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SUMMARY

ENGINEERING GEOMETRY AND COMPUTER GRAPHICS

O. B. Ilyasova
Determination of structural characteristics of varieties of multidimensional space

This article discusses a general algorithm for design of cyclic manifolds by enumerative geometry. The Apolonia task is given as an example.

Keywords: construction, enumerative geometry, cyclic surface.

D. V. Dorkin, M. N. Moskovtsev
Geometric modeling of multi-dimensional objects on the basis of statistical data

This article discusses ways to construct multidimensional surfaces on points in the space that identify optimal conditions of technological processes with the set of independent parameters. The possibilities of its application in conjunction with the identification of risks in the production of various kinds of products are shown. There is proposed a probabilistic approach to solving optimization problems processes of light industry.

Keywords: algorithm, multi-dimensional descriptive geometry, standard deviation, variation, regulation, regression.

D. S. Korchagin
The method of geometric and dynamic forming of non-linear strips

In the article the method of forming non-linear strip is given by the carcass of finite number of generating lines. The aim of the method is the representation of the law of continuous change of parameters of lines of the carcass providing continuous carcass of the surface containing the initial discrete carcass. In the method the correlation between geometry and dynamics of lines is disclosed. This correlation is established through the moments of inertia, centers of masses and central inertia ellipsoids of lines. The example of forming of the surface on the carcass formed by arcs of parabolas randomly oriented in the general system of reference is presented.

Keywords: non-linear strip, directing line, inertia ellipsoid, centre of masses, carcass, moment of inertia.

M. N. Moskovtsev
Program implementation of geometric multi-objective optimization algorithm

This article presents algorithmic description of the developed technique of multi-objective multivariable optimization and its program implementation in the form of class library for Python programming language.

Keywords: program library, multidimentional geometry, multi-objective optimization.

PHYSICAL AND MATHEMATICAL SCIENCE

A. M. Zavyalov
Probabilistic approach to estimation of asphalt concrete thermodynamic condition

The is offered approach to the assessment of thermodynamic condition of asphalt concrete pavement refusing labor-consuming procedure of cutting out and analisys of samples from pavement layer. Implementation of probabilistic approach is economically effective when monitoring a network of highways in the Omsk region.

Keywords: probabilistic approach, thermodynamic probability, entropy.

V. N. Zadorozhny
Optimization of highly reserved non-Markovian queuing networks

Optimization problem of non-Markovian queuing networks with an infinite number of devices on all the nodes are resolved.

Keywords: queuing system, fractal traffic, simulation.

A. I. Blesman, D. V. Postnikov, D. A. Polonyankin, E. A. Rogachev, E. A. Tkachenko
The influence of temperature and internal pressures on life-time of cylindrical symmetry products with protective coating

For selection of an optimum protective metal coating for the cylindrical symmetry products applied by magnetron-method, calculations of the temperature field and internal pressure caused by pressure and non-uniform distribution of temperature under the intensive heat pulse loads are carried out. Optimal coating that satisfies the minimum temperature and the minimum internal stresses is defined and they are the criterion of life-time. Using the results of the calculations, recommendations of using the coatings under the influence of gas environment under high temperature are given.

Keywords: heat-resistant coatings, thermal impulse, blanket structure, nonequilibrium distribution of temperature, thermointense condition.

A. I. Blesman, D. V. Postnikov, D. A. Polonyankin, E. A. Rogachev, E. A. Tkachenko
Mass transfer in the system of steel-metal coating under high temperatures in oxygen atmosphere

The article discusses the mass transfer of carbon steel 905M39 with metallic coatings of tungsten, molybdenum and tantalum. The mechanism

of the point defects evolution under heated to 900 °C is considered. The calculating method of the point defects distribution and the carbon concentration by means of kinetic equations of the mass-transfer is proposed. It allows us to obtain the profile of carbon distribution in the surface layer. A comparison with experimental data is carried out.

Keywords: mass transfer, diffusion, protective coatings, annealing.

