

ABSTRACTS

Radioelektronika i informatika. 2006. № 1.

UDC 621.391:621.396

Usage of higher order statistics in a recognition problem of non-Gaussian processes / V.A. Tykhonov, K.V. Netrobenko. // Radioelektronika i informatika. 2006. № 1. P.4-8.

A possibility of higher order statistics usage in a recognition problem of non-Gaussian processes unrecognizable by the second order statistics is shown. Recognition methods using the third order statistics are proposed. The parameters of a generalized autoregressive model as well as the third order moment functions are applied as features.

Tab. 1. Fig. 5. Ref.: 10 items.

UDC 621.372.852

Scattering of the wave H_{10} of the thin vibrator with the variable impedance in the rectangular waveguide / M.V. Nesterenko, E.Y. Belogurov // Radioelektronika i informatika. 2006. № 1. P. 8-12.

The problem of scattering a wave of the basic type by the thin vibrator with the variable surface impedance located in a rectangular waveguide is solved. Calculations are carried out and graphs of the module and a phase of a reflectivity for various functional dependencies of an impedance on length of the vibrator represented.

Fig. 5. Ref.: 10 items.

UDC 621.396.96.001.2

Use of geometrical representations at synthesis and analysis of signals of radioacoustic systems / V.M. Kartashov, A.V. Voloh // Radioelektronika i informatika. 2006. № 1. P. 12-16.

It is shown, that bidimensional mutual correlation functions of probing acoustic and electromagnetic fluctuations are defined with distance of signals in functional space at their mismatch on range and in the field of wave frequencies. Use of the entered geometrical images essentially simplifies understanding and facilitates the decision of problems of the analysis and synthesis of probing fluctuations. With use of the developed methods the signals forming plateausimilar a body of dispersion are received.

Fig. 2. Ref.: 6 items.

UDC 621.396.96

Signal spatial filtering method in the case of low-altitude source location above scattering surface / A.T. Synyavskyy, V.P. Antonyuk, V.G. Grek, M.V. Lobur, Ye.I. Klepfer // Radioelektronika i informatika. 2006. № 1. P. 16-20.

The problem of unknown signal detection and direction determination of its arrival is analyzed in the case of presence of a coherent interference. A low grazing angle and two-way propagation condition is a main cause of this interference. The proposed method of spatial filtering consists in signals processing for four-element linear antenna array. Analytical solution of the stated problem gives possibility to create a simple scheme of the method implementation.

Fig. 5. Ref.: 4 items.

UDC 517.958:536.71

Construction of the optimal quasi-conformal mapping for the numerical simulation of diffusion at a microdisk electrode / A.I. Oleinick // Radioelektronika i informatika. 2006. № 1. P.21-26.

A new method for the construction of the optimal quasi-conformal mappings is presented in the paper for a particular case of the microdisk electrode system. The method is further generalised by utilising spline functions for the case when the optimal coordinate compression function cannot be obtained in the form of a closed analytical expression. The generalized approach has been applied to the microdisk electrode and the resulting spline-function and the analytical compression function have been compared.

Fig. 3. Ref.: 9 items.

UDC 621.372

Nonlinear parametric synthesis of follow-up phase detector / A.P. Bondarev // Radioelektronika i informatika. 2006. №1. P. 27-30.

The nonlinear mathematical model of a follow-up phase detector is showed, which one allows for influence of noises. The optimization by criteria of a minimum phase error, maximum noise stability and maximum frequency detuning is conducted. Is showed, that the profit of nonlinear synthesis makes from several percents up to several times.

Tab. 3. Fig. 6. Ref.: 7 items.

UDC 519.859

Mathematical modelling of interactions of interval cylindrical objects / Evseeva L, Romanova T., Shekhovtsov S.B. // Radioelektronika i informatika. 2006. № 1. P. 31-35.

A concept of interval cylinder as a point set of three-dimensional interval space with Euclidian metric is introduced. Interval -mapping is constructed as a tool of mathematical modelling of relations (touching, intersecting, nonintersecting and inclusion) for a pair of interval cylindrical objects.

Ref.: 7 items.

UDC 519.859

Complete class of Φ -functions for circles and rectangulars with rotations / M.V. Zlotnik // Radioelektronika i informatika. 2006. № 1. P. 36-40.

Recently the problems of optimum cutting, packing and placement of objects with rotations are of interest. For the solution of these problems it is necessary to have analytic description of interaction of two objects, which have ability to rotate. The Φ -function gives such possibility. Therefore in the paper the full class of Φ -functions for objects with rotations having the frontier circle or rectangle is constructed.

