIXED BOUNDARY VALUE PROBLEM FOR THE LAPLACE EQUATION BY THE MONTE CARLO METHOD USING THE "WALKING IN SPHERES" ALGORITHM

The article discusses the solution of a mixed boundary value problem for the Laplace equation using the "walk on spheres" algorithm. The idea of the method is that the use of Green's formula and the mean value theorem allows us to reduce the original problem to finding a solution to an integral equation with a kernel concentrated on a certain sphere lying in the considered domain. As a result, it is possible to organize the process of wandering through the spheres and construct finite Markov chains that start at a certain initial point of the region and terminate at its boundary. On these Markov chains, a special unbiased random variable is assigned, the mathematical expectation of which allows one to obtain the value of the solution to the original problem at one point. Modified algorithms are presented that allow reaching the boundary of the region, and also dispense with the values of the desired function on those parts of the boundary where only its derivative is given. The algorithm is simple in calculations, it is insensitive to the dimension of the problem and to the nature of the boundary of the region. The "locality" of the method allows you to find the value of the solution at one point, while it is not necessary to know the solution at other points. In the process of calculating the solution, you can estimate the calculation error. The slow

convergence of the method can be compensated for by combining it with other methods for solving boundary value problems.

Keywords: boundary value problem, Laplace equation, integral equation, kernel, Markov chain, "wandering over spheres", mathematical expectation

Balonishnikov A.M.

TAYLOR-COUETT TURBULENT FLOW AT VERY LARGE TAYLOR NUMBERS

The article deduces the drag laws for a turbulent Taylor-Couette flow during the rotation of both the outer and inner cylinders at very high Taylor numbers, based on a semi-empirical model of the transfer of the specific dissipation rate of turbulent energy.

Keywords: turbulent Taylor-Couett flow, drag law, very large Taylor numbers

Malyavkin G.P., Shmyrov A.S., Shmyrov V.A.

ON ONE NUMERICAL METHOD FOR CONTROLLED HAMILTONIAN SYSTEMS

A control system is considered that describes the orbital motion in the vicinity of LI, which preserves the Hamiltonian form with a special choice of the synthesizing function of the equation of motion. A canonical displacement mapping along the trajectory is investigated. An approximation of the generating function for such a mapping is constructed, which makes it possible to form an iterative scheme describing the motion of the controlled system. The proposed method is compared with one of the widely used methods of numerical integration.

Keywords: Lyapunov stability, generating function, iterative scheme, Hamiltonian, three-body problem.

Shvankin A.M., Egorova M.A., Egorov I.M.

MODELING OF DEFORMATION PROPERTIES OF HEAT-RESISTANT ARAMID MATERIALS

Methods for modeling the deformation properties of heat-resistant aramid materials are considered. The basis for predicting the deformation processes of these materials is formed by mathematical models of relaxation and creep. A technique is proposed for solving the problems of comparative analysis of the properties of heat-resistant aramid materials, studying the relationship between properties and structure, and predicting short-term and long-term mechanical effects.

Keywords: heat-resistant aramid materials, deformation processes, forecasting

Drozdova E.N.

FEATURES OF SOFTWARE IMPLEMENTATION OF INTERACTIVE INTERNET RECEPTION WITH AUTOMATED ANALYSIS OF CUSTOMER QUESTIONNAIRE RESULTS

The article discusses the process of creating an interactive Internet reception (on the example of an interregional distribution network company), which is a dedicated client Internet portal, implemented by means of a web server through the Drupal content management system. The features of the development of a questionnaire module are analyzed, which automates the work of company employees to identify customer satisfaction with the services provided. The tasks of the module for the automated analysis of the results of customer surveys are given. The structure of the questionnaire form is described. The logical structure of the database, created to support the work of the questionnaire module, is considered. The software implementation of the questionnaire module is discussed.

Keywords: e-reference, layout, information model, interface, dynamic website, data entry forms, database

CHEMICAL SCIENCES

Smotrina T.V., Busygin K.N., Smotrin V.A., Zhizhenkov V.V., Kvachadze N.G., Grebennikov S.F., Zaitseva E.I.