A. L. Litnevskiy
The dependence of excited nuclei fission modeling results on values of angular momentum removed by emitted particles

A dynamic simulation of excited nuclei fission process with different values of angular momentum, removed by the emitted light particles is carried out. The dependences of the main observations on the initial angular momentum of fissioning nuclei are obtained. The influence of removed momentum values on the simulation results is explained.

Keywords: nuclear fission modeling, angular momentum.

A. L. Litnevskiy
Excited nuclei fission process: the distribution of emitted light particles by removed angular momentum

The distributions of light particles emitted by fissioning excited nuclei by removed angular momentum are obtained. The factors influences on the average values and dispersions of the distributions are analyzed.

Keywords: nuclear fission modeling, angular momentum.

U. N. Kulbida, O. N. Kaneva, A. V. Zykina
Optimization approach to media planning

The article is devoted to the development of optimization methods for determining the target audience in advertising positioning problem. In the expert system the algorithm for the calculation of cost of the advertising campaign is calculated based on the use of optimization problems of integer programming.

Keywords: media planning, positioning, target audience, the budget of the advertising campaign, optimization problem.

Yu. A. Medvedev, R. K. Romanovskiy
Boundary control of one-dimensional hyperbolic system of equations of thermal conductivity

This article deals with boundary problem that describes heat transfer in one-dimensional homogenous rod in hyperbolic model of thermal. Task of finding thermal mode at the boundaries of the rod (control) that provide transfer from start state (T0, q0) of the rod to the final state (T^*, q^*) is set up. The class of controls that depends on function parameter is described.

Keywords: hyperbolic thermal conductivity, phase vector boundary control, system of Fredholm integral equations.

MECHANICAL AND THEORETICAL ENGINEERING

I. P. Aistov, A. V. Svishchev
Prospective pumping equipment and compressors for process units of petrochemical plants

Pumping equipment for different process purposes operated under various conditions is considered. Hydraulic improvement of these pumps is one way to ensure efficiency and working capacity of pumping equipment. The analysis of scientific and technical literature and patent materials has revealed current trends in development of the pump equipment (gear pump designs), namely, the simplification of the design; ease of maintenance and repair; decrease in overall dimensions, weight, noise and vibration of manufacture; increasing the reliability, service life, mechanical and volumetric efficiency, etc., that allows to raise the technical level of the pumping equipment intended for feeding a lubricating fluid to the sites of friction compressors.

Keywords: pumping equipment, hydraulic drive compressors, hydraulic machine.

P. D. Balakin, A. H. Shamutdinov, D. S. Zvezdin
Experimental study of the dynamic parameters of original part of manipulator with six-degree of freedom

In this paper, experimental investigations of the dynamic parameters of the original part of manipulator with six-degree of freedom: ranges of natural frequencies, resonant frequencies and damping rates of the oscillations of the test layout for the application of its performance in the process equipment.

Keywords: original layout of the manipulator, vibration analyzer «Diana 2M», vibration sensor, temporal realization of free oscillations, the logarithmic decrement of oscillations.

E. N. Bogomolov, V. V. Vyatkov, S. Yu. Yakovleva
About gasdynamic efficiency of air jets supercharging tip clearance of turbofan engine single-stage of high-pressure turbine

This article provides an analysis of the use of air supercharging radial clearance of single-stage turbine turbofan. It is proved that the radial clearance inflating air taken from the intermediate stage of the compressor, not only leads to an increase in turbine efficiency, but also to an increase in specific thrust and reduce specific fuel consumption turbofan.

Keywords: turbofan aviation engine, turbine, radial clearance.

E. N. Eryomin, Yu. O. Filippov, A. E. Matalasova
Research of carbide phases in the alloy GS6U

The structure and composition of carbide phases in the GS6U alloy are studied. The carbides in the metal extent are shown to arrange in the form of plates causing a low mechanical properties of the alloy. An explanation of the reasons for the formation of such morphology carbide phases is proposed. The technique of improving the structure of carbide phases is suggested.

Keywords: heat-resistant nickel alloy, carbide phases, structure, properties.

