Summaries

UDC 519.2

Kitaeva A.V.
LOCAL POLYNOMIAL ESTIMATES OF CONDITIONAL FUNCTIONALS AND THEIR DERIVATIVES BY INDEPENDENT OBSERVATIONS

Estimates of functions substitution of conditional functionals and their derivatives have been proposed. Local linear estimates made by independent observations are taken as substitution elements. Their asymptotic properties are examined; conditional biases and variances are determined. Convergence rate in mean square estimate deviations of the forth conditional moments is also defined.

UDC 62-50:519.2

Demin N.S., Rozhkova O.V.
STUDYING THE EFFICIENCY OF DISCRETE OBSERVATION MEMORY CHANNEL IN EXTRAPOLATION TASK

The problem of studying the efficiency of estimating extrapolation of stationary Gaussian Markovian process of diffusion type (Ornstein-Ulenbek process) for the case of discrete observation fixed memory channel of unit repetition factor relative to discrete memoryless channel has been solved.

UDC 62-50:519.2

Demin N.S., Rozhkova O.V., Rozhkova S.V.
FILTERING IN DYNAMIC SYSTEMS BY MEMORY OBSERVATIONS AT ANOMALOUS DISTURBANCES

The problem of state vector filtration of stochastic dynamic system optimal in root mean square sense has been examined by observations which depend on current and previous state vector values when anomalous disturbances with unknown expectation value work in observation channel beside regular ones.

UDC 519.24

Skripin S.V.
COMPLEX ESTIMATE PROPERTIES IN OBSERVATION CLASSIFICATION TASK

Properties of complex nonparametric estimator of classification using estimates of parametric and nonparametric discrimination models have been given. Complex estimate uses estimates of some density functional in addition. It is shown by statistical simulation where complex estimates for finite samples are preferable than each estimate of classification to designed models.

UDC 517.518.8

Dimaki A.V., Svetlakov A.A.
REGULARIZING IDENTIFICATION PROBLEM SOLUTION USING SENSITIVITY ALGORITHM

The method of regularizing ill-conditioned systems of linear algebraic equations occurring when using sensitivity algorithm has been proposed. The method is based on applying regularization parameter value, changing from iteration to iteration, proportional to an error between known function values and differential equation approximating it. A priori information on known value characteristics is not required for this method implementation. It is shown that the rate and convergence domain of sensitivity algorithm is not worse than A.N. Tikhonov's regularization method.

UDC 681.3

Gubarev V.V., Obeydat A.A.
MUTEX ALGORITHM IN PEER SYSTEMS

Mutex algorithm of simultaneous access of different processes to the same object in dynamic P2P systems aligned to official traffic decrease has been proposed. The main idea is to transfer messages between requesters and a moderator. Information n of object duplicate R_j is propagated in n nodes, (in moderator and its candidates). Nodes send a demand to a moderator of duplicate proprietaries to get the access to an object. Topicality, algorithm concept are described in the work; its scalability and efficiency are experimentally estimated by simulation.

UDC 519.853

Vylegzhanin O.N., Shkatova G.I.
SOLVING THE PROBLEM OF LINEAR PROGRAMMING USING OPERATOR-PROJECTOR

The technique of solving the problem of linear programming based on determination of operator-projector to the space of active constraint vectors has been proposed. Operator-projector is determined by a procedure of recurrent pseudoinversion that supports higher computing stability in comparison with Gauss-Jordan conversion used in a simplex-method. The method allows taking into account presence of constraints-equations, degeneracy of inequality constraint matrices within single procedure.

UDC 681.31:533.95

Grigoriev V.P., Zvigintsev I.L., Kozlovskikh A.V.
METHOD OF SPLINE ABILITY FOR SOLVING VECTOR POTENTIAL EQUATION IN THE TASK OF ELECTRON BEAM TRANSPORT

Method of spline approximation of the second derivative in discrete mesh nodes by spatial value has been proposed for solving vector potential equations in electrodynamic tasks at conversion form equation systems in partial derivatives to the systems of ordinary nonlinear differential equations. It is shown that the developed method of spline approximation for such kind of tasks works faster by a third than standard spline functions built-in Matlab at rather small amount of nodes on a mesh and equal inaccuracy.