MOLECULAR MOTION AND STRUCTURAL CHANGES IN POLYPARAARAMIDE FIBERS UNDER EXTERNAL IMPACT. MESSAGE 2. INTERACTION OF LIQUID CRYSTAL FIBERS WITH WATER.

The stability of LC formations in fibers to the action of an aqueous medium by sorption and NMR methods has been studied.

Keywords: polymer, polyparamide polymers, relaxation times, sorption

Melnikova Yu.V., Myznikov L.V., Artamonova T.V., Vorona S.V., Novoselov N.P., Zevatsky Yu.E.

BARDGELLINI REACTION

This review considers the literature data on the use of the Bargellini reaction in the synthesis of biologically active substances and functional materials, and presents some features of the reaction conditions for various types of nucleophiles.

Keywords: multicomponent reactions, bargellini reaction

Saribekova D.G., Kunik A.N., Kovalenko V.A., Saribekov G.S.

COMPARISON OF THE EFFICIENCY OF APPLICATION OF PRELIMINARY AND FINAL TREATMENT OF FABRIC WITH CATION POLYMERS WHEN DYING WITH DIRECT DYES

The article compares the effectiveness of the use of preliminary and final processing of cotton fabric with cationic polymers KP.2 and KP.3 when dyeing with direct lightfast dyes Direct orange and Direct green. It was found that the most effective is the pretreatment of the fabric with cationic polymers, since this method of dyeing provides not only an increase in color fastness to external influences, but also a significant increase in color intensity, a reduction in dyeing time, and the exclusion of a neutral electrolyte from the dyeing composition.

Keywords: direct dyes, cationic polymers.

Epishkina V.A., Celms R.N., Kiselev A.M., Vasiliev V.K.

ON THE PROPERTIES OF DOMESTIC SYNTHETIC LATEX AND THE QUALITY OF BINDERS FOR PRINTING TEXTILE MATERIALS WITH PIGMENTS

The properties of various synthetic latexes of domestic production have been studied for their use as binders. The possibility of the most effective use of MN-10 acrylic latex in the process of pigment printing of textile materials has been proven.

Keywords: synthetic latexes, aqueous dispersions of acrylic latexes, particle size of latex dispersions, surface tension, aggregate stability, pigment printing.

Sashina E.S., Kitchenko K.A., Golubikhin A.Yu.

OBTAINING SORPTION-ACTIVE PRODUCTS FROM WASTE SILK FIBROIN

The possibility of utilization of silk production wastes has been studied to obtain a sorption-active product. The optimal conditions for the wet-thermal hydrolysis of silk waste have been identified and the sorption properties of the final powdery product, which has the ability to adsorb ions and non-polar compounds of various nature, have been characterized.

Keywords: silk fibroin, waste disposal, sorption material

Kalugina M.S., Mikhailovskaya A.P., Kiselev A.M.

INTENSIFICATION OF THE DYE PROCESS OF POLYAMIDE FIBER MATERIALS

The article presents the results of a study of the intensifying effect of quaternary ammonium salts in the processes of dyeing polyamide fibers with acid dyes using batch technology.

Keywords: quaternary ammonium salts, dye intensifiers, acid dyes, polyamide fibers.

Beloglazov S.M., Zelentsova V.A.

BACTERICIDAL PROPERTIES OF NEW CORROSION INHIBITORS OF STEEL IN THE PRESENCE OF SULPHATE-REDUCING BACTERIA

The bactericidal properties of a number of organic compounds (OCs), which are effective inhibitors of steel corrosion in media containing sulfate-reducing bacteria (SRB), have been investigated on the basis of quantum-chemical calculations. The effect of OS on the number of bacterial cells and the concentration of the resulting biogenic hydrogen sulfide was assessed. The bactericidal action is carried out due to a significant and rapid suppression of the vital activity of sulfate-reducing bacteria

Keywords: Organic corrosion inhibitors, sulfate-reducing bacteria, mild steel, biocorrosion, bactericidal activity.

ORGANIZATION OF PRODUCTION. STANDARDIZATION AND PRODUCT QUALITY MANAGEMENT

Titova M.N., Druzgalskaya N.M., Lyubimenko A.I., Chigirinova M.V.