Yu. K. Mashkov, O. V. Kropotin, O. V. Chemisenko
Development and study of polymer nanocomposite for metalpolymer friction units

There is developed antifriction polymer composite material based on polytetrafluoroethylene. In the complex filler-modifier is used carbon nanotubes and nanosized silicon dioxide providing significant increase in wear resistance of PTFE composites.

Keywords: polymer composites, PTFE, carbon nanotubes, silicon dioxide, wear resistance.

A. P. Morgunov, A. P. Chumakov, E. A. Rogachev
Optimization of turning process of products from heat resistant nickel-chromium alloy

This paper proposes a way of improving the technology of turning process of gas turbine engine parts, rotor shafts, horn-shaped cores, spacers of heat-resistant nickel-chromium alloys such as ZhS6-U ZhS6-K VZHL-12 , EP202 etc.. The requirements to wear of cutting edges carbide inserts incisors are considered. Physical and mechanical properties and chemical composition of tools with carbide inserts with fine grains by GOST 25398-90 are given.

Keywords: heat resistant alloy, tungsten carbide plate, dimensional stability, technological methods, cutting edge, bevel cutter.

F. N. Pritykin, A. Yu. Osadchiy
Definition of space areas of configuration of reachable points of working zone of manipulator on the basis of use of the theory of sets

Areas of space of configurations of reachable points of a working zone of the manipulator setting taking into account position of prohibited zones are investigated. For the analytical task of areas the theory of sets is used.

Keywords: synthesis of movements of robots, configuration space, prohibited zones, intellectual control systems of robots.

V. I. Trushlyakov, K. A. Rozhaeva
System of requirements and criteria when developing mathematical and physical models for improving the quality of research

The concept of a method of improving the quality of design worked out on basis research work «Development of active de-orbiting system for rocket stages with sustainer liquid rocket engine after the mission completion». The obtained results improves the quality of design of complicated technical systems at the stage of research by introducing additional procedures in the development of mathematical and physical models carrying out numerical simulations and experiments, reduce developing time by identification of methodical mistakes.

Keywords: quality, reliability, developing, criteria, assumptions, gasification, active de-orbiting system, physical and mathematical models.

S. G Shantarenko, V. F Kuznetsov, E. V Ponomarev, O. D Yurasov
Calculation methodology of tension in the case of motor and axial rolling bearings

Calculation of tension ispresented in the article in a material of details of bearing unit of electric locomotive 2ES6 and the assessment of its operational reliability is executed. The impact of mass of the traction electric motor, torque, joint roughnesses on the motor and axial bearing is considered. The calculations are to estimate the maximum tension in the material of the case of motor and axial bearings of the wheel and motor block of electric locomotive 2ES6.

Keywords: motor and axial bearing, cases of bearing unit, traction electric motor, tension, contact force.

A. L. Akhtulov, L. N. Akhtulova, I. F. Ivanova, A. V. Leonova
Development of technique of estimation of quality of processes of design-technological preparation of manufacture for complex technical devices

The article is devoted to the analysis, estimation and offers on perfection of process of development of an estimation of quality of design-technological preparation of manufacture of space-rocket technics.

Keywords: space-rocket technics, preparation of manufacture, technique of estimation of quality, management of processes, six sigma.

L. N. Akhtulova, A. L. Akhtulov, N. N. Petukhova, S. I. Smirnov, E. N. Leonov
Model of electropower system of control using properties of ferroelectrics with dim phase transition

The article is devoted to the system engineering of automation of designing on the basis of properties of ferroelectrics in the field of phase transitions. The problem, creations of model of research ferroelectric materials, for revealing its parameters and possible use as components is considered at designing systems of power supplies. The synthesis algorithm of basic schemes of objects of electrosupply is considered to create system of the automated designing in view of detailed elaboration and the basic characteristics.

Keywords: electropower system of management, ferroelectrics, the basic scheme, system of automation of designing, detailed elaboration, the integrated equation.

I. M. Zuga
General algorithm, technique and structure of the system of automated synthesis of layout of objects of industrial complexes

A generalized algorithm technique and structure of the automated synthesis of the arrangements of the object is presented. Synthesis schemes provide possible physical layouts not previously assigned.

