

ABSTRACTS
Radioelektronika i informatika. 2005. № 2

UDC 621.317.444+332.6

Module system of measurement of axial dipole momentum of magnetic field – sources / A.V. Degtyariov // Radioelektronika i informatika. 2005. № 2. P. 4-6.

A four-point magneto-metrical method for measurement of axial dipole momentum of exterior magnetic field-sources and measurement module system realized this one, have been considered in this paper. A mathematical model of electrical signal being measured, as well as multiple error of the measurement-method, has been represented here.

Ref.: 5 items.

UDC 621.385.6

On Oscillations of a Re-Entrant Electron Beam in Crossed Fields / A.V. Gritsunov // Radioelektronika i informatika. 2005. № 2. P. 7-15.

The oscillations of an azimuthally re-entrant electron beam nearby the distributed emitting surface in crossed fields are studied using the numerical experiments. They are the main causes of noises in both the static and the dynamic states of the crossed-field devices (CFDs). In the static state those are: the tangential eigenmodes of the electron cloud; the secondary-emission bunching of the hub; the solitons in the electron beam. In the dynamic state those are the transient and the stable convective clouds in the electron spokes. An influence of the abovementioned instabilities on the electron beam oscillation spectra in the CFDs is investigated.

Fig. 5. Ref.: 23 items.

UDC 621.317.08

Using the Monte Carlo method for uncertainty analysis of a voltage nonsinusoidality coefficient / I.P. Zakharov, G.G. Safaryan, M.P.Srrgienko // Radioelektronika i informatika. 2005. № 2. P. 15-18.

The possibilities of using the estimations of an average of distribution and a mean square deviation of a voltage nonsinusoidality coefficient measuring uncertainty are researched. The researches are made in assumption that the noise has a normal distribution. The frequency deviation influence is also considered.

Fig. 2. Ref.: 7 items.

UDC 621.396.2: 621.316.2

Generalized lattice filter / V.A. Tihonov // Radioelektronika i informatika. 2005. № 2. P. 19-23.

Application of third order statistics of non-Gaussian processes for lattice filter synthesis is considered. Equations for the filter's coefficients calculation and the filter structure were found. Formula's for evaluation by direct and inverse predictive errors of generalized filter coefficients were obtained.

Fig. 1. Ref.: 14 items.

UDC 621.317.7

Nonlinear Dynamics of the Semiquantal Ballistic Electrons in Superlattices under the Strong Microwave Excitation // L.V. Yurchenko and V.B. Yurchenko // Radioelektronika i informatika. 2005. № 2. P. 23-28.

Semiquantal dynamics is an advanced approximation proposed for the analysis of the quasi-classical motion of a quantum particle in the potential profile. The approximation provides a finite dimensional formulation of the problem by restricting the full Hilbert space of the quantum system.

Fig. 4. Ref.: 12 items.

UDC 621.396.6.004 : 004.942

Tolerance analysis for nonmonotous output functions /M.P. Gaponenko, O.Y. Voropay // Radioelektronika i informatika. 2005. № 2. P. 29-32.

The tolerance analysis method for output functions, which have extreme point in input parameters tolerance interval, is proposed. The method of optimization on the base of Broyden–Fletcher–Goldfarb–Shenno method with simple restrictions is elaborated for finding minimal and maximal output function values. The optimal selection of search initial point with the use of linear interval model is proved.

Tab. 3. Fig. 2. Ref.: 7 items.

UDC 618.514.01:517.977.5

Quasilinear task of analytical construction of optimal regulators / A.E. Radievski // Radioelektronika i informatika. 2005. № 2. P. 33-36.

Within the procedure of analytical construction of optimal regulators we consider the problem of dynamic synthesis for quasilinear object.

Ref.: 14 items.

UDC 519.6:514.1

Extreme properties of functions on composition images of combinatorial sets / I. Grebennik // Radioelektronika i informatika. 2005. № 2. P. 36-44.

Extreme properties of convex functions on the composition images classes of combinatorial sets are investigated. Estimations and sufficient conditions of minimum of functions defined on the sets of pair permutations, pair arrangements and pair combinations are built. The way of optimization of proposed estimations is given.

Ref.: 19 items.

UDC 681.51-192(075.8)

Fault detecting in ASC (automatic control system) for distributing stations by using mathematical model / K.E. Gerasimenko // Radioelektronika i informatika. 2005. №2. P. 45-48.

