

METHODS OF DECISION MAKING ON COUNTERACTION TO INFORMATIONAL THREATS TO VIRTUAL COMMUNITIES (p. 4-8)

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According to previous research, a method of decision-making on counteraction to information threats of virtual communities based on identifying the information threat index that uses the virtual community value was developed in the paper.

It proposes two approaches to determining the critical value of the virtual community for the information threat index, namely based on expert assessment of the number of virtual community participants, at which information threat is realized without taking into account the content quality and structure of relations in the virtual community; critical value of the virtual community relative to the total number of destructive and competing virtual community participants who are interested in this topic considering the content quality and structure of relations of discussions in these virtual communities.

To determine the threat information of the virtual community, a threat model was developed. According to the information threat indexes, recommendations for counteraction to information threats of the virtual community were provided.

Keywords: social networks, virtual communities, information threat, threat model, value, index.

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MONITORING ALGORITHM OF TWO-FACTOR AUTHENTICATION METHOD BASED ON PASSWINDOW SYSTEM (p. 9-16)

Sergey Evseev, Vugar Abdullayev

The paper deals with the basic methods of constructing a two-factor authentication system based on cryptographic mechanisms for ensuring the cryptographic security of the authenticators formed. Risk assessment of various methods of online attacks against various two-factor authentication systems is carried out. The PassWindow system, which provides two-factor authentication on the unique ability of the matrix particles to transmit information in a way that it is deciphered only when imposing the physical template of characters of the intended recipient and barcode template, obtained through electron-network devices of users is considered. Resistance to the analysis is provided by a unique generation of barcode template of the card as unique statistical images, a sequence of characters or a more extended animated version.

The object of the research is the process of improving the integrity and authenticity of data packets in security protocols of banking transactions based on two-factor authentication methods. The subject of the study are control methods and algorithms of the integrity and authenticity of data packets in security protocols of banking transactions based on two-factor authentication methods.

The aim is to increase the integrity and authenticity of data packets in security protocols of banking transactions, threat assessment of two-factor authentication methods. A comparative analysis of various two-factor authentication systems with the PassWindow system in withstanding various Internet attack scenario is performed.

Keywords: two-factor authentication, online attacks, social engineering.

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AN INFORMATION MODEL FOR EVALUATING, PREDICTING AND MANAGING THE QUALITY OF INDUSTRIAL PRODUCTS (p. 16-20)

Natalia Zubretskya

Structural formalization of evaluating, predicting and managing products quality has resulted in a devised information model that is presented as a closed loop within the quality management system of information and material flows between a normative, industrial and information modules that interact on the basis of evaluation and prediction. The model allows establishing relations between structural elements of products quality and its formation. It is a basis for information structure modeling as well as simulation of information support for making managerial decisions while designing, manufacturing and using industrial products.

We have modeled structural and parametric evaluation and prediction of products quality as a complex of interrelated resources and procedures aimed at obtaining more specific information and preventing products inconsistencies due to technologies of intelligent data analysis.

Keywords: information model, quality management system, evaluation and prediction.

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DEVELOPMENT OF DIAGNOSTIC ONTOLOGY MODEL OF DISTRIBUTED INFORMATION SYSTEMS BASED ON THE MANY-SORTED LANGUAGE OF APPLIED LOGIC (p. 21-26)

Petro Tishin, Oleksandr Makovetskiy

In constructing diagnostic systems of distributed information systems based on knowledge, the paper proposes an approach using the many-sorted language of applied logic. In developing intelligent systems for the diagnostics of distributed information systems, this allows to apply the concept of designing intelligent systems, all components (data, knowledge, problem solver with the user interface) of which have common principles for their formation, access and modification.

The developed model is based on the idea of distributed information system as the sets of services and sources of diagnostic information, which must be considered in the process of identifying the status of a service. Basic concepts introduced in the ontology framework allow to describe the subject area, taking into account operation features of services within the distributed information system, determine the knowledge depending on the dynamics periods of parameters, record a selected set of diagnostic parameters for a given failure cause and possible parameter values in the input periods.

Keywords: ontology, services, distributed information systems, many-sorted applied logic.

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BASIC FEATURES AND A MODEL OF UNIVERSITY UNITS: UNIVERSITY AS A SUBJECT OF INFORMATION ACTIVITY (p. 27-34)

Andriy Peleshchyn, Roman Korzh

A university has a complex organizational structure, which is reflected in all aspects of information activity. Therefore, the paper identifies and largely describes the stages of processing the information obtained through the generator of information content that forms the university information image, namely: the information potential, information resource, and an element of the information image.

We have identified and described the groups of special characteristics of university units, such as: organizational and administrative characteristics, social communication features, topics and content features, as well as indicators of the volume and intensity of information potential and image. The groups are basic, important and primary data on university units in the context of arranging the information activity of a university. The information volume and intensity indicators facilitate determining the synthetic indicators of completeness of both unit filing and information activity in the internet social media. The organizational and administrative characteristics are also a basis for determining a complex indicator of a university unit integration. Therefore, a formal description of a university as an organizational structure is an integral part of research on the information activity.

Keywords: institution of higher education/university, information activity, information potential.

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IDENTIFICATION OF TARGET SYSTEM OPERATIONS. DEVELOPMENT OF GLOBAL EFFICIENCY CRITERION OF TARGET OPERATIONS (p. 35-40)

Igor Lutsenko

Guaranteed maximization of financial returns from economic structures is only possible if all of its systems are focused on selecting target operations with maximum efficiency. Is it possible?