UDC 517.977.57

Muromtsev Yu.L., Gribkov A.N., Petrov A.V.
TECHNIQUE FOR ESTIMATING AVAILABILITY OF ALGORITHMIC SUPPORT OF ENERGY SAVING CONTROL SYSTEMS

The technique of using positional relationship of existence domain of solving optimal control and pole set problem in synthesizing variable space for estimating availability of algorithmic support of energy saving control systems has been proposed.

UDC 004.418

Vinogradov A.N., Danielian S.A., Kuznetsov R.S., Chipulis V.P.
THE EXPERIENCE OF DEVELOPMENT AND MAINTENANCE OF INFORMATION-ANALYTICAL SYSTEMS IN HEAT-POWER ENGINEERING

Problems of designing and perspectives of development of information-analytical systems in heat-power engineering have been examined. The examples of implementing and functional abilities of systems currently used are described. Analytical processing of information measurement accumulated at system operation is accented.

UDC 681.51

Nepomnyaschii O.V., Skotnikov G.A., Khabarov V.A.
HARDWARE CHECK OF TEMPERATURE FLOWS IN REAL–TIME MODE

The main problems of obtaining on-line information for designing three-dimensional model of temperature field distribution at a high-temperature manufacturing processes have been examined. Hardware check for constructing high-temperature field model based on recording thermode state in real-time mode has been proposed. Computing equipment and functioning principles of research complex software are described. The results of distribution and appraisal are introduced.

UDC 681.518

Kachkin A.G., Pavlov V.M.
INFORMATION AND ALGORITHMIC SUPPORT OF CONTROL SYSTEM OF DIAGNOSTICS BLOCK BY WINDING POWER SOURCES OF KTM TOKAMAK POLOIDAL FIELD

A list of input/output signals and data of diagnostics block in digital control system of winding power sources of KTM TOKAMAK poloidal field has been compiled. Algorithms of collecting, recording, computing and controlling power source parameters have been developed. Algorithms of power source on-line diagnostics have been proposed. The algorithms were experimentally tested on a power source model.

UDC 681.5

Zamyatin S.V., Plotnikov D.A., Alekseev A.S.
INFLUENCE OF INTERPOLATION NODE LOCATION ON THE RESULT OF ACS IDENTIFICATION AND SYNTHESIS BY REAL INTERPOLATION METHOD

The results of functioning automatic tuning algorithms of ACS regulator coefficients on the basis of real interpolation method have been examined. Node location influence on the principle quality indices of control system obtained as a result of synthesis is shown. Estimates of the obtained solution accuracy are introduced.

UDC 681.518.22

Alekseev A.S., Zamyatin S.V., Plotnikov D.A.
DETERMINING ELECTRIC DRIVE INERTIA MOMENT BY TIME RESPONSES

The technique of determining inertia moment in electric drive has been developed on the basis of the real interpolation method. Calculation is carried out by arbitrary time signals with high accuracy. The efficiency of the technique is confirmed by a number of examples.

UDC 658.512.02

Aleksandrova T.V., Bikineeva Yu.L., Gromakov E.I., Pavlov V.M., Malyshenko A.M.
INTEGRATED SYSTEM OF CABLE MANUFACTURING AUTOMATION

Questions of program-algorithmic constructing the integrated control system of cable production manufacturing have been examined. Functional and program-technical support of workstations and services of their dataware have been proposed for controlling the production process.

UDC 66.012-52

Chursin Yu.A., Goryunov A.G., Liventsov S.N.
DEVELOPING THE MODEL OF MULTICOMPONENT EXTRACTION PROCESS AS A CONTROL OBJECT

Features of processing power reactor spent fuel have been examined. Extraction column is analyzed as a control object; its mathematical description is developed subject to the process features. Multicomponent model of extraction process in a tower is developed on the basis of mathematical description. It may be used for creating automated control system for new-developed devices with similar characteristics.