Keywords: generalized algorithm, automated synthesis, layout objects.

A. A. Kapelyukhovskiy
A comparative analysis of transport delay approximation in control system of hydrodynamic vibrator

A comparative evaluation of different methods of transport delay approximation when assessing the stability of a system of automatic frequency control emission hydrodynamic vibrator is performed. Orienting by an amount the phase errors the possibility of the application of Pade approximation is done. In the development of system of controlling the emittance intensity hydrodynamic vibrators in order to improve oil recovery the results can be used.

Keywords: enhanced oil recovery, borehole oscillator, transport delay approximation, sustainability of the control system.

V. B. Masyagin, V. P. Pogodaev
Automatic tolerance chart balancing using linear programming

The paper presents new method for automatic tolerance chart balancing. The known methods of tolerance chart balancing are described. The new method includes the step of reducing manufacturing tolerances and the stage of its increasing. The corresponding models of linear programming are formed. The program for automatic tolerance chart balancing is developed. Sample calculation is presented.

Keywords: tolerance chart balancing, linear programming.

D. V. Shabalin, S. V. Roslov, I. Yu. Kilunin, A. A. Smolin
Stabilization of air boost parameters providing optimum values of the factor of air boost surplus in wide range of high-speed and loading operating modes of a diesel engine

The problem of optimum values of the factor of surplus of air boost in a wide range of high-speed and loading operating modes of a diesel engine is considered. It is offered to apply the complex approach consisting in application of the thermal accumulator of phase transition providing stability of temperature of air in a compartment with the inertial store of energy to the task in view decision. As energy store the receiving charge on modes of braking of a vehicle is offered flywheel energy accumulator.

Keywords: compressor, gas turbine, energy storage, flywheel inertia

S. S. Anishchenko, A. Yu. Popov
The method of technological process for multi-purpose equipment taking into account the loss of accuracy

A new concept of equipment operation with the developed technological process considers a set of requirements useful for every technology of detail processing on the multifunction machine. It is found that using the method for new machines it retains high accuracy for much longer time.

Keywords: multi-function equipment, accuracy.

S. S. Anishchenko, A. Yu. Popov
Features of operation of large scale machining centers

A new concept of processing of small parts which is effective on large scale machining centers is considered. It is found that this method significantly reduces the complexity of manufacturing of details. The economic benefit is calculated.

Keywords: machining center, machine-hour, labor-hour, labor input.

I.V. Bozhko
The methodology for selection of scheme and parameters of working body for layered subsurface tillage under low moisture of soil

In the article the scheme and method of engineering calculation of the working body for layered subsurface tillage in low humidity of soil is proposed. A scheme and parameters and the working body are given.

Keywords: engineering calculation, working body, layering tillage, inadequate hydration.

I. A. Bugay, E. V. Vasilev, A. Yu. Popov
Improving the accuracy and performance of profile diamond grinding by forming its surface depending on the scheme when dressing

In this paper we consider dressing of diamond wheels on bakelite base using various tools for dressing. The analysis of the most favorable ways of dressing is done.

Keywords: diamond grinding wheels, grinding, dressing, salting grinding wheels, recovery profile of the grinding wheel.

L. Yu. Volkova
Determination of effective flow section sprayer for diesel by calculation and experiment and its change during the formation of coke

The methods of calculation and nomogram for determining the effective cross section of diesel injection nozzles are presented. It is shown that the formation of coke-section decreases and increases the duration of the spray gun injection. The methodology and the scheme of the stand for the experimental determination of the flow cross section sprayer are developed.

Keywords: spray, orifice, nozzle opening, coke, coke formation causes.

I. Yu. Kilunin, V. V. Kolb, A. A Smolin
Regulation of air supply in turbo-piston engine

The article is devoted to the analysis of regulation of air supply of turbo piston engines, and directed on the improvement of operational characteristics by bypassing the exhausted gases the turbine. The scheme of the way of fall pressure upon release is offered.