Fig. 15. Ref.: 9 items.

UDC 621.3

Rating of a flame pulsing at combustion of petroleum / Yu.A. Abramov, A.E. Basmanov // Radioelektronika i informatika. 2006. № 1. P. 40-42.

The problem of definition of main distribution parameters of the flame pulsing is described. The constructed procedure allows find these parameters by analyzing a image of the flame.

Fig. 2. Ref.: 3 items.

UDC 615.89:621.372

Forming impulses for multicomponent mixtures fractions crushing / S.N. Vasiljev, N.N. Gora // Radioelektronika i informatika. 2006. № 1. P. 42-45.

The optimum process of generation and transmission impulses which affect a multicomponent mixture with the purpose of changing its properties is explored. The multi-mode channel of transmitting impulses is considered as a control system. The general criteria of spectability and dirigibility of the impulse forming process are found. The conclusions are illustrated by the results of numerical experiments.

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

UDC 681.324

Optimization of the compositional microprogram control unit's circuit with codes sharing / A.A. Barkalov, R.V.Malcheva, A.A.Krasichkov, Khaled Barakat // Radioelektronika i informatika. 2006. № 1. P. 46-50.

The sharing of the FSM state's codes in the CMCU circuit is offered in the article. The conditions of address transformer usage for addressing of microinstructions are considered. The example of the CMCU circuit synthesis with address transformer is given. The carried out researches have shown that the method reduces hardware expenses on 12-16%.

Tab. 2. Fig. 4. Ref.: 8 items.

UDC 519.714.5

On decomposition of Petri net by means of coloring /Wegrzyn Agnieszka // Radioelektronika i informatika. 2006. № 1. P. 50-56.

In the paper a method of decomposition of hierarchical Petri nets is presented. Such approach is based on P-invariants and testing of dependence between deadlocks and traps. The presented decomposition method can be used for e.g. generation of Finite State Machine (FSM).

Fig. 9. Ref.: 16 items.

UDC 681.3.06

Simple programming language translator development / Tsimbal O., Tsekhmistro R. // Radioelektronika i informatika. 2006. № 1. P. 57-65.

The simple programming language interpreter development, that consists of lexical and syntax analyzers, table control and interpreting units is described. The translator is implemented in Visual C++ environment.

Fig. 1. Ref.: 4 items.

UDC 519.6:004.93

The feature selection method based on the modified ant colony optimization method / S. Subbotin, A. Oleynik, V. Yacenko // Radioelektronika i informatika. 2006. № 1. P. 65-68.

Work is devoted to the solution of a feature selection problem for building of diagnostic and predicting models. The new method of search of an optimum feature set based on multiagent search is offered. The software that realizes the created method is developed. On the basis of the developed method and the software the feature selection problem for forecasting hardening coefficient of airengine detail is solved.

Tab. 1. Fig. 1. Ref.: 7 items.

UDC 681.3.07

Image recognition in space of local invariant features / E.P. Putjatin V.A.Gorohovatsky // Radioelektronika i informatika. 2006. № 1. P. 69-72.

Researched the problem of the image recognition in space of local invariant features. Offered structured methods possess the resistance to action of the background and local distortion. Present the results of the research to noiseproof factor and speed of algorithms, realizing described methods.

Tab. 3. Fig. 4. Ref.: 8 items.

UDC 330.45:330.47

About state and concepts of evolution networks management and telecommunications systems in Ukraine / K.Y Klymova, S. V. Shevchenko // Radioelektronika i informatika. 2006. № 1. P. 73-78.

The globalization tendencies of the national communication services markets in a context of world telecommunications development features are considered. The basic tactical and theoretical tasks for achievement by Ukraine of a world level informational telecommunication infrastructures are allocated. The approach to designing forecasting system and evolution estimation of the networks is offered.

Ref.: 8 items.

UDK 004.738.52:004.031

Classification method for information web systems / V.Sayenko, V. Bikanov, I. Sayenko // Radioelektronika i informatika. 2006. № 1. P. 78-86.

The classification method and classification characteristics for information web systems are proposed. The classification characteristics are based on types, kinds, system's goals, user's goals, functions and methods. Several examples were considered.

Tab. 10. Fig.3. Ref.: 8 items.

UDC 519.67

Placement optimization of objects that can be decomposed on rectangles / S.I. Yaremchuk, Yu.A. Shapovalov // Radioelektronika i informatika. 2006. № 1. P. 87-90.

The problem of optimal placing of special-shaped objects was considered. The mathematical model was built. The modified method of feasible directions was developed for considered problem.

Fig. 2. Ref.: 7 items.