UDC 66.012-52

Baidali S.A., Dyadik V.F.
CONTROL ALGORITHM OF COMPLEX TYPE DEVICE OF MANUFACTURING URANIUM HEXAFLUORIDE

Control system structure of the device of catching fluorine-containing components of UF_6 manufacturing has been proposed. Control algorithms supporting consistent load of solid raw material have been introduced, software has been described and launched. The possibility of applying algorithms for automated control of complex type device has been shown.

UDC 550.8.02

Istomin A.D., Noskov M.D., Cheglokov A.A.
EXPLORATION WORK DATAWARE AT URANIUM INFILTRATION DEPOSIT

Geological GIS intended for exploration work dataware at uranium infiltration deposit has been given. The system consists of database and several problem-oriented client programs intended for input, storage, processing, interpretation and analysis of geologic, lithologic, mineralogical, technological and other information. Besides, the system allows developing two and three-dimensional digital models of geological environment on the basis of actual data.

UDC 658.512:622.232

Zhiganov A.N., Istomin A.D., Kesler A.G., Noskov M.D., Noskova S.N., Terovskaya T.S.
THE TECHNIQUE OF INCREASING EFFICIENCY OF URANIUM DEPOSIT DEVELOPMENT BY PROGRAM COMPLEX «SEVMUR»

The technique of applying geotechnological information simulating complex «Sevmur» for optimization of uranium deposit block development by the method of sulfuric acid downhole underground leaching has been given.

UDC 624.131:510.6

Strokova L.A.
USE OF FUZZY COGNITIVE MAPS WHEN DEVELOPING BASE RATED MODELS

Cognitive approach to construction of rated model of engineering structure bases has been given. Target factors of cognitive map were determined, cohesiveness and propagation process of graph disturbance were analyzed and studied. It allows determining reserves of increasing efficiency of engineering and surveying departments work in design organizations. Problems occurring when estimating grounds as a base were examined.

UDC 624.131:51-3

Strokova L.A.
USE OF ALGORITHM «DECISION TREE» IN SYSTEMATIZATION OF DETERMINING EQUATIONS FOR GROUNDS

Concept «determining equations» and propositions for systematization of determining equation for grounds have been examined. Ground classification was developed as an instrument of supporting decision making in selecting determining equations for grounds in geotechnical computing by algorithm of decision tree. Significant criteria of determining equations for different ground classes are given. The necessity of preparing database by determining equations for grounds is justified and attributes of such database are indicated.

UDC 681.518:622.276

Zakharova A.A.
METHOD AND ALGORITHM OF ESTIMATING SURFACE AND VOLUMETRIC EFFICIENCY

Method and its algorithm of estimation of the areal sweep and volumetric efficiency for selecting optimal variants of developing oil and gas fields which are developed in the project documentation have

been proposed. Testing has been carried out on the example of a number of deposits within the project for exploration and flowcharts development.

UDC 681.518:622.276

Zakharova A.A., Ivanova M.A.
SOFTWARE «GMUPSCALE» FOR RESCALING GEOLOGICAL MODEL OF OIL AND GAS FIELDS

Software «GMUpscale» and algorithms for automating the process of rescaling digital three-dimensional geological models of oil and gas fields when transferring to hydrodynamic model, realized in it, have been described. The software tool allows reducing time and increasing accuracy of obtaining hydrodynamic models that is confirmed by the results of testing and real data assessment.

UDC 004.942

Gandzha T.V., Zatik O.S.
MODELS OF ECOLOGICAL AND ECONOMICAL SYSTEM COMPONENTS OF OIL AND GAS PRODUCING COMPLEX IN FORMAT OF COMPONENT CIRCUITS

The question of computer simulation of ecological and economics systems of oil and gas producing complex has been considered for detecting the required set of nature-conservative measures for efficient environmental activity at minimal resource consumption. Models of ecological and economics system components are developed in format of component circuits such as models of components of «Region» and «Prirodookhrannye meropriyatiya».