Keywords: piston engine, ways of regulation, air supply, the compressor, pressurisation, a diesel engine.

V. V. Kolb, D. V. Shabalin, E. S. Tereshchenko, S. V. Roslov
Increased diesel pickup combination based on the theory of regenerative braking

The article deals with the problem of reducing the combined pickup engines due to the inertia of the turbocharger. To reduce these negative effects of pressurization on the modes of dispersal of the vehicle, the method for increasing diesel pickup developed on the basis of the theory of regenerative braking. As energy storage is proposed to use the inertial energy storage, in the modes of inhibition.

Keywords: compressor, gas turbine, energy storage, flywheel inertia

I. I. Koshukov
Increasing air-tightness of unit valve of fuel equipment

This article is devoted to the technological process of production unit valve of fuel equipment. Great attention is paid to the question of quality working increasing and formation of valve seat packing surface control of unit valve tightness and mechanization of machining process.

Keywords: unit valve, fuel equipment, seat valve, air-tightness.

P. V. Nazarov, E. V. Vasylev, P. E. Popov, A. Yu. Popov
Development of the construction of a special machine designed for rough processing of hard materials

The article examines the influence of the stiffness on the accuracy of machining, the main methods of calculation components and assemblies of machines on the stiffness, is a possible way to improve the rigidity of the machine.

Keywords: rigidity, accuracy, efficiency.

A. M. Smirnov, S. V. Roslov, E. S. Tereshchenko, D. V. Shabalin
The method of diagnosing of the fuel equipment of a high pressure of diesels

The analysis of methods of diagnosing of the fuel equipment of a high pressure is carried out, the main shortcomings of existing methods of diagnosing of the fuel equipment of a high pressure are defined and the diagnosing method according to differential characteristics of fuel feeding is offered. The method has rather low labor input and possibility of application of diagnosing in operational conditions.

Keywords: fuel feeding, fuel equipment, diagnosing, diesel.

A. M. Smirnov, D. V. Shabalin, S. A. Perov, S. E. Dadayan
The efficiency of diesel engines in special conditions

Specific requirements for engines of army vehicles derived from the role played by the interest of BAT under conditions of warfare. The traditional task of the military engine is to ensure the stable operation of the power plant in the special conditions. Under special conditions, you should understand the extreme climatic conditions of the raised dust content, high mountains, etc.

Keywords: motor, low temperatures, and charging air, the turbocharger.

O. P. Supchinskiy, M. F. Kapustyan
Integrated approach in the organization and planning of production processes based on network planning and «cloud computing»

In the article the scheme of the organization of production based on the use of closed cycle of the software is offered: the program «Network Planning», standard tools and Microsoft Office Excel software project management tools «Bitriks24».

Keywords: Network planning, network diagram, critical path, cloud technology.

A. A. Shvarts, A. V. Zubarev, M.V. Ugrenev
The comparative analysis of analytical and numerical calculating methods of spacer force and axial static stiffness rubber-cord joints

The paper presents two calculation method review of the spacer force and axial static stiffness of the double crimped rubber-cord expansion joints as well as comparison results obtained under experimental study.

Keywords: rubber-cord expansion joints, finite element method, spacer efforts, axial static stiffness.

D. A. Shekhovtsova, E. D. Komarov
Mathematical modeling of dynamic systems of hydraulic single shovel excavator in Matlab

The article describes the mathematical modeling of dynamic systems of excavator shovel, which consists of the basis for selection of the design of shovel scheme, select the model of the motion for the system with several degrees of freedom, making three-dimensional drawing in a CAD-system KOMPAS-3D, modeling of mechanical and hydraulic systems in software product Matlab.

Keywords: shovel, the design scheme, the dynamic equation modeling in Matlab.

V. I. Yadrov
Modeling the growth of crack surface under cyclic loading by means of software ANSYS

The technique of modeling the growth of crack surface under the action of cyclic loads is described. There are offered some variants of creation the finite element mesh in the sample. The method for solving symmetric problem using the contact elements is proposed.

Keywords: surface crack, modeling of crack growth, finite elements, contact elements, stress-strain state (NDS).