Any system is created to enhance the value of output products of the system operation. Thus, two products: a consumer product that has value to the customer and the target product (value added), rewarding manufacturer of consumer value are formed at the output of the managed system.

If the management system has degrees of freedom, obtaining a consumer product with desired quality characteristics can be achieved with various management modes, each corresponding to their costs, results and operation time. All that is

necessary is to be able to evaluate the efficiency of the operation based on its basic indicators, available for any operation.

Efficiency formula, which can be used to assess any target operation, including with distributed parameters was obtained. In this case, it is necessary to use numerical methods.

As applied to the model of the simple operation, efficiency formula is extremely simple. To use it, it is necessary to get only three parameters from the system under study: the cost estimate of input products of the operation, the cost estimate of output products of the operation and the operation time.

Since these basic indicators are available in absolutely any system, they can all be oriented to achieve the global goal – the maximum resource efficiency.

Keywords: effect, efficiency, resource efficiency, efficiency criterion, efficiency formula, optimization criterion.

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THE RESEARCH OF TRANSIENTS OF THE FOURTH-ORDER AUTOMATIC CONTROL SYSTEMS BY THE QUADRATURE METHOD (p. 41-49)

Josef Stencel, Elena Prokaza, Konstantin Litvinov

Modern transient analysis methods are approximate, which leads to significant control errors. It is shown that improving the accuracy and speed of automatic control systems, and providing optimal operation is possible using the quadrature method for the transient analysis. The fourth-order automatic control system, which is described by a linear differential equation with real and compatible complex roots was investigated. The influence of these roots on the first-quadrature time constants is shown. The methods for determining the first-quadrature time constants and transient analysis accuracy were described. The time constant, which is a multiplier at the first derivative of the first quadrature can be determined by the minimum space between the real RFR of the system and RFR of the first quadrature. The second quadrature can be determined by the difference between the real RFR and RFR, identified by the first quadrature. It is shown that for the fourth-order ACS, transition frequency of the second quadrature RFR is equal to the first quadrature frequency. Since the second quadrature is negligible, it can be neglected in many practical tasks. The main

advantage of the quadrature method is the transient analysis using analytical formulas, used for second-order differential equations. Using the quadrature method is especially valuable for the software support of modern computer-integrated process control systems, in which close and complex method of inverse Laplace transform is typically used. Investigating the high-order control systems with delay and using the method for calculating the optimal regulator settings are practically important.

Keywords: method, transient, system, control, quadrature, equation, accuracy, speed.

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MODELING OF POWDER MATERIALS BALLING DRUMS AND DISKS CONTROL SYSTEM (p. 49-54)

Victoria Rakhuba

Mathematical models of powder material balling in drums and disks based on the balance method are developed. The models describe relation of polydisperse mixture fractions contents and fractions mass transfer rate. Development of the models answers the challenge of precise process control organizing since it creates theoretical foundation of the units work control algorithms.

Structure schemes of granulators control systems with usage of the models proposed are designed. The systems use unit angle declination and spin rate as control effects and stabilize moisture flow rate on the level answering technological demands of the firing and sintering processes. This control method allows affecting only material granulometric composition and not changing its physical and chemical features.

The systems proposed work simulation is done. Its results show that usage of the systems will provide material granulometric composition stabilizing. It will lead to fuel consumption

reduction for sintering process and good agglomerate producing increase. These results are interesting in terms of energy and resources economy that is actual for present-day state of Ukrainian metallurgy.

Keywords: balling, iron ore mixture, automated control system, mathematical model, balance method.

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CONTROL OF GRINDING THE MANDREL WORKING SURFACE OF COLD-ROLLING MILLS (p. 55-63)

Yuriy Petrakov, Sergey Chamata

It was found that for maximum performance of grinding the mandrel working surface of cold rolling mills at fulfilling all quality requirements for the machined surface, a graph of the material removal rate (MaterialRemovalRate) throughout the grinding cycle must be located in the region of acceptability, which is limited by the marginal algorithm as close to the boundaries of this region as possible. A problem of determining the material removal rate in grinding the curved surface of the mandrel by the torus-shaped grinding wheel can be solved only by a numerical method using the developed application.

To clarify and adapt the cutting process control law to actual conditions, conducting experimental studies to determine the

parameters which cause the marginal algorithm restrictions for grinding the mandrel working surface according to the developed methodology is necessary.

Automated design of the cutting mode control when grinding the cold rolling mill mandrel is fully provided by the developed CAM system that has been introduced at Nikopol Pipe Plant of JSC "Centravis Production Ukraine" (Ukraine), where its effectiveness in preparing control programs for grinding a wide range of mandrels with the curved component on the modernized CNC grinding machine was fully confirmed.

Keywords: grinding, cold rolling mill mandrel, marginal control algorithm.

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RESEARCH OF QUESTIONS OF CONTROL AUTOMATION OF THE CITY DISTRICT HEATING SYSTEM WITH THE OBJECT STRUCTURE OPTIMIZATION (p. 64-68)

Maksym Maksymov, Sergey Babich

The paper proposes a new solution to the problem which lies in improving the methods and models for automatic control of the city district heating system to increase economic efficiency by target change of the control object structure.

The analysis of the control object, methods and models used in the heating control of the city and districts was performed. Simulation models of the control object, which operate in the presence of alternative energy flows, differing in cost were developed. Optimization criteria and objective function of the city district heating were synthesized and justified. The heating optimization problem of districts by switching from the structural control object optimization to the price structure control of energy flows, proposed to the consumer was solved. Computer-integrated control systems and control of the proposed objects was practically implemented in order to assess their effectiveness.

Keywords: control object, simulation model, objective function, city district heating, heating networks.

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