UDC 519.688:53.083.98

Volkov Yu.V., Tartakovskii V.A.
MATHEMATICAL MODEL OF TREE ANNUAL RING MICROSTRUCTURE

Mathematical model of constructing microstructure of tree annual rings applied for recovering bioindicative information been examined. Mathematical model is given in form of wood density oscillations conditioned by change of tracheide parameters in annual rings. Model components such as amplitude and phase, determine tracheide wall thickness and radial size, respectively. The results of model numerical investigation confirming its consistency and applicability for analyzing experimental data are given.

UDC 681.58:004.353.2-022.47

Mezentsev A.A., Pavlov V.M., Sharnin A.V.
TWO-LEVEL COMPUTER VISION SYSTEM WITH LARGE MULTIUSER OR GROUP PANEL

Structure of two-level computer vision system has been described. It allows increasing display space information capacity of multiuser panel of modern nuclear device which is used by operator. It also allows editing efficient display space geometry. Positive effect is achieved by using multiuser and individual video adapters in synthesized system of computer vision system. The structure of the described vision systems is universal and may be implemented at operating experimental facilities.

UDC 004.021

Laevskii V.E.
THE METHOD OF SUBOPTIMAL ESTIMATION OF OPERATING THE ALGORITHMS FOR OBTAINING PATTERN OUTLINE DRAWING

Suboptimal method for estimating quality of image contouring algorithm operation has been examined. The method allows introducing probabilistic factor into testing process of contouring algorithms, coming close to solving the problem from the objective point of view as well as carrying out factor analysis of contouring algorithm operation without using laborious analytical methods.

UDC 004.932; 004.8

Tsoi Yu.R., Spitsyn V.G.
NEUROEVOLUTIONARY METHOD OF IMPROVING VISUAL IMAGE QUALITY

Improving visual image quality using neuroevolutionary approach has been examined. Formulas for estimating image visual quality as well as formulas for fast computing approximate local average and dispersion of image allowing decreasing computational complexity of calculation procedure and keeping acceptable accuracy are given. Three-stage method of improving images is described; the results of its work are compared with the results of known methods; it shows the efficiency of the proposed approach.

UDC 004.5:004.657

Akimov O.M., Shaptsev V.A.
DATABASE INTERFACE INTELLECTUALIZATION

The task of automated transformation of database inquiry, stated in natural language, into standard enquiry in DBMS language has been considered. Algorithm implemented on the basis of conceptual graphs is proposed in the article. Interface interprets natural language enquiry and presents it in the form of conceptual graph. This graph is then modified by knowledge base information on knowledge domains and database structure. Resulting graph becomes a base of forming SQL-enquiry.

UDC 681.3.06

PogrebnoyV.K.
VISUAL PRESENTATION LEVEL OF OPERATION ALGORITHMS OF REAL TIME DISTRIBUTED SYSTEMS IN TERMS OF STRUCTURED MODELING

Development of modular processing concept of designing real time distributed systems in direction of developing automation technology of system model evolution has been proposed. A notion of structured modeling language (SML) and structured modeling technology (SML-technology) is introduced. SML-technology tools are developed according to the rules of semantic medium of system functioning given in knowledge base and determining the area of possible model evolutions. Visual presentation level of system original models in the form of data flow graph in SML language is developed. A set of mechanisms for hipping models of data updating and resource access, which provide insight into the character of operations carried out by SML-technology tools at model evolution, is proposed.

UDC 004.042

Sigov A.S., Dementiev I.O.
MATHEMATICAL SIMULATION AND CONTROL OF INTENSIVE DATA FLOWS IN TUNNELED VIRTUAL MEDIA

The updated approach to the model presentation of virtual media in the area of controlling intensive data flows has been proposed.