R. S. Chuykov, A. S. Stavyshenko, S. S. Chuykov
Temperature effects on internal microstrain in SMP from hard alloy tool group WC and TC

In the article the issue of increase of operability of cutting tools with SMP from tool with hard alloys is considered and the most characteristic types of their destruction are called. Relevance of research of the influence of temperature of cutting plates from ITS of group WC and TC on the internal microtension of the 2nd order is proved. The data of radiographic research of samples from hard alloys of group WC and TC at temperatures from 20 to 700 °C is obtained.

Keywords: made cutting tools, internal stress, the tool, firm alloy.

L. A. Shestel, Yu. A. Sayapin, V. A. Sokolov, D. A. Kutashov, A. M. Semenov
The complex of equipment for ultrasonic welding of hull structures of rigid plastics

The equipment for single-point and multi-point ultrasonic welding of hull structures of rigid plastics are considered.

Keywords: single-point welding, multipoint welding, ultrasonic, hull structures, equipment, rigid plastic.

ELECTRICAL ENGINEERING. POWER ENGINEERING

A. V. Zaitsev, E. V. Logvinenko
Cryogenic pipeline optimization

Here is considered the technique of optimization of a rectilinear division for cryogenic liquid transportation for the purpose of decrease in energy consumption. Some numerical results and their qualitative analysis are given.

Keywords: pipeline, cryogenic liquid, optimization, energy consumption

D. D. Ondar
System of autonomous solar-diesel hot water pipeline in the Republic of Tyva

This article describes the combined use of diesel generators with solar power systems to generate electricity and hot water. The scheme of such a system and method of calculation is given.

Keywords: solar energy, solar collector, heat transfer agent, diesel generator, storage tank.

A. P. Starikov, N. S. Kasyan
The effective use of waste heat and cogeneration

The article discusses the most effective ways to use waste heat in energetical, industrial and transport sector. A system using exhaust heat from internal combustion engines with possible application in rail transport is suggested.

Keywords: Cogeneration, recovery, exhaust gas, ICE.

E. A. Stepanova
Processing module as a part of measurement complex of quality of electric power on draft railroad substation

The complex is presented in this article for measurement of quality of electric energy on draft railroad substations for alternating and direct current, witch is designed in Omsk State Transport University. The processing module of a complex, its advantage and functional features is separately considered. The analysis and the review of existing measuring equipment in the field of quality of electric energy is carried out.

Keywords: electric energy, draft substation, measuring complex, current and voltage harmonics, processor, frequency, performance.

A. A. Tatevosyan, B. I. Ogorelkov, A. S. Tatevosyan
Calculation of induced EMF in a loop at relative movement of permanent magnet with different shape of cross sections

In the article the solution of one of the main objectives of theoretical bases of the electrical equipment formulated to reflect in the solution of the feature of designing of new types of synchronous generators in permanent magnets is considered. The need for such generators is defined, first of all, by development of the sphere of small-scale power generation due to emergence in the consumer market of strong magnets

inexpensive and available to use neodymium alloy of NdFeB. The purpose of this work is obtaining the analytical solution for determination of the induced EMF in the round which is in a magnetic field of a permanent magnet with a rectangular and round shape of cross section at its relative movement. Generalization of the received results of research on any shape of cross section of permanent magnet is given.

Keywords: neodymium alloy NdFeB induced by EMF in a round, relative movement, various form of cross section of a permanent magnet.

V. P. Beloglazov, L. V. Beloglazova
The influence of input rate in vacuum-inertial dust collector on collection ash efficiency of Ekibastuz coal

The purpose of this article is numerical experiments to find the optimal rate range of dusty gas flow. For this purpose a geometric model is developed in SolidWorks and the flow behavior is calculated in the program ANSYS CFX. The article presents the problem of relevance that can be seen visually as the boundary and mathematical boundary conditions. Conclusions are included at the end of the article in the form of research results.

Keywords: vacuum-inertial ash collector, ash, speed, high efficiency.

