THE APPLICATION OF KARNAUGH MAPS FOR THE POLINOMIAL TRANSFORMATION OF BOOLEAN FUNCTIONS

Ju.S. Akinina, S.L. Podvalniy, S.V. Tyurin

This article offers a new way of polinomial transformation of boolean functions based on the method of minimization of boolean functions by means of Karnaugh map

Key words: Zhegalkin's polynomial, boolean function, Karnaugh map

MULTIALTERNATIVE SYSTEM OF DECISION MARKING FOR SOCIOTECHNICAL OBJECTS ON BASIS OF THE GAME THEORY AND MULTIAGENTS THECHNOLOGIES IN THE RISK

D.V. Ivanov

The article deals with multi-alternative decision support system based on game-theoretic and multi-agent approaches. In particular, we consider the principles, methods, and conditions are different approaches formalization of the decision, proposed by game-theoretic model based on the scenario approach based on the cognitive data, as well as the proposed event driven simulation agent model in the framework of multi-agent approach

Key words: decision making, socio-technical objects, game theory, knowledge base, multi-agent technology

MATHEMATICAL RESEARCH OF FLOW AROUND AN AIRCRAFT

T.B. Burenko, V.A. Nesterov, A.P. Budnik

The article comments on the technique of obtaining the aerodynamic characteristics of the mathematical model of the aircraft. The task is performed by means of computer engineering with the help of a gas-dynamic analysis software package, and solid modeling. It describes the main features of this method comparing to traditional full-scale wind tunnel tests. Method of using the data of computational experiment is shown to test the convergence of the results obtained by calculating with the available experimental data. The obtained characteristics are required for required for the modeling of trajectories of droppable objects in the vicinity of the carrier aircraft

Key words: downwash, solid modeling, gas-dynamic analysis, finite volume method, KEAKN

MODEL OF THE OPTIMAL DEVELOPMENT STRUCTURE FOR MULTISERVICE NETWORKS

D.E. Elizarov, V.L. Burkovsky

The article describes the model of the selection of the optimal development structure for multi-service networks. Offers its practical implementation in the form of the program, describes the basic modules required for the program

Key words: dynamic programming, discrete programming, multiservice networks

DECISION SUPPORT SYSTEM BY THE EXAMPLE OF THE OFF-LINE HANDWRITTEN TEXT RECOGNITION

A.A. Mozgovoy

The paper reviews results of the implementation of elements of a decision support system in the graphical user interface of the off-line handwriting text recognition system. The elements of decision support in the form of expert assessments can significantly enhance the quality of handwriting text recognition

Key words: optical recognition, handwriting, HMM, DSS

STRUCTURE OF EXPERT SYSTEM OPERATIVE DIAGNOSIS AND TREATMENT OF LUNG DISEASES

V.A. Vasilchenko, V.L. Burkovsky

The article proposes an integrated structure of the knowledge base is the basis for building a distributed medical information system operational diagnosis and treatment of lung diseases

Key words: expert, diagnostics, coefficient of confidence

A MODIFICATION OF THE SIMPLER ALGORITHM FOR SOLVING THE PROBLEM OF MODELING THE PROCESS OF CONTINUOUS CASTING OF NON-FERROUS METALS

E.E. Fomina, N.K. Zhiganov

The article describes a mathematical model of the process of continuous vertical casting of cylindrical billets of non-ferrous metals. To solve the system of governing equations of casting was suggested the modification of the SIMPLER algorithm, which allows to increase the convergence rate of the method

Key words: mathematical modeling, metal casting

ALGORITHMIZATION OF DECISION-MAKING DURING TREATMENT OF ACUTE PYELONEPHRITIS BASED ON ANALYTIC HIERARCHY PROCESS

A.A. Spiryachin, D.E. Stroeva, A.V. Burkovsky, A.V. Kuzmenko

The article describes algorithmization of decision-making during treatment of acute pyelonephritis based on analytic hierarchy process

Key words: algorithmization, analytic hierarchy process, decision-making, pyelonephritis

MODELLING OF THE DISTRIBUTED INFORMATION SYSTEM ON THE BASIS OF QUEUEING NETWORK

D.V. Makarov, V.L. Burkovsky

The article deals with the analysis of the characteristics of inhomogeneous closed queuing network with the transition probabilities, depending on network conditions. The algorithm allowing to form queuing network of the distributed information system with use of models of its elements is offered

Key words: structural model, a mathematical model, queuing network, transaction processing unit

FUNCTIONAL AND ALGORITHMIC ORGANIZATION SYSTEMS OF REGIONAL ENERGY CONSUMPTION

V.N. Krysanov, A.L. Rutskov, Shukur Omar Shucur Mahmoud

In article the functional and algorithmic organization of modern systems of regional energy consumption and optimization of their parameters is considered

Key words: electrical power system, wholesale market of the electric power and power, algorithms of optimization

ANALYSIS OF RECOVERY SYSTEMS VAPORIZERS OF FREEZING PLANTS

V.Yu. Ovsyannikov, S.M. Yaschenko, O.A. Semenikhin, A.N. Denezhnaja

The article analyzes the cycles of evaporators cryoconcentrations during regeneration by thawing frozen ice. Noted that the energy efficiency of refrigeration equipment can be increased by using a heat capacity of the frozen ice of the

concentrated product and melt water. Analyzed different types of defrost systems the chiller position with energy and technical- economic efficiency. Noted that the energy efficiency of refrigeration equipment can be improved by using the thermal efficiency, the resulting ice from the concentrated product and melt water. Noted that energy efficiency is reduced defrost with increase structural mass chiller plant