UDC 004.056:336.717

Mescheryakov R.V.
INFORMATION HIERARCHICAL SYSTEMS

General approaches to construction of information hierarchical systems have been considered. Systems are classified and hierarchy of information presentation levels in them is proposed to be used. The main problems of information presentation and processing are determined. Basic directions in exploring information interactive systems are stated.

UDC 658.512.011.56:519.87

Silich V.A., Silich M.P.
SYSTEM TECHNOLOGY USING OBJECT-ORIENTED APPROACH

Technology of carrying out system analysis including regulation, object-oriented methodology of simulating complex systems and support tools, has been proposed. Content of technology principle stages

is examined by example of analysis of region power service and development of the program of increasing energy efficiency.

UDC 002.53:004.89

Zagorulko Yu.A.
APPROACH TO SUPPORT MULTI-LINGUAL ACCESS TO INTEGRATED KNOWLEDGE AND INFORMATION RESOURCES OF SPECIFIED KNOWLEDGE DOMAIN

The approach to support of conceptual multi-lingual access in knowledge portal integrating knowledge and information resources referring to the specified knowledge domain has been examined on basis of ontology. Introduction of multi-lingual thesaurus into the system makes it capable of «understanding» multilingual resources and supporting search and visualization of information in various languages. This thesaurus includes knowledge domain terms which allow giving ontology concepts in texts and custom enquiries.

UDC 681.3

Alshaer D.D., Gubarev V.V.
ENQUIRY PROCESSING IN MOBILE OBJECT DATA BASE

A new method of indexing path sections of mobile objects called TR-tree has been proposed. This method allows storing memory and reducing time of enquiring processing due to the use of P^+-tree algorithm that allows storing a section path in data bases once only compare with P-tree algorithm where sections are stored and indexed (each time when a mobile object moves between section). The results of experimental investigations confirming the efficiency of TR-tree algorithm compared to traditional P-tree algorithms are given.

UDC 004.021

Shestakov N.A., Jensen C.S.
BROADENING MOBILE SERVICE CONTEXT BY MEANS OF USER PATH IN STREAMSPIN PLATFORM

Architecture of the StreamSpin mobile services platform using open interfaces for mobile service integration developed by external provider has been given. One of the most important features is introduction of predicted user path into mobile service context. The key features of implementing prediction algorithm of user path are described.

UDC 004.89

Vakhitov A.R.
USING KPI, OLAP AND DATA-MINING TECHNOLOGIES IN DATA PROCESSING

Nonstandard approach to data processing based on joint use of real time analytical processing as well as key indicators of performance and technology of data mining has been examined. The main principles of this approach, application domains, basic terms, as well as main advantages in comparison with classical methods of data processing are discussed. Special attention is given to practical application of this approach in knowledge domain connected with students' scientific research in higher schools.

UDC 681.518:630.431.1(571.62)

Glagolev V.A., Kogan R.M.
INFORMATION SYSTEM OF ESTIMATION AND PREDICTION OF FIRE RISK BY WEATHER CONDITIONS (BY EXAMPLE OF MIDDLE PRIAMURIE TERRITORY)

Information system of estimation and prediction of fire risk increase allowing selecting optimal functions for calculating fire risk indices for the controlled territory as well as carrying out automated short-term predictions estimating their validity has been developed. The developed techniques based on long-term meteorological observations of Middle Preamurie weather stations and weather predictions of general use are intended for prompt fire prevention by forest conservation services and organizations.

UDC 616.441:519.876

Kochegurov V.A., Konstantinova L.I., Marchenko V.V., Abdulkina N.G., Stepanenko N.P.
DEVELOPMENT AND APPLICATION OF INDIVIDUAL INTEGRAL WEALTH INDEX OF PATIENTS WITH THYROID GLAND DISEASE

Nonlinear dynamic body model at normal operation on basis of which a proper integral wealth index is formed using Euclidean distance of the studied object from the model one allowing obtaining ascertained estimates of patient state by observations has been considered. The calculated values of integral wealth index for 3 groups of children with different pathologies of thyroid gland allowed estimating the efficiency of rehabilitation therapy and determined features of children reaction on treatment depending on nosology form.