V. R. Vedruchenko, V. V. Kraynov, M. V. Koksharov, E. S. Lazarev, D. K. Kuznetsova
About technical solutions in modernization of transport and marine ICE to use gaseous fuel

Typical circuit configuration for the use as fuel, compressed and liquefied hydrocarbon gases in a gasoline engine are considered. Technical possibilities of using gaseous fuels (as an alternative to the oil) in the transport and marine diesel engines are analyzed. Structures of basic units components of diesel fuel equipment, providing an acceptable operational workflow both efficiency and emissions requirements in accordance with modern standards are analyzed. Requirements for safe operation of marine diesel engines during operation on gaseous fuels are given.

Keywords: natural gas, liquefied petroleum gas, compressed natural gas, internal combustion engine, economic and ecological effect.

A.V. Bubnov, A. M. Dainovich, V. P. Zolnikov, A.V. Kuznetsov
Features of use of industrial radio Motorola Canopy under low temperatures

The article is devoted to the practical question of exploitation of industrial radio Motorola Canopy under low temperatures. As a result of the preliminary analysis, the authors demonstrate the feasibility and most importantly — the ability to upgrade the heating system of access points and subscriber modules in order to ensure full functionality of the system.

Keywords: industrial radio communication, Motorola Canopy, heating module, sync pulse, cluster management module.

INFORMATION TECHNOLOGIES

A. M. Purtov
Chess as model of information processes

Using chess as an information processes is shown. The information process is considered from the point of view of definition of objective estimations of situations. The concept of an absolute estimation of a situation is entered. The simulation of game in chess is developed. Results of simulations are presented.

Keywords: information processes, simulation, chess.

I. I. Shalmina, V. A. Shevchenko, S. S. Odinets
Dynamic objects interaction problems in three-dimensional space

The article discusses options for presentation of three-dimensional objects in three-dimensional space in order to increase performance of virtual models. «Man-clothing» system has been used as a base model. There is proposed the structure of communication geometric representation and its dependence on physical properties.

Keywords: algorithm, modeling, three-dimensional graphics, «man-clothing» system.

E. B. Yudin, V. N. Zadorozhnyi, M. N. Yudina
Calculation of reliability using the monotonicity property and equivalent structural transformations

The accelerated algorithm to calculate reliability is offered. The method uses equivalent structural transformations and monotonicity property of reliability function.

Keywords: reliability, calculations, random graphs.

V. A. Badryzlov
The principles of generation of random graphs for simulation of the Internet

The possibilities of modeling of the Internet with help of random graphs using various principles of its generation are considered in this article.

Keywords: social network, random graph, preferential attachment

M. A. Ivashchenko, A. B. Korobova
Using skeletal animation for development of virtual dummy and carrying out virtual fitting of zone products in automated mode

In the article the use of skeletal animation for development of a virtual dummy and possibility of its use is considered for design and virtual fitting of zone products in the automated mode.

Keywords: skeletal animation, 3D-the skeleton, the automated design, polygonal model.

V. A. Kulbida
Software package for research of algorithms of correcting properties for error-correcting coding-decoding

The article describes a software package developed by the author, which serves the tool to research the properties of error-correcting codes correction used in the construction of systems of digital data transmission. This software package helps to select the optimal parameters of the encoding-decoding in the design of information transmission. Besides correcting properties studied by the author there is proposed an universal continuous vector code.

Keywords: software package, transmission system, unjammable code, coding, adaptation, universal code.

A. A. Kurchanov, E. B. Yudin
The program for calculation of large networks metrical characteristics

The article solves the problem of calculating metrical characteristics of large networks. The program module implements serial and parallel versions of Dijkstra's algorithm. OmSTU computer cluster is used for testing of the developed program module. Test data include information on real networks.

Keywords: large network, lists of adjacent vertices, shortest path, metrical characteristics of the network, computer cluster, C++ programming language.

RADIO ENGINEERING AND COMMUNICATION

V. Yu. Kobenko
Basic laws of performance of identification operations with distributions

Basic laws of performance of operations with distributions of random signals in the identification numbers field are described.