Distributing station's mathematical model application for solving the fault detection task in ASC(automatic control system).

Tab. 2. Fig. 3. Ref.: 7 items.

UDC 681.324

Synthesis of mealy FSM on verticalized flow-chart // A. Barkalov, A. Bukowiec // Radioelektronika i informatika. 2005. № 2. P. 49-52.

A method of improving of characteristics of Mealy FSM with encoding of the fields of compatible microoperations is proposed. Method is based on verticalization of initial flow-chart that permits to reach the full compatibility of all microoperations. In this case only one decoder is needed to implement the system of FSM microoperations. An example of proposed method application is given.

Tab. 3. Fig. 7. Ref.: 8 items.

UDC 519.713.1

Developing internal state of the discreet automatic manipulator operating device by sensors data / I.A. Orlovskiy, S.V. Steklenyov // Radioelektronika i informatika. 2005. № 2. P. 53-56.

The technique of simplifying circuit synthesis for the problems having plenty of sensors which signal about various value of one coordinate for the mechanism is offered. Simplification is based on carrying out preliminary data processing from sensors for developing internal state of the automatic device. The estimate of reducing dimension of the automatic device tables is given. Synthesis and modeling of a specific pattern according to the above technique are done.

Tab. 4. Fig. 3. Ref.: 3 items.

UDC 621.391

Binary polyadical encoding on the quantity of series of units / V.V. Barannik, A.K. Yudin // Radioelektronika i informatika. 2005. № 2. P. 56-63.

The binary data encoding on the basis of the limited quantity of positions with the settled appearance of units and set quantity of series of units is examined in the article. The developed encoding provides the additional removal of structural surplus without bringing of error.

Tab. 2. Fig. 2. Ref.: 5 items.

UDC 519.713

The models of data representation in World Wide Web / M.F. Bondarenko, A.S. Koryak, S.A. Roshka, I.V. Tomich // Radioelektronika i informatika. 2005. № 2. P. 64-68.

In article the new information model of data is offered, allowing concluding indistinctly structured text data from a collection of documents HTML formatted, taken from network WWW. The organization of text within the framework in offered model of data allows investigating a relative positioning of significant elements (words, phrases, terms) in collection depending on context of their use. The new approach to predesign stage in collection of indistinctly structured text data enables to apply new statistical methods on research of laws, the technologies based on conceptually - guided methods text mining.

Tab. 1. Ref.: 17 items.

UDC 519.67

The convergence of a G-projection method // S.I. Yaremchuk, L.V. Rudyuk // Radioelektronika i informatika. 2005. № 2. P. 69-73.

The problem of optimal rectangles placement in rectangular area is given. The possibility of given problem replacement by series of subproblems is proved. The Rozen method for chosen subproblem solution is given, the theorem about method time complexity is given and proved. The main idea and algorithm of developed G-projection method for chosen subproblem solution is given, the theorem about method convergence is given and proved.

Fig. 2. Ref.: 6 items.

UDC 683.1

Web site topics determination and optimization based on search queries / R.O. Holoshchuk, A.M. Peleschyshyn // Radioelektronika i informatika. 2005. № 2. P. 73-78.

The problem of a Web-site design with strictly and efficiently determined topics is researched in the paper. Users' queries to search engines are chosen as the site topics carrier. Based on this research authors propose the formal approaches to optimal site topics determination. The example illustrate the efficiency of proposed approaches.

Fig. 2. Ref.: 10 items.

UDC 519.7

About a logical nets formal structure / O.V. Kalinichenko, L.L. Kozyaev, R.V. Melnikova // Radioelektronika i informatika. 2005. № 2. P. 79-83.

The construction of algebrological structures is considered. Its using outcomes to engineering networks named logical. In comparison of logical networks with the basic types of neuro-structures close similarity of technical and biological constructions structure is revealed. It allows to describe in exact technical and mathematical terms principles of brain functioning.

Tab. 3. Fig. 6. Ref.: 2 items.

UDC 621.391:51.142

Verification of multiple series summation method in RKHS / S.V. Chumachenko // Radioelektronika i informatika. 2005. N 2. P. 83-85.

Numerical results which show validity of some multiple series which are received by a Series Summation Method in RKHS are resulted.

Fig. 2. Ref.: 9 items.

UDC 519.852.67+557.4

Models identification of the critical power of the environmental pollution source / A.Y. Gaidus, V.P. Putyatin // Radioelektronika i informatika. 2005. № 2. P. 86-88.