UDC 004.9:519.252

Ananina O.A., Pisareva L.F., Fokin V.A.
INFORMATION SYSTEM OF ESTIMATING RISK FACTORS OF ONCOLOGICAL DISEASE

Information system for estimating oncological risk factors has been developed on basis of analysis of population questionnaire results. The generalized risk factors were detected by the method of meta-analysis; Prediction model of estimating individual risk of breast cancer was constructed.

UDC 519.256

Dubrovin A.V., Fokin V.A.
OBJECT-ORIENTED APPROACH TO DESCRIPTION OF BIOMEDICAL DATA

The approach to description of medical-biological data on basis of object-oriented technologies has been proposed. Designing information systems for storing and analyzing biomedical data allows keeping conceptual interaction between the results of separate investigations.

UDC 57.087

Pekker Ya.S., Kiseleva E.Yu., Tolmachev I.V.
SOFTWARE FOR ESTIMATING AND MONITORING STATE OF MOTHER AND FETUS

Software for estimating state of the mother-fetus system has been developed, operation of software program applications: data base for storing information on patients; program of registration, accumulation and processing of signals obtained from abdominal electrodes; programs for constructing decision rules has been considered. Investigations allowing determining presence or absence of fetal hypoxia were carried out on the basis of obstetrics, gynecology and perinatology research institute of RAMS SD (Tomsk).

UDC 004.032.6, 004.357

Mordvinov V.A., Shemonchuk D.S.
CONTROLLING FUNCTIONAL CHARACTERISTICS OF MULTIMEDIA IN EDUCATIONAL TECHNOLOGIES

Laws of estimating and controlling content multimedia quality of intensified information educational portals have been studied using semantic measures. Principles and mechanisms of harmonization and normalization of multimedia constituents in content of information educational systems were entered and approved. It was confirmed that content harmonization is the most efficient way of improving multimedia systems functioning in educational technologies.

UDC 004.855

Nemirovskii V.B., Stoyanov A.K.
DEVELOPMENT OF AUTOMATED CONTROL MEANS OF EDUCATIONAL TASK PERFORMANCE IN APPS DESKTOP

Implementation of automated control system of practical knowledge obtained from the course of informatics has been described. Systems include means of task description based on XML langua-

ge and tools of analyzing MS Office documents using mechanisms of COM-technologies created at practical work. The results of using automation controllers for checking tasks performed in MS Word and MS Excel are given.

UDC 004.5

Kadantsev M.V.
EXPERIMENTAL INVESTIGATION OF AUTOFORMALIZATION OF USER ACTIVITY MODEL

The experiment on autoformalization of specialist model of activity performed by a computer has been described. The results of the experiment and their analysis are given. The conclusion on adequacy of the developed algorithm of recognizing activity precedents in OpenOffice medium is drawn. Boundaries of its applicability are determined.

UDC 681

Abunavas Kh.A., Berestneva O.G.
MODELS AND ALGORITHMS OF ADAPTING PROFESSIONAL ACTIVITY SUBJECTS TO WORKING ENVIRONMENT CONDITIONS

Questions of developing models, algorithms and information technology of adapting professional activity subjects to working environment conditions have been considered.

UDC 658.5.012.1

Luneva E.E.
DETECTING PRIORITY BUSINESS-PROCESSES AND THEIR ESTIMATION AT INSTRUMENT MAKING ENTERPRISE

Significance of developing procedure of estimation and selection of actions in development of instrument making enterprises has been disclosed. Typical instrument making enterprise is characterized; problems of its development are described. The method of detecting business-processes which are prior for enterprise and their estimation is proposed.