Keywords: distribution, identification scale, identification operation, form measurement, signal.

Yu. N. Klikushin, V. Yu. Kobenko
Identification method of measurement of signal parameters

The method and device intended for complex measurement of power, time-and-frequency and structural parameters of signals are described.

Keywords: identification scale, measurement of signals parameters, model, periodic and random signals, characteristic frequency.

M. E.Osinkina
SADT-technology application in packaging IS

In the given article the modern approach to a question packaging LSI and SOC is considered. The analysis of packaging IS features taking into account the type of the case and its influence on the technology of solder wire installation is done. The method of packaging LSI and SOC based on SADT-methodology principles is offered.

Keyword: LSI, SOC, packaging, IC, SADT-methodology, the structural analysis, EM fields, thermal modes

CHEMICAL ENGINEERING. CHEMICAL INDUSTRY

S. N. Ryagin, V. A. Ovsyannikova
Analysis of influence of ginger on fermentation process in production of dairy proteinaceous products

During research work the following results are obtained: possibility of use of such spice as ginger in technology of dairy proteinaceous products

for the increase of nutrition value and product ability to storage is theoretically proved and experimentally confirmed; preserving effects of ginger are studied. It is shown that entering into dairy products of ginger puree or ginger powder leads to substantial increase of the content of vitamins (especially A, C and PP), mineral substances (potassium, magnesium, iron) and gives to the final product original specific spicy taste.

Keywords: sour-milk proteinaceous product, ginger, fermentation, periods of storage.

S. O. Podgornyi, O. T. Podgornaya, E. D. Skutin, I. V. Mozgovoi
Acid-base properties of components of the ZnSe-CdTe system

The acid-base properties of ZnSe, CdTe and solid solutions based on them are studied. The subacid surfaces are observed for compounds under study. The possibility of a preliminary estimate of the adsorption sensitivity of components of the ZnSe-CdTe system are shown.

Keywords: semiconductors, solid solution, acid-base properties

PUBLISHING. POLYGRAPH

S. N. Litunov, O. A. Timoshchenko
About influence of tangential stresses on mixing ink

A computational experiment is done for definition of size of quasi-solid body, which is formed in inking unit offset machines due thixotropy of printing ink. Computer simulations obtain the velocity distribution and is designed shear stresses in the zone of flow of the ink. There is built the area of ink rotating as quasi-solid body determined its size.

Keywords: printing ink, inking unit, ink mixing, quasi-solid body.

L. G. Varepo, Kh. A. Babakhanova
The impact of paper composition on its technical properties

The results of studies of various sorts of paper on the performance of its technical properties and quality production print. It shows the impact of cotton and wheat pulp of on absorbency paper.

Keywords: quality of print, paper properties, absorbency.

L. G. Varepo, A. V. Golunov
Practical implementation of the method of selection of the components of the printing system for multi-color printing

The paper presents the results of practical implementation of the «method of selection of the components of the printing system for optimal color reproduction when multi-color printing». The color gamut of the printing system, the main criterion of quality of color reproduction is estimated by analytical integration.

Keywords: print quality, color reproduction, printing system, printing ink.

I. A. Sysuev, A. O. Nikolaenko, D. V. Kashinskiy
Research of cardboard overrun in process of makeready

The article is devoted to the problems of cardboard overrun in the process of offset printing of package. The quantities of setting printing press and cardboard sheets needing for the exit to the run have been installed. The experiments to the control of actual number of sheets spent on makeready are carried out.

Keywords: offset printing, production costs, cardboard, makeready, spent on makeready.

I. A. Sysuev, A. O. Nikolaenko, D. V. Kashinskiy
The analysis of cardboard wastes and downtime of printing equipment in offset blanket washing

The article is devoted to the problems of cardboard overrun and downtime of printing equipment in process of offset printing of package. Program of optimization blanket washing process with a minimum amount of cycles of solution and water has been considered. It is shown that the downtime of printing press is much more expensive than a number of the technological waste cardboard.

Keywords: offset printing, production costs, cardboard, downtime of printing equipment, blanket washing.