IMPROVEMENT OF PERSONNEL TRAINING FOR THE ORGANIZATION OF EXHIBITION ACTIVITIES AND SOLVING THE EXHIBITORS' ACTUAL BUSINESS TASKS

The article discusses the conditions aimed at improving the training of personnel in the field of exhibition activities and solving urgent business problems for the industry on the basis of the order of the Government of the Russian Federation of July 10, 2014 No. 1273-r "On the Concept for the Development of Exhibition, Fair and Congress Activities in the Russian Federation and action plan for the implementation of the Concept".

Keywords: exhibition, fair, congress, organization, exhibitor, advertising, information, qualifications, skills, investments, competencies, powers, responsibility, knowledge.

Alexandrov S.P., Shestov A.V.

METHOD FOR CALCULATING THE CONSUMER COST OF THE PRODUCT BY QUALITY INDICATORS

On the basis of market conditions, the relationship between quality indicators and the consumer value of products is considered. For particular indicators of quality, a range of variation is established, the numerical value of a specific indicator in analogs and its consumer value on the market are determined. By calculation, the consumer value of the corresponding indicator of the designed product is found. Economic efficiency is determined by the criterion of the social product of labor

Keywords: quality indicators, consumer value, market analogues, calculation functions, economic efficiency, criterion, social product of labor.

Tereshkina T.R., Treiman M.G.

EFFICIENCY OF USE OF WATER RESOURCES OF ST. PETERSBURG

The article presents data on the state of water use and economic efficiency of the use of water resources in St. Petersburg. An analytical study of the main parameters of water use in the region was carried out: the volume of water consumption and water disposal, water losses. The reasons for the change in water use in the private sector and industry and a decrease in water use, typical for the North-West region, are analyzed, and the features of methods for calculating the volume of surface runoff and their economic profitability for the enterprise GUP Vodokanal SPb are considered. The prospects for the development of the region's possibilities in the field of reducing the use of water resources are assessed.

Keywords: water resources, ecological and economic efficiency, water supply, sewerage.

Pershakova N.A.

FINANCIAL SUSTAINABILITY - THE BASIS FOR THE DEVELOPMENT AND PROSPERITY OF A MODERN ENTERPRISE

The article is devoted to disclosing the essence of financial stability and substantiating its significance for a modern organization. The article also provides the main types of financial stability that can be determined in the process of a simple assessment of the absolute indicators of the enterprise.

Keywords: financial stability, factors of financial stability

Pershakova N.A.

ANALYSIS OF DIFFERENT CLASSIFICATIONS OF FACTORS AFFECTING THE FINANCIAL SUSTAINABILITY OF THE ORGANIZATION

The article touches upon the problems of studying internal and external factors of influence on the financial stability of an organization, and also considers the types and influence of key factors on the stability of the financial position of a modern organization.

Keywords: financial stability, external and internal factors, an integrated approach.

MECHANICS

Mazin L.S., Martynchik K.I., Chizhova E.P.

AMPLITUDE-FREQUENCY CHARACTERISTIC OF WINDING MECHANISM WITH

PARALLELOGRAM TYPE SUSPENSION

The article explores the dynamics of a receiving-winding mechanism with a suspension in the form of a parallelogram using the method of harmonic linearization, in which a friction cylinder and a thread spreader with their electric drives are installed on the lower link; The bobbin holder is mounted in a turret installed in the machine body. The dynamic and mathematical models of the mechanism are obtained. The amplitude-frequency characteristic is built.

Keywords: model, dynamics, harmonic linearization, skeletal curve, line of maxima, amplitude-frequency characteristic.

Tikhonova O.B., Ruslyakov D.V., Larina L.V., Petrosov S.P., Tikhonov A.Yu.

TO ESTIMATION OF ENERGY EFFICIENCY OF A CONTINUOUS DISHWASHER

The article discusses the issues of assessing the operational efficiency of water-jet dishwashers. Dependences of the wash-off of contaminants on the time of exposure to the jet at different temperatures of the washing solution and pressure of the jet at the inlet to the nozzle were revealed. Recommendations for dishwasher users have been developed.

Keywords: dishwasher, operational efficiency, spray effect, washable dirt