UDC 004.93+519.2

Statistical detection criteria realization for problems of pattern recognition/ B.O. Kapustiy, B.P. Rusyn, V.A. Tayanov // Radioelektronika i informatika. 2006. № 1. P. 91-96.

In this paper the three models of likelihood ratio functions for object clustering have been built and investigated. It have been marked the limitations of the second model usage of the likelihood ratio functions and the difficulties with the mean and variance calculation for such a distribution and the third model. The first and the third model of the likelihood ratio functions have been investigated experimentally. These models have been used for the Neyman-Pearson, Siegert and Wald tests. The peculiarity of every criteria application has been described. The limit threshold value of the likelihood ratio function has been determined.

Fig. 8. Ref.: 4 items.

UDC 621.383.8:621.396.96:621.396.6

Frequency-colored selection of crack of the metallography image / Rusyn B.P., Ivanyuk V.G., Korniy V.V. // Radioelektronika i informatika. 2006. № 1. P. 96-101.

Another approach is based on the new fact that a cracks description in the plane, under amplitude and frequency, may determine the increment of information quantity. Expressions of the quadratic form selection are derived using the construction's increment of information quantity. Algorithm for image processing is proposed basing on these expressions. This algorithm is used in developed software that carried out analysis of images of materials microstructure.

Fig.: 5. Ref.: 10 items.

UDC 519.859

Constructing Φ -function of convex n-dimensional polytopes /N. I. Gil, M.S. Sofronova // Radioelektronika i informatika. 2006. № 1. P. 101-105.

In article the approaches for constructing special functions for a class of convex n-dimensional polyhedral objects (of n-polytopes), and also for n-polytope and point set being closure of addition of some polyhedral domain up to are offered. The theorems that the constructed functions are Φ -functions are proved. Based on the Φ -functions the conditions of non-intersection of n-polytopes, and also conditions of placement of n-polytopes in the given domain (n-polytope) are described. The special case when domain of placement is n-dimensional parallelepiped is considered and the appropriate Φ -function is constructed.

Ref.: 10 items.

UDC 622.691.4.052

Vehicle facilities for vybrodyagnostyrovanyya gazomotornykh compressors / S. Saprykin // Radioelektronika i informatika. 2006. № 1. P. 105-110.

Conducted theoretical and experimental researches on the single-cylinder compartment GMK and in the operating terms KS, collected dependences of levels of vibration from work, powers, technical state, are set possible levels of vibration on frequency bars for forming of diagnostic signs, which are applied at development of vehicle and programmatic facilities, technologies for vybrodyagnostyrovanyya GMK 10ГKH, МК8, ДР12, Z-330. To advantages of vehicle facilities of vibration diagnostics behave simplicity in exploitation and practically complete state information tsylyndroporshnevoy group of bearing knots, turbokompressora. Job performances are inculcated on enterprises NAK «Neftegaz of Ukraine» and in the countries of near foreign.

Fig. 8. Refs.: 15 items.

UDC 355.586: 65.012.122

The model of Hammerstain type for the description of non-linear multi-factors effect on human being / N. N. Serdjuk // Radioelektronika i informatika. 2006. № 1. P. 111-113.

The non-linear functional based on Hammerstain model of bio-effect in n-space of factors is considered. It is shown that the principal term of such a model forms a doze functional, but it may not appear to be positive. The estimate of tolerance is carried out.

Refs: 2 item.

UDC 389+517.958:532.5

The estimation of parameters and metrological qualification of mathematical model of gas-compressor unit / O.A. Senderov // Radioelektronika i informatika. 2006. № 1. P. 113-121.

In given article is conducted analysis of proposed mathematical model of gas-compressor unit for subject of the possibility of the conducting to greatly exact parametric identification, is motivated choice of parameters of mathematical model of gas-compressor unit and way to identifications, and is estimated accuracy of identification. The Developed way to metrological qualification of mathematical model of gas-compressor unit for using them in task of the finding estimation degree of the compression, volumetric productivity and input power of a centrifugal supercharger and is approved offered way on real data.

Tab. 2. Fig. 6. Ref.: 15 items.

UDC 621.396: 510.62

Recognition of radar spectrum image with adaptive weight ratios / V.V. Zhirnov, S.V. Solonskaya // Radioelektronika i informatika. 2006. № 1. P. 121-123.

The system of radar spectral image recognition with adaptive weight ratios to takeoff mobile objects marks against a background of the discrete clutters of “angel - echo” type is resulted. Algorithm of spectral images recognition based on predicate equations decision of spectral analysis is offered.

Fig. 4. Ref.: 3 items.