The problems of the characteristics identification of the emission source of the industrial enterprise as to the limitation of the field pollution value in the ecologically important region are considered. The solution of the corresponding regional problems, describing the pollution field, is used as the basis for the construction of the models of the source characteristics restoration. One-, two- and three-dimensional non-stationary cases of the field pollution description are considered.

Fig. 1. Ref.: 4 items.

UDC 621.03

Modeling and survivability analysis of onboard informational and control systems with unredundant functional structure using / N.P. Borodavka, V.S. Kharchenko // Radioelektronika i informatika. 2005. № 2. P. 89-95.

An approach is proposed to model of onboard informational and control systems (OICS) functioning for analysis of OICS survivability. A method is described for OICS survivability. It based on task data receiving as model results. A method is proposed to form determinate quantitative estimations of OICS survivability.

Tab. 7. Ref.: 14 items.

UDC 519.81

Mathematical model of the educational literature distribution / B. P. Bocharov // Radioelektronika i informatika. 2005. № 2. P. 96-100.

The mathematical model of the educational literature distribution has been designed. The region of acceptability and the set which contains the optimal decision have been found. The literature provision coefficient has been formally defined. This indicator might be used to compare different distribution alternatives. The dimension of matrix which determines the educational literature different distributions is shown to be very large and the comparison result – to be a hardly formalized procedure. That's why the rational decision-making procedure is effectively described with the generalized mathematical programming task (the vector criteria are compared).

Ref.: 5 items.

UDC 621.383.8:621.396.96:621.396.6

Noise-immune algorithm with sphere-oriented selection of components of color images / B.P. Rusyn, V.G. Ivanyuk, D.V. Ivanyuk // Radioelektronika i informatika. 2005. № 2. P.101-106.

Expressions of selection's quadratic's form are derived using transform of the spheres coordinates in color space that is oriented on color image segments description. These expressions allow analyzing and segmentation with contours definition of images to be carried out. A color images processing algorithm based on using of these expressions is proposed.

Fig. 4. Ref.: 10 items.

UCD 519.71

Analysis of fractal quasitrees / L.N. Sergeeva, Y.S. Zadorozhkina // Radioelektronika i informatika. 2005. № 2. P. 107-110.

The fractal quasitrees properties were studied. Fractal quasitrees are used for modeling of complicated system structure. Comparative analysis of the p-adical fractal tree numerical characteristics and the fractal quasitrees numerical characteristics carries inference that these graph classes are similar in structure and justifies the name «quasitrees» assigned to the singled-out class of fractal graphs.

Tab. 1. Fig.1. Ref.:6 items.

UDC 621.3

Rating of a fire hazard of the tank with petroleum under a flame of the shining tank / Yu.A. Abramov, A.E. Basmanov // Radioelektronika i informatika. 2005. № 2. P. 110-112.

The problem of heat of the tank with petroleum is studied. The system of the differential equations that describe the distribution of temperature in an arbitrary instant is solved by the numerical method.

Fig. 4. Ref.: 3 items.

UDC 004.93

Realization of reconstruction method of a surface microstructure from its pair of optical stereo images / A.T. Snyavskyy, B.P. Rusyn // Radioelektronika i informatika. 2005. № 2. P. 112-118.

Investigation results of the approaches to solving of three-dimensional surface reconstruction problem from a pair of stereo images are presented in the paper. Realization of the algorithm includes solving of several problems, such as: determination of epipolar geometry of the stereo system, image matching and recalculation of three-dimensional coordinates of points from their projections. A reconstruction algorithm has been elaborated taking into account peculiarities of the surface microstructure reconstruction in fractography and metallography.

Fig. 4. Ref.: 5 items.

UDC 681.3:51

Technique of adaptive extraction and analysis of knowledge for construction of base of knowledge and fast acceptance of the decisions in systems of designing of design works of the situation centres / Fastova D.V., Kuzemin A.Y., Yanchevskiy I.V. // Radioelektronika i informatika. 2005. № 2. P. 118-120.

One of the basic questions from the point of view of mathematical modeling during construction of information systems for situation management is the way of representation of knowledge with which help system should accept the decisions in a concrete situation. The representation of knowledge can be given by a way, which the transition of the submitted fragments of the information in the terms of structure of bases of knowledge and databases would allow. The acceptance of the decisions can be carried out with the help of the device of indistinct sets.

Ref.: 4 items.