Key words: techno - economic analysis, the chiller, plant regeneration, evaporator defrost

DEVELOPMENT OF A UNIVERSAL PUNCH

M.V. Molod

The article describes the design features of the universal values of the punch with the assessment of the specific pressure arising during formation of skins

Key words: forming, punch, deformation, precision, friction

IMPROVING THE QUALITY OF DIE TOOLING IN THE MANUFACTURE OF AIRCRAFT PARTS

V.I. Maksimenkov, M.V. Molod, Ju.A. Sidelnikova

The article describes the process of shaping parts of the cockpit with preliminary heating of the work piece. Revealed signs of rejection that occurs when shaping parts with heating. Developed method of increasing the resistance die of snap method of boriding providing the increase of hardness up to 2000HV and durability die 4 – 10 fold

Key words: baronacasino, stamp, vitality

TECHNIQUE FOR INCREASE OF ACCURACY AND RADIATION HARDNESS OF CMOS-SOI-ADC WITHOUT SWITCHED CAPACITORS FOR SPACE APPLICATIONS

V.S. Kononov

Basic mechanisms of CMOS-SOI-ADC degradation under impact of cosmic ionizing radiation are considered. A technique for increase of accuracy and radiation hardness of conversion in 12-bit CMOS-SOI-ADC without switched capacitors for space applications is described

Key words: ionizing radiation, ADC, CMOS-SOI

MODEL LDPC LOW POWER SCALABLE DECODER USING THE HIGH-LEVEL ALGORITHMIC SYNTHESIS

A.V. Bashkirov, L.N. Korotkov, M.V. Horoshaylova

This article provides a description and simulation of LDPC decoder scalable next-generation wireless network system-on-chip (SoC). The technique is based on the high-level synthesis: PICO (program-in chip-out) was used to obtain an effective RTL directly from the serial algorithm C. Proposed two parallel architecture LDPC-decoder: 1) decoding architecture with scalable parallel layers, and 2) a multi-layer conveyor decoding architecture to achieve higher throughput

Key words: encoding, RTL-code, LDPC -decoder decoding algorithm, the parity check matrix

ARCHITECTURES OF CMOS-SOI-ADC WITHOUT SWITCHED-CAPACITORS FOR SPACE APPLICATIONS

V.S. Kononov

Basic mechanisms of CMOS-ADC accuracy degradation are shown. Design of voltage reference hardened to cosmic rays impact is considered. Architectures of 1-GHz 1,8-V 8-18 bits CMOS-SOI-ADC without switched-capacitors are offered

Key words: ADC, CMOS-SOI, section, resolution, degradation

MICROSTRIP BEAMFORMING SCHEME FOR TELECOMMUNICATIONS NETWORKS BASED MULTIBEAM ANTENNA ARRAYS

A.V. Ostankov, N.N. Shchetinin, V.A. Melnik

The paper proposes and investigates microstrip implementation of a four-beam Butler matrix on the basis of electrodynamics simulation. The matrix circuit is formed using directional couplers of original topology and it does not contain cros-sovers. The absence of crossovers and the use of segments of artificial long lines for implementation of directional couplers made it possible to ensure relatively small losses in a matrix pattern, and relatively small size and footprint of a diagram on the dielectric substrate. The proposed matrix circuit has more than satisfactory electrical characteristics and it is intended for supply of phased array antennas in the ultrahigh frequency communication systems

Key words: antenna array, beamforming scheme, Butler matrix, directional couplers, amplitude-frequency characteristic

THE ANALYSIS OF ACID MODIFICATION OF ALUMOGEL INVOLVING METHODS OF ELECTROCHEMICAL RESEARCH

V.P. Gorshunova, V.A. Nebolsin

The results of study of influence of acid modification of alumogel on the process of sorption of ammonia are presented. Developed optimal mode of impregnation of the sorbent with an activating solution. Experimental results were confirmed by electrochemical research

Key words: adsorption, alumogel, acid modification, ammonia, electrochemical research

MOLECULAR-DYNAMICS SIMULATION OF VAN-DER-WAALS SYSTEM OF A NUCLEOTIDE CHAIN WITH GOLD NANOPARTICLES ON A CARBON NANOTUBE MATRIX

M.A. Khusenov, Kh.T. Kholmurodov

Studying of molecular systems as nucleotide chain (NC) – nanoparticles (NP) – carbon nanotube (CNT) represents a great interest for a wide spectrum of theoretical and applied problems, for example, in the development of the electronics diagnostic apparatus, in biochemical and biotechnological applications (nanorobotic design, facilities of drug delivery in a living cell, so on). In the present work using molecular dynamics (MD) simulation method the interaction process of a small NC with gold NP on a matrix from CNT was simulated. Hereby for the NC-NP-CNT system in the inter-atomic pair interactions the only presence of Van-der-Waals (VdW) forces were assumed. For the short-ranged VdW forces a pair wise Lennard-Jones (LJ) potential was employed. At the same time, for the CNT description a many body Tersoff potential that, generally, has a quantum-chemical nature was used. Thus, so-called hybrid MD approach was realized, where the quantum-chemistry potential in combination with classical Newtonian trajectory calculations was employed. We have performed a series of the MD calculations with different NC-NP-CNT models that were aimed on the investigation of the peculiarities of NC-NP interactions, the formation of bonds and structures in the system, as well as the dynamical behavior in an environment confined by the CNT matrix

Key words: nucleotide chain (NC), gold nanoparticles (NP), carbon nanotume (CNT), Van-der-Waals (VdW) interactions, molecular dynamics (MD)