UDC 618.5:519.68

Zhigulin M.V., Kolomeets A.V.
ESTIMATION OF PASSIVE TEST CONFIDENCE ON BASIS OF AUTOMATON MODEL

Algorithm of calculating system test completeness at passive testing based on cutting all junctions not meeting input-output sequence from mutational automat has been proposed. Estimations of passive test confidence of Simple Connection protocol for different lengths of input sequences are given.

UDC 004.053

Ponomareva O.V., Dubakov A.A.
ANALYTICAL PROCEDURES IN CONTROLLING QUALITY OF SOFTWARE PRODUCT DEVELOPMENT

Methodology of controlling quality of produced software product based on investigation of analytical methodologies has been proposed. The most appropriate positions applicable to activity of IT-company and adapted for functioning Quality Assurance (QA) department are analyzed. The main idea of the proposed procedure is a team work of an analyst and an QA engineer, use of analytical methods in respect to Quality Assurance field, involvement of analysts into testing and QA engineers – into system analysis and decision-making procedures. Proper method assisting in making decision on company involvement into the project was developed on basis of analytical procedure Quality Function Deployment. The conclusion on efficiency of the proposed methodology was drawn.

UDC 004

Alubin A.V., Grachev V.V., Matveev S.A., Sonkin M.A.
ENGINEERING ASPECTS OF ESTIMATING EFFICIENCY OF BULK DATA STORAGE AND PROCESSING SYSTEMS

The main approaches to efficiency estimation have been determined, comparative analysis has been carried out and systems of storing data of software key manufacturers have been tested.

UDC 369:519.2

Koshkin G.M., Lankina N.V.
NONPARAMETRIC ESTIMATION OF NET-BONUSES FOR ENDOWMENT LIFE INSURANCE

The task of estimating net-bonus at endowment life insurance has been considered. Nonparametric estimation of net-bonus is synthesized; the main part of asymptotic mean-square error of estimation and its marginal distribution are determined. The results of statistic simulation are given.

UDC 514.85

Bubenchikov A.M., Scherbakov N.R.
MATHEMATICAL SIMULATION OF A NEW KIND OF LINKING DYNAMICS IN TRANSMISSION MECHANISMS

Mathematical model of reducer operation has been constructed. It uses a new kind of linking of rotor wheels, one of which represents screw eccentric and a profile of another one is constructed on basis of cycloidal curve. Such linking possesses high power characteristics and allows obtaining high reduction ratios in one stage. The computer program that illustrates kinematic cooperative motion of ideal geometric figures – face sections of functioning mechanism and allows determining numerical characteristics required for construction was developed.

UDC 514.85

Scherbakov N.R.
OPTIMIZING PARAMETERS OF A NEW KIND OF WHEEL LINKING WITH SPIRAL TEETH

Optimizing geometry parameters of a new kind of wheel linking with spiral teeth and namely, eccentric-cycloidal one has been considered. The linking is formed by spiral teeth and a smaller wheel has one tooth, profile of which in face section represents an eccentric shifted circle. Tooth profile of a larger wheel in face section represents a cycloidal curve. Contact stresses and efficiency depend on eccentricity and diameter of profile circle of the smaller wheel. Algorithm of calculating optimal values of these parameters for achieving the highest efficiency at maximum contact stresses is given.

UDC 514.85

Scherbakov N.R.
COMPUTER MODEL OF DYNAMIC STATE OF RACK-AND-GEAR DRIVE WITH LINKING OF NEW KIND

Mathematical model of rack gear operation has been constructed. It transforms rotary motion into translation one and uses eccentric-cycloidal linking. The mechanism consists of a worm element, acting as a generator and an output part (rod) constructed on basis of cycloid. The proposed new kind of linking possesses high power characteristics and allows obtaining low rates of rod travel. The computer program illustrates kinematically cooperative motion of ideal geometry figures – face sections of operating mechanism and allows determining numerical characteristics required for construction as well as optimal modes of operation of the examined systems was developed.